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Identification of Active Compounds of Ethanol Extract of *Citrus amblycarpa* leaves by Analysis of Thin-layer Chromatography and Gas Chromatography-Mass Spectrometry as Bioinsecticide Candidates for Mosquitoes

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Abstract

BACKGROUND: The use of active compounds from plants becomes an alternative to control mosquitoes nowadays and in the future because they are environmentally-friendly and do not cause health problems. *Citrus amblycarpa* is a local orange of South Kalimantan potential as bioinsecticidal, which commonly used for controlling mosquitoes. Therefore, research needs to be done to find out the benefits of *C. amblycarpa* leaves as bioinsecticidal.

AIM: The research aimed to identify active compounds contained in the extract ethanol of *C. amblycarpa* leaves as bioinsecticidal against mosquitoes.

RESULTS: Based on thin-layer chromatography test, there were some secondary metabolite compounds found such as terpenoids/steroids, flavonoids, polyphenols, and saponins. Gas chromatography-mass spectrometry (GC-MS) test revealed that there were ten primary components of the fraction. The components were Maragenin I (18,82%), 1,3-benzenedicarboxamide (12.28%), 2,3,8-trioxocephalotaxane (10.39%), aristolone, 2H-cyclopropa[a] naphthalene-2-one, noruns-12-ene (7.46%), palmitic acid, n-hexadecanoic acid (7.21%), stigmasterol, demecolcine (7.03%), alpha-tocopherol (5.88%), 2,4,5-trimethylphenol, pseudocumenol (4.21%), germacrene-D (3.45%), and 9-octadecenoic acid (3.36%).

CONCLUSION: These active compounds possess biological activity as bioinsecticidal. It was expected that those active compounds in *C. amblycarpa* leaves could be applied for controlling mosquitoes by replacing the use of resistant temephos.

Introduction

Dengue fever, both in tropical and sub-tropical, is a disease [1], [2] transmitted through the bites of *Aedes aegypti* or *Aedes albopictus* and caused by Dengue virus [3], [4]. South Kalimantan is a province which belongs to dengue fever endemic where 13 cities/regencies have been affected by the diseases [5]. A report from Health Agency of South Kalimantan Province showed that there are 1079 cases of dengue fever with 33 people died over 2013. In 2014, there are 363 cases of dengue fever with eight people died (incidence rate/1000 people is 1103), while in 2015 there is a significant increase in the incidence of dengue fever reaching 1.216 cases with 19 people died. The highest case occurs in Banjarmasin, Banjarbaru, and Banjar Regency [6]. The fluctuated condition of dengue fever incidence encourages a need to control *A. aegypti*. One of the methods to break the cycles and kill mosquitos' larvae is using insecticides [7].

The constant use of synthetic insecticides (temephos/abate, malathion, cypermethrin, lambda siihalothrin, and deltamethrin) on mosquitoes vector causes resistance, bioactive characteristics which are harmful for the environment, toxic substances, in the insecticides will have adverse impact on human health. Plant-based insecticides become an alternative to control mosquitoes using more environmentally friendly plants to suppress the use of synthetic insecticides and anticipate negative impacts on health [8].

In Indonesia, there are around 2.400 species of plants potential for bioinsecticides [9]. One of the local plants and abundant in South Kalimantan and contains active compounds to be used for bioinsecticides

against *A. aegypti* is *Citrus amblycarpa*. The plants contain several active secondary metabolites such as flavonoids, tannins, saponins, and alkaloids [10]. The extracted fresh peel of *C. amblycarpa* is proven to be lethal for *A. aegypti* third larval instars within 7 h in all concentrations [11]. The aim of the study was to identify and analyze chemical components of *C. amblycarpa* and its potential as bioinsecticides against *A. aegypti*.

Materials and Methods

The study was an experimental laboratory conducted in the Laboratory of Entomology and Protozoology, Department of Parasitology, Faculty of Veterinary, Airlangga University. Extraction, isolation, and analysis of chemical compounds were carried out in the Laboratory of Faculty of veterinary, Airlangga University. Around 2.5 kg fresh samples of Limau Kuit leaves were collected from Kaliukan Village, Astambul, Banjar Regency, and South Kalimantan. Several materials used for extraction, isolation, and identification were ethyl-alcohol p.a. (E. Merck), technical ethanol, and aquadest. A set of maceration, rotary evaporator, pipette, test tube, evaporating dish, analytical balance, vial bottle, micropipette, falcon tube, Erlenmeyer glass, capillary pipe, drop plate porcelain, UV lighting (ƛ = 245 nm), chromatography chamber, thin-layer chromatography (TLC), chromatography column, test pipette heater, electrical stove, 20 W fluorescent bulb, and a set of gas chromatography–mass spectrometry (GC-MS).

The samples of *C. amblycarpa* leaves were sorted and cleaned by washing the leaves using clean water, drained and distributed on the paper to reduce the water content. After that, 2.5 kg of samples were dried weight, aired for 7 days by putting the samples in the shade places. The samples were then mashed to generate powder. 1 kg of simplisia was macerated using ethyl alcohol solvent for 3 days. Filtration was conducted every day and the filtrates were collected and steamed using rotary evaporator to generate 52 g extracted dry leaves of *C. amblycarpa*. Phytochemical screening of extract ethyl alcohol and the most active fractions include alkaloids, flavonoids, saponins, phenolics, triterpenoids, quinones, and terpenoids and steroids. TLC analysis on the collected extract was run with mobile phase, a combination of ethyl alcohol p.a with various comparisons, and silent phase used silica gel of 60 GF25. The composition of the best TLC was then employed as a mobile phase in collected extract of chromatography column. Silent phase in the chromatography column was 60 G silica gel. Extract of Limau Kuit leaves and fractions of chromatography column were tested for their activities using BSLT method. The solution making for activity tests was carried out with 3 times replications.

Fraction LC_{50} was used because it was the most active fraction. The fraction was then analyzed its components using Agilent 6980N Network GC system, detector Agilent 5973 inert MSD. Around 1 μL sample was injected to GC-MS operated using glass column for 30 m, diameter of 0.25 mm, and thickness of 0.25 μm. Oven temperature was 50°C (5 min), 10°C/min, and 280°C (15 min). Flow in the column was 1 ml/min (constant), Wiley Reference of version 7.0. The method was employed to identify a compound, either one or mixed components [12]. Precise spectrometry mass was employed to determine fragmentation and molecules and also to identify components contained in small amounts [13].

Results

Screening of phytochemical of *C. amblycarpa* results of the study showed that there were some compounds of secondary metabolites such as free terpenoid/steroid, flavonoid, polyphenol, and saponin. The identification result of chemical compounds of *C. amblycarpa* leaves is presented in Table 1 and Figure 1.

Table 1 shows positive test result in free terpenoids/steroids, flavonoids, polyphenols, and saponins but shows negative test in alkaloids.

Analysis of GC-MS of C. amblycarpa leaves extracted using ethanol

The samples were analyzed using GC-MS Agilent 6980 N Network GC System, detector Agilent 5973 inert MSD. Chromatogram of *C. amblycarpa* leaves is presented in Figure 2, while the chemical components are shown in Table 2.

Table 2 shows that there are ten main components of fraction obtained from GC-MS analysis. The components are Maragenin (18.82%), 1,3-benzenedicarboxamide (12.28%), 2,3,8-trioxocephalotaxane (10.39%), aristolone, 2H-cyclopropa[a] naphtalen-2-one, noruns-12-ene (7.46%), palmitic acid, n-hexadecanoic acid (7.21%),

Table 1: Screening of phytochemical of *Citrus amblycarpa* leaves extracted using ethanol

Phytochemical test	Reagent	Staining appearance	Result
Alkaloids	Dragendorff	Orange	−
Free Terpenoids/Steroids	Sulfate acid anisaldehyde	Red purple or purple	+
Flavonoids	Ammonia evaporation	Intensive yellow	+
Polyphenols	2% $FeCl_3$	Brown to black	+
Saponins	a drop of 2N HCl	Stabile foam for more than 30 min	+

+: Contain chemical compound, −: No chemical compound

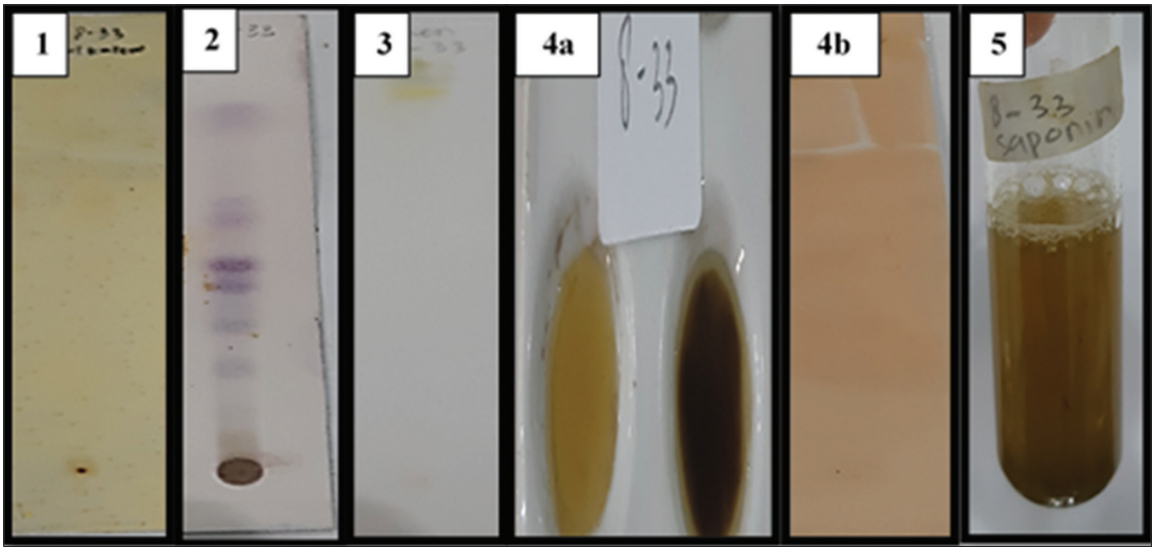


Figure 1: (1) Samples do not show orange spot (contain negative [−] alkaloids), (2) purple spot (contain positive (+) terpenoids/free steroids), (3) intensive yellow spot (contain positive (+) flavonoids), (4a) based on Ferric chloride test, samples display black-blue green spot (contain positive (+) polyphenols), (4b) based on KLT test, samples show blackish spot (contain positive (+) polyphenols), and (5) based on foam test, the foam can last for 30 min (contain positive (+) saponins)

stigmasterol, demecolcine (7.03%), alpha-tocopherol (5.88%), 2,4,5-trimethylphenol, pseudocumenol (4.21%), germacrene-D (3.45%), and 9-octadecenoic acid (3.36%).

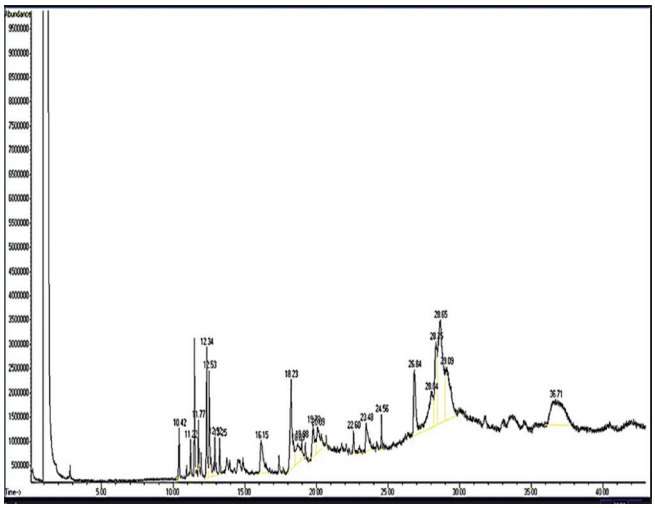


Figure 2: Chromatogram of Limau Kuit (Citrus amblycarpa) leaves extracted using ethanol, analyzed using gas chromatography-mass spectrometry

Discussion

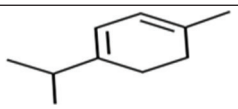
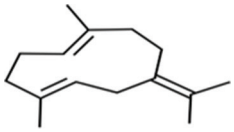
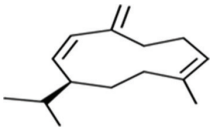
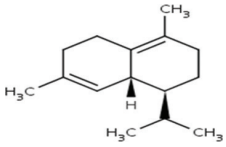
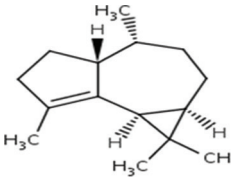
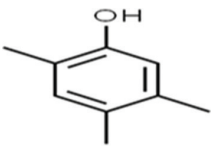
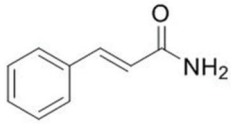
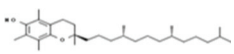
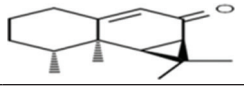
Indonesia possesses a wide variety of local plants potential for biopesticidal [14]. In the present study, we are interested in *C. amblycarpa* because the plant is a local orange and abundant from South Kalimantan. Moreover, it could also be plant-based insecticides. The plant contains secondary metabolite compounds such as alkaloids, saponins, tannins, and flavonoids [10]. Principally, plant cells contain primary and secondary metabolites. Primary metabolites are carbohydrate, amino acids, lipids, and vitamins, while secondary metabolites are a source for pharmaceuticals, food additives, perfume ingredients, or pesticides [15]. The secondary metabolite compounds are a relatively safe insecticidal to environment and human health because it possesses insufficient risks [16].

The purpose of the study was to identify and analyses the chemical content of *C. amblycarpa* leaves using TLC and GC-MS analysis, and also to examine its potency as bioinsecticidal. The active compounds such as alkaloids, terpenoids, flavonoids, and polyphenols in the extract were determined using color reagent, while saponins compounds were tested by foam test. The results showed that extract ethanol of the leaves showed positive test on terpenoids/steroids, flavonoids, polyphenols, and saponins compounds, but showed negative result on alkaloids compounds (Table 1). Ghosh reported that steroids, sitosterols, and stigmasterols compounds are found in maja leaves and possess larvicidal activity for *A. aegypti*, *A. stephens*i and *C. quinquefasciatus* larvae [17]. Steroids are toxic to nerve cells affecting neurotransmission function and inhibiting ion transports making mosquitoes limp and death [18].

Flavonoids contained in the plant affects the respiration of mosquitoes. The compound gets into the nerve cells along with the air through respiratory organs decreasing the amount of oxygen. As a result, the mosquitoes suffer from nervous and spiracle disruptions and then death [19]. Plants containing flavonoids compounds have toxic effect on *Anopheles* and *A. aegypti* larvae, indicated by the loss of chitin layer and abnormal body stretching [20].

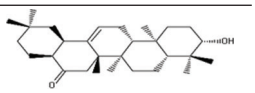
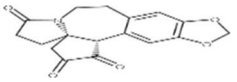
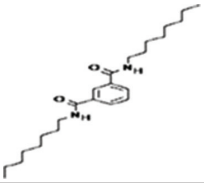
The results of chromatogram and analysis of GC-MS extract ethanol of *C. amblycarpa* leaves showed 22 compounds with ten primary components of

Table 2: Chemical components of *Citrus amblycarpa* leaves extracted using ethanol and analyzed using GC-MS

Peak	Retention time (min)	Area (%)	Chemical formula	Compound name	Biological activities	Chemical structure
1	10.42	1.46	$C_{10}H_{16}$	Alpha-terpinene	Potential larvicides and mosquito Repellent[14]	
2	11.22	0.99	$C_{15}H_{24}$	2-Methylene-4,8.8 trimethyl-4-vinyl-Bicyclo [5.2.0] nonane, Beta-Elemene	Potential Insecticide of *Aedes aegypti*[15]	
3	11.78	0.91	$C_{15}H_{24}$	Gamma elemene, Germacrene-B	Potential Insecticide of *Aedes aegypti*[15]	
4	12.34	3.45	$C_{15}H_{24}$	Germacrene-D	Toxic to *Anopheles subpictus, Aedes albopictus* and *Culex tritaeniorhynchus* larvae[16], Potential insecticides[17]	
5	12.53	3.13	$C_{15}H_{24}$	Lepidozene	Mosquito Repellent *Aedes aegypti*[18]	
6	12.92	1.66	$C_{15}H_{24}$	Delta-cadinene, beta.-cadinene	Potential insecticides[19], Anti feedant[20]	
7	13.25	0.91	$C_{15}H_{24}$	Alpha-Gurjunene,. beta.-Neoclovene	Activity of larvicides of *Aedes aegypti*[21], mosquito repellent[22]	
8	16.16	4.21	$C_9H_{12}O$	4-Hydrazinopyrazino [3,2-D] Pyrimidine,-2,4,5 Trimethylphenol, Pseudocumenol	Potential insecticides[23]	
9 10	18.23 18.70	7.21 2.95	$C_{16}H_{32}O_2$	Palmitic acid, n-Hexadecanoic acid Palmitic acid, n-Hexadecanoic acid	Possess biolarvicides effect on *Aedes aegypti*, *Culex* sp., and *Anopheles sundaicus* larvae.[24] Activity of insecticides on *Aedes aegypti*.[25]	
11 12 13	18.98 19.78 20.09	0.81 2.65 3.36	$C_{18}H_{34}O_2$	9-Octadecenoic acid 9-Octadecenoic acid 9-Octadecenoic acid	Lethal to *Aedes aegypti* and *Culex pipiens* pallens larvae[26]	
14	22.60	0.77	$C_{34}H_{58}O_4$	Dioctyl ester, 1-2 Benzenedicarboxylic acid	Activity of larvicides vector of *Aedes aegypti*[27]	
15	23.48	2.87	C_9H_9NO	Cinnamamide	Potential insecticides and antifungal,[28] Repellent[29]	
16	24.56	0.80	$C_{15}H_{28}O$	Dihydrofarnesol,-dodecatrienol	Antioxidant, antifungal, antibacterial[30]	
17	26.84	5.88	$C_{29}H_{50}O_2$	Alpha-tocopherol, Vitamin E	Antioksidant[31]	
18	28.04	7.03	$C_{29}H_{48}O$	Stigmasterol, Demecolcine	Potential Insecticides[32,33]	
19	28.35	7.46	$C_{15}H_{22}O$	Aristolone, 2H-Cyclopropa[a] naphtalen-2-one, Noruns-12-ene	Potential Insecticides[34]	

(*Contd...*)

Table 2: (*Continued*)

Peak	Retention time (min)	Area (%)	Chemical formula	Compound name	Biological activities	Chemical structure
20	28.65	18.82	$C_{29}H_{46}O_2$	Maragenin I	Potential Insecticides[35]	
21	29.09	10.39	$C_{20}H_{36}$	2,3,8-Trioxocephalotaxane	Potential Insecticides[36]	
22	36.71	12.28	$C_{24}H_{40}N_2O_2$	1,3-Benzenedicarboxamide	Potential Insecticides[37]	

GC-MS: Gas chromatography-mass spectrometry.

the fraction. *Maragenin* I is a main compound with the highest component found in the leaves. Maragenin I is a derivate of triterpenoid [21]. Literature study has been done, *Maragenin I* compound is found to be antiviral [22], anti-microbe, and antioxidant [23]. The compound is able to control the growth of insects and potential as insecticides [24]. It is a derivative of triterpenoid/steroid. Therefore, it is concluded that the compound is potent to be used as biopesticides, and poisonous to *A. aegypti*.

The compound is able to kill *A. aegypti* to 90%. *Stigmasterol* is the main sterol of plasma membrane in the cell of plants [25]. Sterols, in plants known as phytosterol and belongs to the group of alcohol steroids, are natural phytochemical exclusively found in plants. The compound is alcohol soluble. Stigmasterols are present in various medical plants and it has been reported that the compounds inhibit the activity of acetyl cholinesterase making them possessing larvicidal effect. Moreover, stigmasterols are one of active compounds which contribute to insecticidal [26]. It is potential to prevent insects and to be developed for botanical biopesticides.

D-alpha-tocopherol (Vitamin E) is fat-soluble compound and the main antioxidant for cells. This compound contains highest antioxidant activity of all tocopherols [27]. *Trimethylphenol* compound is found in the extract of *Artemia salina* flowers with cytotoxic that can be used for pesticides. Germacrene-D is a compound belonging to sesku terpenoid hydrocarbon group [28]. This compound has been reported poisonous to *Anopheles subpictus*, *Aedes albopictus*, and *Culex tritaeniorhynchus* larvae. Germacrene-D compound causes typical biological activities such as toxic which inhibits food, antiparasitic, and pesticides.

9-Octadecenoic acid, also known as oleat acid, is a compound from fatty acid. Compounds from lipid acids are benefit to prevent pests. The acid can be lethal to *A. aegypti* and *Culex pipiens* pallens larvae. 9-Octadecenoic acid is also an active principle compound obtained from the extract of *Annona glabra*. It is also poisonous that work quickly if applied manually and serves as ingested and contact insecticides. Thus, it affects mortality rate for *Eurema* sp. larvae [29], [30], [31], [32].

Conclusion

C. amblycarpa leaves contain active chemicals such as free terpenoids/steroids, flavonoids, poliyphenols, and saponins potential as bioinsecticides. The analysis of GC-MS showed that the main components of fraction were maragenin I, 1,3-benzenedicarboxamide, 2,3,8-trioxocephalotaxane, aristolone, 2H-cyclopropa[a] naphtalen-2-one, noruns-12-ene, palmitic acid, n-hexadecanoic acid, stigmasterol, demecolcine, alpha-tocopherol, 2,4,5-trimethylphenol, pseudocumenol, and germacrene-D. The active compounds of the leaves could be an alternative to control mosquitoes in the future by replacing the use of resistant *temephos*.

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Workplace Stretching Exercise toward Reduction Job Burnout among Workers Pt. X International, Indonesia

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Abstract

BACKGROUND: Occupational safety and health are health sciences that are applied through work and the work environment to obtain the highest degree of health both physically, mentally, and socially through preventive and curative efforts in the workplace. The emergence of work fatigue in workers is evidence of a decrease in bodily functions caused by both individual factors and the work environment so that precautions are needed.

AIM: This study aimed to see the effect of workplace stretching exercise on work fatigue in workers at PT. X International, Indonesia.

METHODS: This study used a quasi-experimental study with one group pre-test and post-test design. Respondents were 30 people selected by purposive sampling and met the study inclusion criteria. The provision of workplace stretching exercises was carried out for 15 working days and is given every 10 am after workers work for 2 h.

RESULTS: The mean of work fatigue before intervention (pre-test) is 454.8133 and the average work fatigue after an intervention (post-test) is 321.9133 so that there are differences in the average work fatigue before and after the intervention.

CONCLUSION: Workplace stretching exercise intervention affects reducing work fatigue in production workers of PT. X International Indonesia.

Introduction

An occupational illness is a disease that arises due to occupational factors (environment and work tools). According to the World Health Organization, about 50% of the global population are workers, with reports from the International Labor Organization (ILO) that there are at least 2.34 million cases of deaths caused by accidents or work-related diseases [1]. Meanwhile, 160 million workers suffer from occupational diseases with non-fatal work. Losses due to occupational illnesses and deaths due to occupational factors account for 4%-6% of the gross domestic product in related countries and regions in the world [2].

Work fatigue is one of the risk factors for the decrease in the health status of workers, which can also be measured by increasing the pulse rate [3], whereas workers who experience integrated health improvement are proven to increase work productivity [4]. The development of muscle fatigue is usually quantified as a decrease in muscle power capacity [5]. Fatigue felt by workers varies, among others, feeling sleepy, dizzy, bored, palpitations, and lazy to move. Things that cause work fatigue could come from work environment factors (work intensity, work climate, lighting, noise, etc.) and individual factors [6].

Based on the survey results, residents of developed countries are identified as having work fatigue of around 10-50%. Then, data released by the ILO in 2010 showed that around 2 million workers die every year because work accidents are preceded by work fatigue. A study conducted in New Zealand from 2002 to 2004 reported that there were at least 134 work accident cases where 11% were caused by risk factors for work fatigue [7].

PT. X International, Indonesia, is one of the largest wood processing companies in Makassar city, whose main products are furniture for storing the ashes for Japanese people called Butsudan. This company has four factories which are still operating today. At factory 1, cutting or woodcutting process, factory 2 sanding wood, factory 3 painting, and factory 4 assembly and packing, there were also wood drying machines,

boilers, several wood warehouses, and 2 offices. The long production process requires that the company has a stretching program or workplace stretching exercise to give the company a break and stretch the muscles of the workers.

The selection of factory 2 as a place of research is because homogeneous forms of work carried out by workers are sanding cut wood. Besides, the number of factory 2 workers is the highest compared to other factories. The length of the wood processing process to become butsudan and the target of the sandpaper that must be achieved requires them to do work from 8 to 12 noon without any break for workplace stretching exercise. Based on the results of previous studies it was published that the percentage of work fatigue of 58.5% experienced by workers at PT. X International Indonesia [8]. Based on this study, this study aims to see whether workplace stretching exercises can reduce work fatigue in factory workers 2 PT. X International Indonesia.

Materials and Methods

This research was conducted at PT. X International Indonesia, Makassar City, South Sulawesi. The type of research was a quasi-experiment with one group pre-test and post-test design.

The population in this study was factory workers 2 PT. X International Indonesia, sample 30 respondents who were selected by purposive sampling and met the inclusion criteria, namely, men, working period of at least 1 year, experiencing work exhaustion, and willing to follow the research by signing informed consent.

Data collection was carried out by researchers using questionnaires, digital reaction timers, analog scales, and stature meters. Measurement of work fatigue is done twice, namely, before giving workplace stretching exercise intervention and after giving workplace stretching exercise. The provision of workplace stretching exercises is given for 15 days and every 10 am.

Data on individual factors in this study include (age, years of service, body mass index, smoking status, and exercise habits) and work fatigue before and after workplace stretching exercise intervention using SPSS for windows 23. The average difference in work fatigue before and after the intervention is used analysis paired sample t-test.

Results

Table 1 showed that the average age of research respondents at factory 2 PT. X International Indonesia, 38.67 years and the average respondent have work period 14 years. The mean body mass index of the respondent is 25.1. Meanwhile, the category of smoking habits of respondents 90% had smoked the past year and 10% had never smoked the past year. Then, the exercise habits category showed that 26.7% had exercise habits and 73.3% had exercise habits. Category of body mass index showed that as much as 56.7% of workers have normal BMI, 30% overweight, and 13.3% obesity category.

Table 1: Characteristic respondents

Characteristic	%	Mean	Standard deviation
Age	100	38.7	7.7
Working periods	100	14.07	6.2
Sports habits			
Ordinary	26.7		
Unusual	73.3		
Smoking status			
Smoke	90.0		
Do not smoke	10.0		
BMI			
Normal	56.7	25.1	2.8
Overweight	30.0		
Obesity	13.3		

BMI: Body mass index

Table 2 showed that category of work fatigue before giving workplace stretching exercise intervention was the most in the moderate category by 46.7%, mild category 33.3%, and the severe by 20%. Then, after being given intervention workplace stretching exercises mild category 93% and moderate category 6.7%.

Table 2: Distribution by category of work fatigue in workers

Category of work fatigue	Measurement of work fatigue			
	Pre-test		Post-test	
	n	%	n	%
Normal	0	0	0	0
Mild	10	33.3	28	93.3
Moderate	14	46.7	2	6.7
Severe	6	20.0	0	0

Table 3 showed that there was a change in the average work fatigue before and after the workplace, stretching exercise intervention. The average work fatigue before the intervention was 454.8 and after work intervention was 321.9. Then, the results of paired sample T-test analysis resulted in sig. 0.001 <0.05 which means that there were differences in the average work fatigue before and after the workplace stretching exercise intervention in factory workers PT. X Internasional, Indonesia.

Table 3: Paired sample t-test analysis

Work fatigue	Mean	Mean	Standard deviation	Sig.
Pre-test	454.8	132.9	68.2	0.001
Post-test	321.9			

Discussion

Studies show that at least 46.7% of workers experience fatigue in the moderate category and 20.0% for fatigue in the severe category, after giving interventions perceived level of fatigue is dominant in the mild category or 93.3%. This change is supported by results of the significance test that

there are differences in the average work fatigue before and after the workplace, stretching exercise intervention in factory workers PT. X Internasional, Indonesia.

Fatigue and drowsiness in the workplace are consequences of modern industrial society, which can cause many accidents and poor mental and physical health outcomes, mostly due to work in high demand, long service periods, and circadian rhythm disturbances, to accumulative sleep debt common in many industries [9], [10]. According to Krausman *et al*. [11], fatigue can also be caused by intense cognitive activity on physical demands.

The effect of muscle fatigue is most likely explained by the composition of the type of muscle fibers, where absolute strength is higher when young and generally higher for men [12]. Age is one of the individual factors that can cause work fatigue in workers, which is associated with changes in physiology in a person's body and affects physical endurance and capacity as well as productivity [13]. This is in line with research conducted by Budiman *et al*. [14] that increasing the age of a worker will also increase the level of fatigue due to a decrease in mental and social functional capacity before the age of 45 years. An interesting thing resulted from research conducted by Amin *et al*. [15] that the peak of human physical capacity is when they enter the age of 25 years. And will experience a decrease in muscle strength, sensory ability, decreased visual acuity, speed to distinguish things, and the ability to remember long-term at the age of 50–60 years.

The influence of work tenure on work fatigue so far has not been proven clearly because there are still studies that explain that work tenure is not related to work fatigue. The same thing is explained in the research of Salasa *et al*. [16] that there is no relationship between work period with work fatigue in Loining workers at PT. X Foods International, where the longer the work period, the more skilled a worker will be the average tenure at factory 2 PT. X International is 14 years or it could be said that workers have a long work period and have directed habits.

Good nutrition in the workforce will increase the degree of worker's health, efficiency, work productivity, maintain endurance, balance the nutritional, and calorie needs of the work done. Body mass index is one of the factors causing work fatigue in workers because, with good nutritional status, a worker will have a better work capacity and endurance compared to workers who have less nutritional status [17]. This is supported by the study of Langgar *et al*. [18] that there is a relationship between the nutritional statuses of workers with work fatigue experienced by workers from the company Tahu Baxo Bu Pudji on the Ungaran. Besides, nutrition for workers can also maintain the body, repair tissue cells so that a person can do his job well. Research conducted by Diana *et al*. [19] showed that workers with underweight nutritional status have poor capacity and endurance compared to workers with normal nutritional status. Thus, these workers need food as a source of energy, protein, vitamins, and minerals. The substance is then burned in the body and then used as a source of energy for work.

Workplace stretching exercise is a workout stretching exercise adopted from the Toronto University and its movements are designed according to the principle of stretching the muscles which aim to extend the muscles, so they become relaxed and supple. Some of the benefits of stretching in the workplace are improving circulation, improving work posture, improving coordination, relieving stress, increasing flexibility, wiggle room [20], and preventing injury [21].

Work fatigue is a common problem that often experienced by the working population and usually appears after work and is acute or chronic. Work fatigue occurs due to a decrease in physical and cognitive functioning of the body [22]. In addition, work fatigue can also be caused by factors outside the work environment such as activities at home before going to the office/workplace, lifestyle, and nutrition/food intake at home. The effects of fatigue on workers can be in the form of disability and absenteeism [23]. More clearly stated by Prof. Meijman that work fatigue is an effect of physiological adaptation that can save the body from the risk of excessive energy released by the body, in contrast to physiological fatigue which is feedback from the body that causes reduced drive and motivation and causes mental and physical [24].

Paired sample t-test results showed that there were differences in the average work fatigue before and after the administration of workplace stretching exercise intervention. This happens because this intervention provides an opportunity for muscle relaxation or rest to prevent muscle tension. Besides, if the workplace stretching exercise is used as a routine, it will also affect the complaints of musculoskeletal disorders. This is consistent with research conducted by Hastuti [25] which states that there is a decrease in work fatigue after giving stretches to workers. Various relevant studies prove the positive influence of stretching on decreasing the level of fatigue [26], [27], [28]. Theory of conservation of resources states that every individual will try to get and maintain the things they value to avoid work stress. Besides, another way to deal with work fatigue is to do relaxation and physiological release at work [29], [30], [31], [32].

Conclusion

Workplace stretching exercise intervention affects reducing work fatigue in production workers of PT. X International Indonesia.

Recommendation

It is expected that top management can make policies related to the provision of workplace stretching exercise interventions to workers in the industry so that the level of fatigue in workers can be minimized, which has a positive impact on results and increased productivity.

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Impact Evaluation of Healthy City Implementation in Makassar City

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Abstracts

BACKGROUND: Healthy city is one of the health development strategies in Indonesia that has been started since 2007. Implementation of healthy city in Makassar has entered its 12th year.

AIM: This study aimed to evaluate the impact of the implementation of healthy cities based on aspects of the level of involvement.

METOHDS: This research method uses a qualitative design with a phenomenological approach where research departs from phenomena found in the field and then is developed in depth. Informants in this study were 13 people. Data collection techniques are in-depth interviews and documentation.

RESULTS: The results showed that the involvement of women in the implementation of healthy cities in Makassar was shown from the large number of female workers who were directly involved in various programs launched by the city government related to healthy cities. In addition, many women play an important role by being the head of a healthy subdistrict program in nine subdistricts in the city of Makassar. Whereas the political commitment indicator shows the results that the Makassar city government's political commitment to the implementation of the healthy city is seen from the achievement of the Makassar city government which has succeeded in getting the highest award in the healthy city, Swasti Saba Wistara 4 times since 2007. After interviews and document review, the evaluation of the impact of the implementation of healthy cities based on women's involvement and political commitment of the government shows quite good and significant results since the implementation of healthy cities.

CONCLUSION: However, coordination at the government level is expected to be further improved, because there is still frequent miss communication between several Satuan Kerja Pemerintah Daerah in the implementation of tasks to achieve healthy city indicators.

Introduction

Cities play an important role in the social fabric of the country and national and regional economies throughout the world. In theory and public opinion, the city offers opportunities for education, employment, services, and cultural enrichment and hopes for better health. In fact, these opportunities may not be as busy as expected [1].

The city growth that is high enough to have an impact in various fields of life is not only limited to physical problems but also in the economic, social, cultural, political, and health fields. City as an urban living environment can grow and develop through two changes that are internally or externally [2].

Makassar is one of the most populous cities in Indonesia. Population density in Makassar makes this city inseparable from various urban problems that occur today.

In an effort to overcome these urban problems, the World Health Organization (WHO) in the 1980 introduced a concept that was considered a comprehensive approach aimed at facilitating and creating a healthier urban environment. The concept is healthy city [3].

The concept of a healthy city is an old and new concept. Old means that humans have been trying to make cities healthier since the beginning of urban [4].

A healthy city is a condition of a city that is clean, comfortable, safe, and healthy for residents to live in. The implementation is achieved through the application of several arrangements with integrated activities agreed by the community and local government. Organizing a healthy city is a variety of activities to realize a healthy city, through community empowerment, and a forum facilitated by the city government [5].

Regulations regarding the administration of healthy cities in Indonesia are regulated through Joint Regulation of the Minister of Home Affairs and the Minister of Health Number 34 of 2005 and Number 1138/Menkes/PB/VIII/2005 on August 3, 2005, concerning the implementation of healthy regencies/cities. The program for the realization of a healthy city in Makassar has been started since 2007. In Makassar, a healthy cities forum has been formed which serves as an

institution that facilitates the realization of the healthy cities program. Makassar city has won the Swasti Saba Wistara award 4 times in a row [6].

However, the implementation of a healthy city in Makassar is still not as smooth as imagined. The concept of a healthy city in Makassar still needs to be further evaluated. One way to determine the problem of implementing a program can be done by evaluating the program, the application process, or at the end of the application. Evaluation of a program or policy needs to be done to answer whether differences have been made from the implementation of a program [7].

The importance of identifying evaluations of the impact of interventions has been emphasized WHO. In preparation for and during the 1998 evaluation meeting, healthy city project evaluation documents were considered [8], [9]. Meanwhile, according to Tahalea *et al*. [10] said that an evaluation of the impact on a program or policy is carried out to assess individual impacts, organizational impacts, and impacts on the social system.

The WHO [11] states that one of the impacts of healthy city implementation is the degree of involvement. The impact consists of two indicators, namely, women's involvement and political commitment. Therefore, this study was conducted to evaluate the impact of the implementation of a healthy city in Makassar since its application in 2007.

Materials and Methods

This research was conducted in Makassar city as one of the cities that have consistently carried out a healthy city program since 2007. The time of the study was conducted from March 22, 2018 to May 1, 2019.

There were 13 informants in the study which consist of the Makassar Deputy Mayor, Healthy City Forum Chairperson of Makassar, Head of Socio-Cultural Affairs of Bappeda Makassar, Health Office Section Head of Makassar, Makassar District Health Communication Forum Chairperson, Section Head of Community Empowerment and Welfare (PMK) of Mamajang District, Section Head of Community Empowerment and Welfare (PMK) of Mariso District, Section Head of Community Empowerment and Welfare (PMK) of Panakkukang District, Section Head of Community Empowerment and Welfare (PMK) of Rappocini District, Section Head of Community Empowerment and Welfare (PMK) of Tallo District, Section Head of Community Empowerment and Welfare (PMK) of Tamalate District, Section Head of Community Empowerment and Welfare (PMK) of Tamalanrea District, and Section Head of Community Empowerment and Welfare (PMK) of Wajo District.

Data collection was carried out by in-depth interview with the informant. Then, the documentation of the activities was carried out through a document review of various literature and other sources.

Data analysis was performed qualitatively using grounded theory. The grounded approach starts with making research questions while continuing to collect data in the field. After the data are collected then the coding is done.

Results

Women's involvement

Based on the results of in-depth interviews (in-depth interviews) regarding the involvement of women, the informant said that women's participation in the implementation of healthy cities in the city of Makassar was very large, active, and participatory. This is shown from the results of in-depth interviews conducted with 13 respondents showing the results that the involvement of women in the implementation of the healthy city program can be seen from the chief coordinator in 9 of the 15 districts in the city of Makassar which are women. In addition, based on the results of direct observations made it is known that the person directly responsible for the healthy city program in Makassar is the head of the Makassar city health office, in this case, women. Furthermore, 70% of those involved in implementing healthy cities at the village and household level are women.

Politic commitment

Based on the results of in-depth interviews (in-depth interviews), regarding political commitment informants said that the political commitment of the city government is seen from various existing regional regulations that support the implementation of the healthy city program in Makassar. Based on direct observation and document review, it has been known that since the implementation of a healthy city in Makassar, there have been various regulations that were born or updated to adjust to the concept of a healthy city program that has been implemented by the government. In addition, the informant also stated that the political commitment of the Makassar city government is also evident from the many awards that Makassar city has received since the issuance of a national policy on the implementation of a healthy city in Indonesia as well as city government programs that are in line with the concept of healthy cities such as Healthy Hallway, Garden Hallway, Makassar Not Rantasa', LISA (See Trash Take), Sombere' City, and so on.

Discussion

An evaluation was carried out on the two impacts of implementing a healthy city in Makassar. The first impact is the impact of women's involvement in the implementation of healthy cities in Makassar, while the second impact evaluated is the impact of implementing healthy cities on political commitments from the Makassar city government. Both of these impacts show good evaluation results, but still need deeper study.

Involvement is an interest or motivational part that is generated by a particular stimulus or situation and is addressed through appearance characteristics. Involvement is seen as a person's relationship to an object based on needs, values, and interests [12]. Meanwhile, according to the WHO [11], the level of involvement is how much participation from the community in the implementation of a program or activity.

The key strategy of the healthy city program is to unite the involvement of various stakeholders from government, the private sector, non-governmental organizations, and all elements of society to focus on urban health issues and to address health-related issues broadly [11]. This makes stakeholder involvement very important. Women and the government are part of stakeholders who also have an important role in implementing healthy cities.

The involvement of women in the implementation of healthy cities in Makassar based on the results of the study was considered to be active and participatory. Based on the guidelines for the healthy city program by the WHO, it is emphasized that women's involvement is very important in the implementation of healthy cities. In general, the level of women's involvement in urban development initiatives tends to reflect the level of women's involvement in other aspects of city life [11].

This is shown from the number of field implementers in implementing healthy cities in Makassar, which are women. At the kecamatan level, all responsible/coordinators in the healthy kecamatan communication forum are women. Women are seen as the prime movers in society. The results of this study are in line with research conducted by the WHO [11] in the city of Dar-es-Salaam, Tanzania, which states that women's participation in the healthy city program in the city is very high. This is indicated by the large number of women workers in government agencies and the private sector who are responsible for implementing healthy cities in Dar-es-Salaam.

The next indicator is political commitment. Political commitment is defined as the commitment of political actors who have political influence in a city, such as the Mayor and Deputy Mayor [13]. Boonekamp *et al*. [14] described the need for high-level political commitment to the Kota Sehat program to increase the likelihood of program success. Time, cultural change, and goal determination efforts from healthy city coordinators affect the city government and other city organizations that support the implementation of the healthy city program [15], [16], [17].

Based on the results of the study, the political commitment of the Makassar city government toward the implementation of the healthy city program is very good. This is indicated by the existence of various regulations that are considered to support the implementation of the healthy city program in Makassar. In addition, Makassar city has won the highest award in the category of healthy cities at the national level, Swasti Saba Wistara for 4 times in a row, which also shows the high political commitment of the government in creating Makassar city as the best healthy city in Indonesia. The Makassar city government also always participates in various activities related to the healthy city and also supports the work of the healthy city forum in the city of Makassar. This was evidenced by various reports in the media and interviews with the Chairperson of the Makassar Healthy City Forum and the Head of the Socio-Cultural Affairs Section of the Makassar City Bappeda.

The results of this study are in line with research conducted by the WHO [11] in Dar-es-Salaam, Tanzania. The results of the study showed that the Mayor of Dar-es-Salaam along with the head of the health department in the city played a very active role in various activities related to healthy cities, by attending meetings that were scheduled on policies and implementation related to healthy cities and also cooperating with healthy city committees in cities.

Conclusion

However, coordination at the government level is expected to be further improved, because there is still frequent miss communication between several Satuan Kerja Pemerintah Daerah in the implementation of tasks to achieve healthy city indicators.

Recommendation

The level of involvement is one of the impacts in the implementation of a healthy city consisting of two indicators. An evaluation of the two indicators gave satisfactory results. The involvement of stakeholders in this matter is that women have been quite active and participatory. Besides that, the political commitment of the Makassar city government itself has succeeded in bringing satisfactory results to the development of the city. However, it is recommended for each Satuan Kerja

Pemerintah Daerah (SKPD) at the city government level to further improve coordination with each other, because there are still overlapping tasks between each SKPD.

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The Improvement of Experiential Learning Model-Based Management in Public Health Center (Puskesmas) of Indonesia

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Abstract

BACKGROUND: Indonesia, to date, has been conducting ineffective and inefficient training model for health workers in Public Health Center. Suitable training model needs to be developed in accordance with the issue in the workplace or public health center. Experiential learning training model is one of the alternatives to emphasize experience and interactive based learning.

AIM: This study aimed to test the effectiveness of experiential learning model by improving the health center management competence.

METOHDS: This research was conducted using quasi-experimental research through pre-post-test control design involving 30 heads of public health center and 30 heads of administration of public health center from various health centers in South Sulawesi. The data were collected using pre-post-test with reliability α Cronbach coefficient of 0.870.

RESULTS: The research found that the competence of group taught using experiential learning and Metaplan (mean=75.06) was better than the competence of the group taught using direct learning method (mean=61.89). Thus, it showed that there was a significant difference between the experimental and control groups ($p = 0.000$). There was a significant and positive correlation coefficient between the participants taught by experiential learning and direct learning ($p = 0.000$).

CONCLUSION: The materials discussed in the experiential learning were Planning, Implementation, and Assessment of Public Health Center Management, which was then resulting in increased competence of the participants of Education and Training for Health Workers of Public Health Center in South Sulawesi.

Introduction

As a health-care service facility, public health center provides first degree health service effort for the public and individual by prioritizing promotive and preventive efforts to achieve the highest degree of public health in its working area [1]. It is a functional health organization union in developing the public health in addition to build the role of the community and provides integrated and overall service to the community in its working area in the form of main activities.

A series of process including planning, organizing, actuating, and controlling is called as management to achieve the target or objective effectively and efficiently. Effective means that the objective expected is achieved through well, appropriate, and quality implementation process supported by accurate data and information (evidence based). Meanwhile, efficient means how the public health center can utilize the existing resource to implement the health-care effort according to the standard well and appropriately so that it can actualize the performance target that has been determined [2].

Competence is someone's ability in implementing his duty or work based on his skill and knowledge. Human resource competence development in health aspect is strategic component for health development to accelerate the equal distribution of health service and target achievement of the health development. The quality of human resource is the main element in determining the performance of an organization [3].

Experiential learning strategy facilitates learning well. It has same knowledge perspective in terms of how someone obtains knowledge which is how they learn. Experiential learning is an effective and strong theory to understand and model how people learn in an environment built socially [4]. Experiential learning was measured through indicators based on the stages of concrete experience which is how the training participant involved themselves entirely in the new experience by prioritizing feeling, reflective observation in which the training participant observes and reflects or

thinks the experience from various aspect by prioritizing watching, abstract conceptualization in which the training participant creates concepts integrating his observation into healthy theory by prioritizing thinking and testing in new situations/experiment, in which the training participant uses theory to solve problems and makes decision by prioritizing doing [4]. Meanwhile, competence is measured by knowledge level, behavior, and skill obtained as the learning result from the training.

Furthermore, this research looked for the contribution of experiential learning strategy on the competency of learning result of the training participant focusing on the experiential learning as the learning model alternative in education and training. This research aimed to test the effectiveness of experiential learning model by improving the health center management competence.

Materials and Methods

This research employed quasi-experimental through pre-post-test control design by involving 30 heads of public health center and 30 heads of the administration of public health center coming from various public health center in South Sulawesi as the research subject. There were two groups involved in this research; experimental group and control group. The research subjects were not chosen randomly to be involved in experimental group and control group [5].

The experimental group was taught using the experiential learning model (X1), while the control class was taught using direct learning (X2), as described in Table 1. The two-class groups were given pre-test (01 and 03) before taking the learning to measure the equality of the participants' initial ability. After the learning process ended, they were given post-test (02 and 04) to compare their competence before and after the intervention given, and between the experimental and control class. This design was done with treatment and observation schedules according to the stages of experiential learning made in Table 1.

Table 1: Research design of pre-test and post-test

Subject	Pre-test	Learning implementation	Post-test
Group A (experiment)	0_1	X_1	0_2
Group B (control)	0_3	X_2	0_4

Data collection tool

The question of pre-test and post-test

The managerial competence of the public health center was measured using pre-test and post-test, both for the experimental and control group. The test question consists of 15 questions of concrete experience, having reliability α Cronbach coefficient of 0.858, 15 questions reflective observation, having reliability α Cronbach coefficient of 0.878, 15 questions abstract conceptualization, having reliability α Cronbach coefficient of 0.888 and 15 questions Testing in New Situations/ experiment, having reliability α Cronbach coefficient of 0.858. Pre-test and post-test covered questions of planning (P1), implementation (P2), and assessment (P3) regarding the management of the Public Health Center.

Working book and Metaplan

The working book consisted of open questions regarding the planning (P1), implementation (P2), and assessment (P3) regarding the management of Public Health Center sourced from the Public Health Center Management Module [6] by considering the subtopic involved in competence test (pre- and post-test). Working book was designed by adopting the practice stages of the implementation of experiential learning in learning, according to Klob (2014).

Metaplan is the assistance tool on the participative training based on card involving the participant to become active to formulate idea and opinion together which was then visualizing it into Metaplan posters (cards were compiled in pieces of Plano papers/ flipchart) so that it showed interesting, solid and structured information. Since the result is in the form of visual, then it will be documented well. This design was validated by three experts; two of them are the professional in training, while another one is an expertise in the education field. The mean score of working book and Metaplan validation result was 82.33, while the pre-test and post-test was 8.00 or quite valid category to be used.

Data analysis

The data analysis was tested using an independent sample t-test to determine whether there is a significant score of the competence between the experimental and control groups. A paired sample t-test was used to determine to know whether there was a change of the competence score between the pre-test and post-test in each group. Furthermore, the Pearson correlation coefficient was calculated to determine whether there was a significant correlation of the score obtained from the competence achievement of the post-test with the working paper question result.

Creating an experiential learning scenario

The experiential learning model is the main object of the Public Health Center Management in which the sub-main discussion are planning (P1), implementation (P2), and assessment (P3) regarding the management of Public Health Center made assisted by Working Book and Metaplan with three stages, in which the first one was the working book fulfillment, the second one was formulating idea or opinion and then visualizing

it into Metaplan posters together (cards compiled into Plano paper/flipchart), while the third one was discussion concerning the management of the Public Health Center. Those stages led the learning participants to obtain the concept of planning (P1), implementation (P2), and assessment (P3) regarding the management of Public Health Center in stages. The learning was conducted for 24 h of learning (learning hour/JPL) in which each JPL was 45 min, by following the learning schedule made by the training committee (Table 2).

Table 2: Research design of pre-test and post-test

Implementation	Learning hour
EL Stage I Working Book Fulfillment P1	3
EL Stage II Metaplan P1	2
EL Stage III Discussion P1	3
EL Stage I Working Book Fulfillment P2	3
EL Stage II Metaplan P2	2
EL Stage III Discussion P2	3
EL Stage I Working Book Fulfillment P3	3
EL Stage II Metaplan P3	2
EL Stage III Discussion P3	3

In the initial meeting, the facilitator explained the experiential learning and the learning objective as well as grouping the participants into small groups consisting of 4–5 people. Then, the participants entered the main activities which were learning in the group as follow:

EL Stage I of Working Book. Fulfilling the working book through the EL stages of *concrete* experience, reflective observation, abstract conceptualization, Testing in New Situations/ experiment aiming to find the understanding process model of public health center management easily. In this stage, the participant constructed and understood the management of public health center-based on experiment and main discussion topic of the management of public health center by answering questions in the working book consisting of the discussion sub-topic of planning (P1), implementation (P2), and assessment (P3) regarding the management of Public Health Center.

EL Stage II: Metaplan aimed to produce design of the management of public health center, in which the participants formulated the idea or opinion together which was then visualizing it into Metaplan posters (cards were compiled in pieces of Plano papers/flipchart), based on the experiment and the main topic of public health center management of planning (P1), implementation (P2), and assessment (P3), as the next discussion material.

EL Stage III: Discussion aimed to develop the design of the management of public health center: Planning (P1), implementation (P2), and assessment (P3). In this stage, the participant discussed the concrete experience, reflective observation, abstract conceptualization, and testing in new situations/ experiment. Each participant was given the opportunity to share their different experience with the other participants in the form of Metaplan poster to be shown and explained to all participants. In this stage, the facilitator identified the participants' experiments which were supporting and also those which were encountering difficulties in the learning process.

Results

Experiential learning and direct learning

The Effect of experiential learning based on concrete experience, observation and reflection, abstract concepts, dan experiment/ testing new situation on participants' competence

The dependent t-test and Wilcoxon test in Table 3 show that the experiential learning improved the competence of the public health center management training participant with the significance <0.05 (sig.<0.05). Based on the following table, the score significant concrete experience (p = 0.00), observation and reflective (p = 0.00), forming abstract concepts (p = 0.025), and testing in new situation (p = 0.003) were obtained. Thus, it can be concluded that there was an effect of Experiential learning with p < 0.05 on the improvement of the competence of public health center management training participants in the training place or temporary system.

Table 3: The effect of experiential learning strategy on the competence of the participants of public health center training

Experiential learning (intervention)	n	Mean	Standard deviation	p value
Concrete experience (Planning)				
Pre-test score	30	60.43	7.21	0.000*
Post-test score		82.30	9.76	
Concrete experience (implementation)				
Pre-test score	30	54.00	11.62	0.000*
Post-test score		74.66	9.91	
Concrete experience (assessment)				
Pre-test score	30	52.66	12.71	0.001**
Post-test score		63.88	7.07	
Concrete experience				
Pre-test score	30	55.70	7.21	0.000*
Post-test score		73.61	9.76	
Observation and reflective (planning)				
Pre-test score	30	61.10	7.71	0.000*
Post-test Score		77.96	8.76	
Observation and reflective (implementation)				
Pre-test score	30	59.00	7.70	0.028*
Post-test score		64.00	10.53	
Observation and reflective (assessment)				
Pre-test score	30	56.33	10.05	0.258**
Post-test score		59.38.	8.35	
Observation and reflective				
Pre-test score	30	58.81	10.74	0.000*
Post-test score		67.12	9.74	
Forming abstract concepts (planning)				
Pre-test score	30	63.90	7.21	0.001*
Post-test score		76.46	9.76	
Forming abstract concepts (implementation)				
Pre-test score	30	58.93	13.43	0.024*
Post-test score		64.04	13.33	
Forming abstract concepts (assessment)				
Pre-test score	30	56.08	7.13	0.203**
Post-test score		59.45	7.13	
Forming abstract concepts				
Pre-test score	30	59.63	10.74	0.025*
Post-test score		66.65	9.33	
Testing in new situation (planning)				
Pre-test score	30	63.79	7.21	0.006*
Post-test score		73.96	9.76	
Testing in new situation (implementation)				
Pre-test score	30	58.60	13.43	0.183*
Post-test score		61.70	13.33	
Testing in new situation (assessment)				
Pre-test score	30	57.43	7.13	0.285**
Post-test score		59.78	8.13	
Testing in new situation				
Pre-test score	30	59.93	10.74	0.003*
Post-test score		65.15	10.33	

Source: Primary Data, Explanation: * Dependent t test, **Wilcoxon test

Table 3 indicates that the significance value is <0.05 (sig. <0.05); therefore, it can be concluded that the concrete experience (p = 0.00) affected the

competence of planning (P1), implementation (P2), and assessment (P3), the value of observation and reflective (p = 0.00) affected the competence of planning (P1), implementation (P2), and assessment (P3), the value of forming abstract concepts (p = 0.025) competence of planning (P1), implementation (P2), and assessment (P3), and the value of testing in new situation (p = 0.003) competence of planning (P1), implementation (P2), and assessment (P3).

The effect of experiential learning and direct learning on the competence of planning (P1), implementation (P2), and assessment (P3) on the education and training of the management of public health center in the training center

Based on Table 4, the significance value of the experiential learning strategy using dependent t-test = 0.00 while the direct learning using the dependent t-test as well as 0.045. Both of them had p = 0.05. It means that experiential learning and direct learning improved the competence of the participants of public health center management. Among them, the most influential strategy was experiential learning.

Table 4: The Effect of experiential learning and direct learning on the participants of public health center management training

Learning strategy	n	Mean	Standard deviation	p value
Intervention				
Experiential learning (planning)				
Pretest score	30	60.01	7.21	0.000*
Posttest score		83.63	9.76	
Experiential learning (implementation)				
Pretest Score	30	52.33	10.43	0.000*
Posttest score		76.33	13.33	
Experiential learning (assessment)				
pretest score	30	52.00	7.13	0.000**
Posttest score		65.21	7.13	
Experiential learning				
Pretest score	30	54.79	10.74	0.000*
Posttest score		75.06	5.82	
Control				
Direct learning (planning)				
Pretest score	30	52.86	12.85	0.026*
Posttest score		59.15	9.71	
Direct learning (implementation)				
Pretest score	30	52.67	10.06	0.036*
Posttest score		60.18	14.86	
Direct learning (assessment)				
Pretest score	30	51.78	11.51	0.061**
Posttest score		55.53	8.65	
Direct learning				
Pretest score	30	52.44	6.84	0.045*
Posttest score		61.89	9.74	

Source: Primary data, Explanation:*Dependent t test, **Wilcoxon test

The difference between experiential learning and direct learning on the competence of planning, implementation, and assessment of the participants of the education and training of public health center management in the training center

Table 5 describes the significance value of the two learning strategies uptake with p = 0.000 <0.05. Thus, it can be summed up that there was different competence uptake between the experiential learning strategy and those who did not implement the experiential learning strategy among the participants of the management of the Public Health Center in the training center. Table 5 also shows that the uptake of assessment (P3) was not distributed normally so that it was continued by non-parametric Mann–Whitney test.

Table 5: The difference of absorbance of experiential learning (intervention) and direct learning (control) uptake

Learning strategy		n	Mean	Standard deviation	p value
Experiential learning	Planning	30	23.61	19.04	0,000*
Direct Learning	uptake	30	6.28	14.63	
Experiential learning	Implementation	30	24.00	9.44	0.001*
Direct learning	uptake	30	7.51	8.69	
Experiential learning	Assessment	30	13.21	8.26	0.366**
Direct learning	uptake	30	9.74	12.38	
Experiential learning uptake		30	20,28	13.19	0.000*
Direct learning uptake		30	7.86	8.95	

Source: Primary Data, Explanation: *Dependent t-test, **Mann–Whitney test

Discussion

Experiential learning was measured using indicators based on the stages of concrete experience which is how the training participant involved themselves entirely in the new experience by prioritizing feeling, reflective observation in which the training participant observes and reflects or thinks the experience from various aspect by prioritizing watching, abstract conceptualization in which the training participant creates concepts integrating his observation into healthy theory by prioritizing thinking and testing in new situations/experiment in which the training participant uses theory to solve problems, and make decision by prioritizing doing [4].

Experiential learning is holistic and multilinear learning, which emphasized on experience as it has an important role in the learning process. It is also very inviting for the participation and activities of the participant so that it is suitable for adult learning so that the learning process becomes interactive, then it needs tools and material, including cards or colored papers, which can attract the participants' interest called Metaplan paper.

As a facilitation method/technique, Metaplan uses card media to collect, discuss, and develop ideas or opinions as well as agree on various things. Metaplan is first developed by a German named Eberhard. Since a visual media, Metaplan is developed by the participants themselves using various shapes and color of card while the discussion material comes from the experiment and knowledge of all participants, which is then reviewed and made as an experiential learning strategy.

Experiential learning or known as learning through creating an experience is one of the strategies in education and training, where the training participants share their experience as a knowledge source after the learning process in the Public Health Center Management learning process ends.

Direct learning is supported by behavior and cognitive social theories Arends [7]. The learning

behavior theories have been contributing a lot and significantly on the direct learning, especially from Skinner who stated that human learns and behaves in a certain way as the result of certain behavior strengthening. Facilitator which teaches according to the behavior principal designs the target and explains what will be learned by the participants, shares learning experiences, such as exercise, discussion and question, and answer so that the participant can give feedback and gives special attention on how to facilitates the participants' behavior in accepting the material in class.

An experiential learning strategy is a learning-teaching process model that activated the learner to build knowledge and skill through direct experience. An experiential learning strategy is a learning model which pays attention to the experiences owned by the training participants. The participant of the training directly involved in the learning process and they are from various health professions constructing their own experience obtained either in the training center or in their public health center. Therefore, it can become the knowledge source in implementing the management of a public health center and knowledge management.

This is in accordance with Amalia [8] who stated that experiential learning is the process of making meaning from direct experience. Based on the definition, experiential learning is a process of making meaning, understanding, or through direct experience. The learning strategy covers the material organizing strategy, material delivery strategy, which reviews the learning media and the organizing media, including learning strategy organization and learning media management strategy [9]. Effective, efficient, and interesting learning strategy to achieve suitable learning results for certain learning conditions is really needed to achieve the learning result [10].

Training is a systematic approach to increase the effectiveness of individual, team, and organization through the improvement of knowledge, skill, and behavior [11]. Training is defined as systematic effort in modifying and developing knowledge, and behavior needed in learning from the experience for specific performance often neglected [12].

Conclusion

This research review focused on experiential learning as a learning model alternative in education and training of health workers. This research was conducted on the training of public health center management participated by health workers. The participants came from various public health centers in South Sulawesi. The research result indicates that the use of the experiential learning model is for teaching the management of public health centers to become more effective in improving the competence of planning, implementation, and assessment compared to direct learning that has been used to date. The experiential learning model indicates a better learning result and produces health worker training, which is in accordance with the needs. The learning through experiential learning also looks more challenging since the learning starts from the experience in the working place (Public Health Center) and also the interactive between participant and facilitator using learning media of working book and Metaplan.

The experiential learning model focuses on the participants' experience integrated with the theory based on Public Health Center management module so that the participants were not only learning the reality in various public health center but also the scientific method based on the literature disciplines in the form of module. The application of experiential learning in education and training can encourage the participants to become interactive and learn based on their own experience in the temporary system (training center). This experience is really needed to implement the public health center management and encourage the participants to carry out knowledge management di public health centers (permanent system).

Experiential learning can be chosen as learning model in education and training, which pays attention to the learning environmental factors, including time adequacy, learning media needs, and other supports such as internet access. Such supports are needed to maximize the potential and experience owned by the participant and give an opportunity to the participant to develop their competence in the field of public health center management.

The policy makers who start to pay attention to online education and training for the health worker by considering to integrate experiential learning in it as education and training model which is in accordance with the participants needs and training according to each public health center.

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Water, Sanitation Dan Hygiene Analysis, and Individual Factors for Stunting among Children Under Two Years in Ambon

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Abstract

BACKGROUND: Nutrition problem is a problem that is still a threat in various countries around the world, one of which is stunting that occurs since the baby is in the womb and in the early period after the baby is born, but only appears after the child is 2 years old.

AIM: This study aimed to analyze the water, sanitation and hygiene (WASH), and individual factors for the incidence of stunting in children aged 7–24 months in the slums of Ambon City.

METHODS: The research was an analytical observational study using a case control study design. The population in this study was all children aged 7–24 months who suffered from stunting in Ambon. The samples were 150 child with a ratio of 1:1 for the case and control groups.

RESULTS: The results showed that WASH (OR=2.7, CI 95%: 1.379–5.566) dan status Berat Badan Lahir Rendah (OR=5.1; CI 95%: 2.279–11.445) was a stunting risk factor. Meanwhile, diarrhea status (OR=2.4; CI 95%: 0.793–7.302), immunization (OR=1.4; CI 95%:0.622–3.260), and smoking history of household members (OR=1.1; CI 95%: 0.540–2.086) are risk factors, but statistically not significant. Maternal education (OR=1.0) is not a risk factor for stunting in children aged 7–24 months.

CONCLUSION: The conclusion of this study is that the WASH condition and low birth weight status are risk factors for stunting in children aged 7–24 months in Ambon.

Introduction

Stunting is a condition of failure to thrive in children under five due to chronic malnutrition so that the child is too short for his age. The incidence of stunting in children under 5 years decreased from 198.4 million children under five (32.6%) in 2000 to 150.8 million children under five (22.2%) in 2017. Stunting in children in Asia has decreased from 38.1 % to 23.3% since 2000 [1].

Maluku is one of the priority provinces for stunting intervention. Based on the results of Basic Health Research 2018, the prevalence of stunting in Maluku was 33.7%. This figure shows a decrease from 2013, which is 45.2% [2].

In general, the causes of stunting are classified into three groups, namely, community, family, and individual. Factors at the community level that can cause stunting include: Economic systems, education systems, health systems, and sanitation and clean water systems; at the family or household level, the factors that cause stunting are inadequate quality and quantity of food, income, number, and structure of family members, parenting, inadequate health services, and inadequate sanitation and clean water; individual/child factors that cause stunting are unequal nutritional intake, low birth weight (LBW), and health status or history of infectious diseases [3].

Environmental conditions such as water and poor sanitation are factors that underlie children's growth and development that are not optimal. Based on Torlesse *et al*. [4] research conducted in three different typologies in Indonesia, there was an interaction between household sanitation facilities and water treatment with stunting ($p < 0.007$). Among children who live in households that drink water without being treated, the odds ratio (OR) for stunting is 3 times greater than households that treat water before consumption (OR=3.47; 95% CI=1.73–7.28; $p < 0.001$). Humphrey [5] states that toilet ownership, handwashing practices with soap, and good water quality are factors that can prevent diseases that can be caused by the environment and can also reduce the risk of stunting.

Children who live in slums are a group that is vulnerable to malnutrition. Ambon City is the Capital

of the Maluku Province, which has 102.64 ha of slum spread over 15 slum areas. The prevalence of stunting in Ambon tends to fluctuate. Based on e-PPGBM data (Community Based Nutrition Recording and Reporting) in 2018, the prevalence of stunting in Ambon City is 22%. This figure shows an increase in prevalence, although not significant. Seeing these problems, researchers tried to conduct research related to the analysis of water, sanitation, and hygiene (WASH) and individual factors on the incidence of stunting in toddlers aged 7–24 months in the slums of Ambon City.

Materials and Methods

This type of research is an analytic observational study using a case–control study design. This research was carried out from November 2019 to December 2019 in Negeri Batu Merah, Ambon City. The consideration of choosing a research location in that place is because Batu Merah State is a country with a heavy slum classification in Ambon City.

The population in this study was all children aged 7–24 months who suffered from stunting in Ambon City. The sample in this study was all children aged 7–24 months who were selected to be the subject of research at the study site. Sampling in the case group was done by a probability sampling technique, whereas in the control group was done by simple random sampling. The number of samples is 150 people with a ratio of 1:1 for the case and control groups.

The data in this study consist of two, namely, primary data and secondary data. Primary data are data obtained directly by researchers through a process of direct interviews with respondents and observation. Secondary data were obtained from the Health Office and Puskesmas regarding the nutritional status of new children as well as data on the residence of children under five and other relevant secondary data sources.

The data collected were then analyzed using SPSS. Univariate analysis was performed to see the frequency distribution of the studied variables. Bivariate analysis was performed using Chi-square to see OR with the aim of knowing the risk factors of each variable.

Results

The results showed that respondents' drinking water quality was mostly low risk, both the case group (33.3%) and the control (82.7%). Similar to sanitation, 54.7% in the case group and 62.7% in the control group had sanitation with a low-risk category. Hygiene conditions in the case group are mostly included in the high-risk category (62.7%) while in the case group as much as 62.7% in the low-risk category (Table 1).

Table 1: Frequency distribution of WASH in children under two in Ambon 2019

WASH variable	Group study			
	Cases (n=75)		Controls (n=75)	
	n	%	n	%
Water				
High risk	25	66.7	13	17.3
Low risk	50	33.3	62	82.7
Sanitation				
High risk	34	45.3	28	37.3
Low risk	41	54.7	47	62,7
Hygiene				
High risk	47	62.7	28	37.3
Low risk	28	37.3	47	62.7

WASH: Water, sanitation, and hygiene.

WASH variable with the stunting event obtained OR=2.7 (95% CI: 1.379–5.566). This figure shows that the value of the lower limit (LL) and upper limit (UL) does not include a value of 1; therefore, it can be interpreted that the WASH condition with a high-risk category is 2.7 times stunted compared to the low-risk WASH condition. LL and UL values that do not include a value of 1 means that there is a significant relationship between WASH and the incidence of stunting (Table 2).

The LBW status variable obtained an OR value of 5.1 (95% CI: 2.279–11.445). This shows that babies born with LBW are at risk 5.1 times stunted compared to babies born with normal birth weight. LL and UL values that do not include number 1 mean there is a significant relationship between LBW status and stunting events (Table 2).

Table 2: Distribution of risk factors of stunting in children under two in Ambon

Variable independent	Kelompok Studi				OR	CI 95%
	Kasus (n=75)		Kontrol (n=75)			
	n	%	n	%		
WASH						
High risk	35	46.7	18	24.0	2.7	1.379–5.566
Low risk	50	53.3	57	74.0		
Low birth weight						
Yes	33	44.0	10	13.3	5.1	2.279–1.445
No	42	56.0	65	86.7		
Diarrhea status						
High risk	70	93.3	64	85.3	2.4	0.793–7.302
Low risk	5	6.7	11	14.7		
Immunization status						
Complete	16	21.3	12	16.0	1.4	0.622–3.260
Incomplete	59	78.7	63	84.0		
Maternal education						
Low	1	1.3	1	1.3	1.0	0.61–16.289
High	74	98.7	74	98.7		
Smoking history of household members						
Smokers	50	66.7	49	65.3	1.1	0.540–2.086
Non smokers	25	33.3	26	34.7		

WASH: Water, sanitation and hygiene.

Diarrhea suffered based on calculations shows the value OR=2.4 (95% CI: 0.793–7.7302). This figure shows that children who suffer from diarrhea have 2.4 times the risk of stunting, but because the LL and UL values include a value of 1 there is no significant relationship between the status of diarrhea with the incidence of stunting (Table 2).

Immunization status shows an OR value of 1.4 (95% CI: 0.622–2.131). This means that children who have

incomplete immunization status have 1.4 times the risk of stunting compared to children with complete immunization status. UL and LL values, including one, mean that there is no meaningful relationship between immunization status and the incidence of stunting (Table 2).

The mother education variable shows the value of OR=1.0 (95% CI: 1.61–16.289). Mother's education is not a risk factor for stunting. LL and UL values that include number one indicate that maternal education does not have a significant relationship with the incidence of stunting (Table 2).

Family history of smoking received an OR=1.1 (95% CI: 0.540–2.086). This figure shows that children who live with household members who have a history of smoking are 1.1 times more likely to experience stunting compared to children who live with household members who have no smoking history. LL and UL values that include number one indicate that the smoking history of household members has no significant relationship with the incidence of stunting (Table 2).

Discussion

WASH conditions have a positive impact on the nutritional status of children. The results of this study indicate that WASH is a risk factor for stunting in Ambon City.

This study is in line with research conducted by Torlesse *et al*. [4] who got the result that children who live with poor sanitation and water treatment facilities have stunting risk 3 times. In addition, research conducted in Indonesia by Semba *et al*. [6] showed that toddlers living in homes with healthy latrines had a lower chance of suffering from stunting compared to toddlers living in homes that had inappropriate latrines.

Poor WASH conditions can potentially lead to infectious diseases that can interfere with the absorption of nutrients in the digestive process, such as diarrhea, worms, or environmental enteropathy. These infections and conditions directly affect nutritional status in a variety of ways, including loss of appetite, impairment of nutrition or malabsorption, chronic immune activation, and other responses to infections that can interfere with absorption of nutrients and energy [4]. If this condition occurs in a long time and is not accompanied by giving adequate intake for the healing process, it can lead to stunting.

LBW history is a risk factor for the incidence of stunting found in this study. The results obtained are in line with research conducted in the Philippines by Blake *et al*. [7] that babies born weighing <2.500 g are 3 times more likely to experience stunting compared to children born with normal weight. The same thing was found from the research of Rukmana *et al*. [8] who found that LBW is a risk factor for stunting in children aged 6–24 months in Bogor City.

LBW babies are a predisposing factor for achieving growth after birth. Early growth retardation, together with suboptimal cognitive development and stunted internal organ growth, can result in low cognitive abilities and lead to a risk of chronic disease later in life [9]. The period of pregnancy up to the first 2 years of age of the child is a critical period. Growth disturbance in this period is difficult to repair, and the child has difficulty achieving optimal growth and development [10].

In LBW without congenital abnormalities, central nervous system injury, very LBW (BBLSR), and striking intrauterine growth restriction, physical growth in the first 2 years tend to approach the physical growth of a normal-born baby. However, babies with LBW rate are usually not able to pursue physical growth, especially if they experience severe chronic sequelae, do not get adequate nutrition, and an inadequate care environment. The baby will experience growth disorders marked by weight and height, not in accordance with normal criteria or standards [11].

The results of this study indicate a history of diarrheal disease is a risk factor for the occurrence of stunting, although the relationship between the history of diarrheal disease and stunting is not statistically significant. Research by Taguri [11] found that toddlers with a history of diarrhea were more at risk of stunting. The same thing was also found in the study of Semba *et al*. [6], which shows that diarrheal disease is associated with the incidence of diarrhea in children under five in rural areas of Indonesia.

Each episode of diarrhea can result in a lack of ability to absorb food essence, so if the episode is prolonged, it will have an impact on children's growth and health. If this condition occurs in a long time and is not accompanied by adequate intake of food for the healing process, eating can cause stunting [13].

The results of this study indicate that incomplete immunization status is a risk factor for stunting, although it does not have a significant relationship. Research conducted by Al-Rahmad *et al*. [14] shows similar results that toddlers who do not get complete basic immunization are 3 times at risk of experiencing stunting compared to toddlers who get complete basic immunizations. In line with research conducted in India by Dhok and Thakre [15], which obtained incomplete immunization results had a significant relationship to the incidence of stunting in infants.

Basic immunization is very important for toddler immunity. This is due to children who do not get complete immunization will experience immune disorders against infectious diseases due to decreased antibody production, which results in easy entry of germs. If a toddler does not have immunity to the disease, then the toddler will lose body energy faster

due to infectious diseases. The final impact of this problem is the failure of optimal growth in accordance with the rate of aging so that it will increase the prevalence of stunting [14].

Mother's education in this study was not a risk factor for stunting. This is because almost all parents of toddlers who become respondents have a high level of education (≥SMA). The results of this study are in line with research conducted by Taguri *et al*. [12], which found that the level of education of mothers did not have a significant relationship with the incidence of stunting. A high level of education of the mother does not guarantee that the mother has sufficient knowledge about good nutrition, so it does not rule out the possibility of the child experiencing malnutrition, including stunting. In addition, the results of this study found, although mothers have a high education, most mothers do not work, so this affects the economic status of the family.

Good child care is not only based on mother's education, but on how mothers understand the correct parenting so that children can avoid stunting. Similar to father education, the results of this study indicate that father education is not a risk factor for stunting. This happens because, even though fathers have high levels of education, fathers tend not to be directly involved in child care. Fathers spend more time outside the home to make a living so that care and parenting are entirely left to the mother.

This study found that the smoking history of members of the house date is a risk factor for stunting, but it is not statistically significant. A similar study conducted by Sari [16] shows the same thing, cigarette consumption of parents will be at risk of having children who have stunted 1.15 times greater than children whose parents do not consume cigarettes. Other studies show that smoking in the home is significantly related to the incidence of stunting [17], [19], [20].

Cigarette smoke parents smokers give a direct effect on growing children. Cigarette smoke interferes with the absorption of nutrients in children, which in turn will interfere with child development and development [2]. Abnormalities of leukocyte function are found in children whose parents smoke. The nicotine in cigarettes directly reacts with chondrocytes (cartilage cells) through special nicotine receptors, which causes stunted bone growth.

Conclusion

The conclusion of this study is that the WASH condition and low birth weight status are risk factors for stunting in children aged 7–24 months in Ambon.

Recommendation

It is recommended that there is a need for childcare education programs and community nutrition education for parents and WUS as prospective mothers by providing counseling that can be done by local village midwives, posyandu cadres, or nutrition workers from the Puskesmas area.

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Implementation of the National Health Insurance Referral System at the Public Health Center in the Pangkajene Kepulauan District in 2019

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Abstract

BACKGROUND: The health service referral system is the organization of health services that regulate the mutual assignment of tasks and responsibilities of health services both vertically and horizontally.

AIM: The purpose of this study was to determine the appropriateness of referral service operational standards at the Kalabbirang Public Health Center in Pangkajene Kepulauan district.

METOHDS: This research method uses a qualitative with a phenomenological. The location of this study is in the Kalabbirang Public Health Center. The informants in this study were the Head of Medical Records Installation, the medical records installation staff of registration, doctors, and nurses. Data collection techniques using in-depth interviews, document review, and observation. The data obtained analyzed using the content analyze.

RESULTS: The results showed that the Kalabbirang Public Health Center, no operational service standards were governing the procedures of the Public Health Center when receiving patients to be referred back. In addition, doctors do not explain in full to patients information about the referral. The conclusion of this research is the implementation of the referral system at the Kalabbirang Public Health Center in terms of the requirements for referring to be in accordance with the national referral system.

CONCLUSION: We need socialization to understand more deeply about the referral system and equate perceptions among health workers about the referral mechanism in the Kalabbirang Public Health Center.

Introduction

The Public Health Center is a health service facility that organizes public health efforts and first-level individual health efforts, with more emphasis on promoting and preventive efforts, to achieve the highest degree of public health [1]. To improve the degree of public health and support the success of national social security, Public Health Center needs to be reorganized to improve accessibility, affordability of health facilities, and quality of health services.

The first-level health facilities as gatekeepers in the era of national health insurance are required to provide comprehensive primary services with quality health services [2]. Hence, the first-level health facilities are expected to be an excellent health service facility. To support these services, financing through the capitation system is strongly supported by the government. Capitation is a financing system that is calculated based on the number of national health insurance membership in first-level health facilities [3]. The tiered referral system is an effort to increase cooperation between health facilities.

The health service referral system is the organization of health services that regulate the mutual assignment of tasks and responsibilities of health services both vertically and horizontally. Vertical referral is a referral between health services of different levels which can be done from lower service levels to higher service levels or vice versa while horizontal referral is a referral between health services in one level, carried out if the referrer cannot provide health services according to patient needs due to limited facilities, equipment [4], [5].

Based on data from health insurance, the number of first-level outpatient visits is the number of participants who examine first-level health facilities. The number of visits first-level outpatient in 2017 reached 150,288,478 visits or an increase of 24.29% when compared to the realization in 2016 (120,922,433 visits). The number of referrals from first-level health facilities nationally in 2017 reached 18,891,657 referrals, with a referral ratio of 12.56% and an average

number of referrals per month of 1,574,305 references (BPJS, 2017). The percentage of referral exceeds the target of safe zone indicators based on health insurance regulation No. 2 of 2015, namely, <5% [6].

Based on data obtained from the Pangkajene Kepulauan District Health Office in 2017, the total number of national health insurance participant referrals in all Public Health Center in Pangkajene Kepulauan District who were referred to advanced referral health facilities in 2017 was 19,789 (9.5%) referral cases, whereas in 2018, the number overall national health insurance participant referrals in all Public Health Center in Pangkajene Kepulauan District who were referred to Advanced Referral Health Facilities increased by 36,406 (15.3%) referral cases. The number of referral cases in Pangkajene Kepulauan District exceeds the indicator target set by health insurance. Factors that cause a high ratio of referral rates are the incompatibility of drugs with the needs that exist in the health center, the continued high treatment for chronic diseases [7], [8].

Therefore, it is necessary to assess the quality of referrals to see whether the patients referred are following the operational service standards and see aspects of the completeness and accuracy of the referral. The increase in the number of referrals in first-level health facilities companied by the low quality of referrals will result in inefficiency and result in losses by health insurance. This study aims to explore in-depth information from informants regarding the implementation of the national referral system at the Kalabbirang Public Health Center.

Materials and Methods

This research was conducted at the Kalabbirang Public Health Center, Pangkajene Kepulauan District of South Sulawesi Province in the August-September 2019 period. The type of research was qualitative with a phenomenological approach. The focus of this research is on the role and experience of informants in implementing the referral system.

The informants in this study were determined by the principle of suitability and adequacy. The technique of taking informants in this study is purposive sampling technique. Determination of the initial informant will begin with the head of the medical records installation, then the next informant is the medical records installation staff, registration, doctors, and nurses as well as patients.

Data collection is done by extracting data from various techniques and sources to clarify information in the field. The data obtained are primary. These primary data were obtained by in-depth interviews, observation, and document review.

Data obtained from the results of interviews with informants were further analyzed by content analysis methods. Content analysis is a technique used to analyze and understand the contents of information.

Results

The focus of this research is the process component in the systems approach theory, because this study wants to see how the implementation of a program that is the referral system program at the Public Health Center. What is included in the process component in this research is the suitability of the existing operational service standards at the Kalabbirang Health Center to Permenkes No. 001 of 2012 concerning the referral system.

In this study, what is meant by conformity to the operational standard of referral system services is that the health workers in the Kalabbirang Health Center in carrying out referrals are based on the operational standards of referral system implementation. In this study, it is known from the results of in-depth interviews and document review that the Public Health Center already has a referral operational service standards. This operational service standard is intended as a reference in referring patients from the health center to the hospital. In this operational service standards, two work procedures have been arranged, namely, if the patient is referred vertically and if the patient requests the referral himself. From the document review, the researcher is of the opinion that this operational service standard does not yet represent all activities in the national health insurance system, the operational service standards of the Kalabbirang Health Center only regulate how to refer patients to the hospital and procedures to refer patients at their own request, there are no procedures from the Public Health Center itself when receiving patients refer back.

From the results of in-depth interviews on Table 1, information was obtained from several informants who said that the referral operational service standards were found in various Kalabbirang Health Center.

Unlike the two informants said that a referral operational service standards for the internal Kalabbirang Public Health Center were to be made. From the results of in-depth interviews with patients, there are some patients who claim to have asked for their own referrals on the grounds that the disease does not heal with treatment and medication given at the Kalabbirang Health Center. From the results of in-depth interviews, it is known that the reason why referral cases at the Kalabbirang Health Center in 2018 were that the highest was due to the process of referral action. Many patients turned out that their health facilities were not at the Kalabbirang Health Center but because the distance between their homes to the Kalabbirang Health Center was closer to the health facilities. It is written on the health insurance card and therefore patients prefer

Table 1: Analysis of referral system in Public Health Center Kalabbirang according to guidance system reference national, 2019

No.	National referral system guidelines	Implementation at the Public Health Center	Study it
	Managing referrals from first-level to second-level health facilities		
	A. Terms refer		
1	The patient to be referred has been examined and it is stated that the patient's condition can meet the requirements for referral, vital signs are in good condition/ stable and transportable and meet one of the conditions for referral	At PHC, Kalabbirang implementation of the referral system has been qualified for referral of patients, but some cases of patients ask their referrals and also some of the patients treated at health centers Kalabbirang listed on health facility other	Corresponding
	B. Standard procedures refer patients		
1	(a) Referral clinical procedures: Clinical procedures in cases of no emergency referral processes follow the established routine procedures, namely, providing health care to receive patients at the Public Health Center, conducting, anamnesis, physical examination, and medical support examinations that can be done by the Public Health Center to determine the diagnosis of the patient	At the Kalabbirang Public Health Center, the referral system implementation in carrying out clinical procedures has been by established routine procedures, but the Kalabbirang Public Health Center does not yet have an operational service standards regarding no emergency case referrals	Corresponding
	(b) Patients who come in a state of emergency and need medical emergency assistance, the authorized officer immediately conducts immediate assistance (life-saving procedures) to stabilize the patient's condition according to the operational service standards	Kalabbirang Public Health Center operational service standards regulates the stabilization of emergency patient conditions to be referred	corresponding
	(c) Concludes the case that the patient meets the requirements for referral, according to one of the criteria in the patient's referral requirements	Conclusion of cases that patients meet the requirements for referral has been carried out by the Kalabbirang Public Health Center	Corresponding
	(d) Preparing referrals for patients by giving patients and/or their families an explanation in a language understood by the patient/family, and informed consent as part of operational procedures that are very closely related to the technical procedures of patient care must be carried out	Kalabbirang Public Health Center has provided the patient or family with a clear explanation and also provided an informed consent sheet to the patient	Corresponding
	(e) Explanation related to the disease/patient's health problems and the patient's current condition, the purpose, and importance of the patient must be referred, where the patient will be referred, the consequences or risks that occur if the referral is not made, and the benefits of referral	Kalabbirang Public Health Center only provides an explanation of the results of the patient's diagnosis, the importance of the patient must be referred, but does not explain in full about where the patient will be referred, the consequences or risks that occur if the referral is not done and the benefits are made referral	Not appropriate
	(f) Plans are made and the process of implementing referrals as well as possible actions to be taken in the referral health facilities to be addressed	Kalabbirang Public Health Center has carried out plans and the process of implementing referrals as well as possible actions to be taken at the referral health facilities to be addressed	Corresponding
	(g) Explained the things that need to be prepared by the patient/family	Kalabbirang Public Health Center has explained to patients what things must be prepared	Corresponding
	(h) Other explanations relating to the referral process including various complete requirements to give patients/family opportunities	Kalabbirang Public Health Center provides explanations as needed to the patient's family as well as his patients	Corresponding
	(i) The final decision on the referral implementation plan is on the patient and or his family to agree or refuse to be referred according to the existing referral flow, as well as the final agreement or the results of the explanation stated by signing the two parties in the format of informed consent according to the procedure	Implementation of informed consent has been carried out by the Kalabbirang Public Health Center, by signing the two patients/families with medical personnel in an informed consent format according to the procedure	Corresponding
	(j) The approval of the referral of the patient/family, health center is authorized to prepare a referral by providing measures pre-referral suit the patient's condition before referral by operational service standards	Kalabbirang Public Health Center has asked permission from the patient or the patient's family to prepare the action before referral	Corresponding
	(k) Public Health Center call back service units in health facility referral destinations, to ensure once again that the patient can be accepted in health facility referral or have to wait a while or find health facility other reference as an alternative	The Kalabbirang Public Health Center not call back health facility referral destinations to ensure once again that the patient can be accepted in health facility referral destinations or have to wait a while or find health facility other reference as an alternative	Not appropriate
	2. Referral administration procedures		
	(a) Done in line with the technical procedures of the patient	The Kalabbirang Public Health Center carries out administrative procedures by technical procedures on patients	
	(b) Completing the patient's medical record, after the action to stabilize the patient's pre-referral condition	The Kalabbirang Public Health Center has completed the patient's medical record to be referred as well as stabilization measures, completeness in the form of a patient diagnosis, diagnosis code, and Poli and hospital to be referred for referral	
	(c) After the Public Health Center has given a complete explanation and the final decision has been taken to agree or refuse to be referred, it must still complete informed consent according to the format of the procedure for the signatures of both parties, the Public Health Center and the patient/family	The Kalabbirang Public Health Center has completed informed consent according to the format of the procedure for the signatures of both parties, the Public Health Center and the patient/family if the final decision agrees or does not agree to be referred	Corresponding
	(d) Furthermore, the informed consent format that has been signed is stored in the patient's medical record, if an ICT/ICT device has been used the informed consent format can be supplemented with photos, recordings of the decision-making process talks, and others	The Kalabbirang Public Health Center has kept an informed consent format that has been signed and is stored in the patient's medical record but has not used ICT/ICT	Corresponding
	(e) Furthermore, if the patient has agreed to be referred, then PHC must make a referral of patients in 2, the first copy was sent to health facility referral with the patient, the second sheet is stored as a record shared medical records of patients who will be referred	The Kalabbirang Public Health Center has made a duplicate patient referral letter, the first sheet is sent to the referral health facility with the patient, the second sheet is kept as an archive with the patient's medical record to be referred	Corresponding
	(f) Public Health Center must record patients in the patient's referral register	The Kalabbirang Public Health Center does not have a special book for referral cases	Not appropriate
	(g) Administration of sending patients must be completed when the patient will be referred immediately	Administration of patient delivery has been completed when the patient will be referred immediately	Corresponding

to go to the Kalabbirang Health Center. The following excerpts from the results of in-depth interviews with doctors:

"… here we also often get patients who go for outpatient treatment but the health facilities are not health facilities at the Kalabbirng Health Center, but for example the health facilities at the Bungoro Health Center, while he lives in bearing are there, so they are prefer to seek treatment here, and inevitably we serve one by one, then we educate ee we tell the concerned if you want to go back for treatment here, please change the health facilities" (ID, 45 years old)

Discussion

In this study, it is known from the results of in-depth interviews and document reviews that the Public

Health Center already has a referral operational service standard. This operational service standard is intended as a reference in referring patients from the health center to the hospital. In this operational service standard, two work procedures have been arranged, namely, if the patient is referred vertically and if the patient requests a referral himself. Operational service standards at the Kalabbirang Health Center are incomplete because there are no operational service standards for emergency patients.

The implementation of the referral system in Indonesia has been arranged in a tiered or tiered form, namely, first, second, and third level health services, which in its implementation are not independent but are in a system and are interconnected. If the primary health service cannot perform primary level medical treatment, he/she surrenders the responsibility to the level of service above it and so on [9]. Similarly, research conducted by Vendetti *et al*. [10] in Cambodia said that most health centers (60%) had contacted referral hospitals before transferring patients while other health centers (40%) did not contact higher facilities before transferring patients. However, only 21% of facilities from the health center always contact the hospital when referring patients [10].

In this operational service standard, two work procedures have been arranged, namely, if the patient is referred vertically and if the patient requests the referral himself. This study is in line with research who said that the Sarolangun Health Center, Sarolangun District, Jambi Province, operational service standards of a referral system was available and its contents were only rules for referring to other Public Health Center [11] which means that for the referral process to another Public Health Center or to the hospital already exists but for the rules or operational service standards to receive a back referral does not yet exist [12]. Research demands that patients want a referral because they lack trust in health services at the first level of health facilities so that even though it is explained repeatedly that the disease can be treated at the Public Health Center but insists on continuing to ask for a referral by threatening to leave the Public Health Center [13]. Similar to the research which said that in the Siko Community Health Center, the operational service standards about the referral system is not yet complete, the contents of which are the patient service flow operational service standards, the process of referring patients from the health center to the hospital as referrers, while the operational service standards in receiving referrals forth are not yet available [14].

Based on Table 1, the implementation of the referral system at the Kalabbirang Health Center which is not appropriate, namely, the explanation relating to the patient's illness/health problem and the patient's current condition, the purpose and importance of the patient must be referred, where the patient will be referred, the consequences or risks that occur if the referral is not carried out, and the benefits of doing referrals and also the Public Health Center not contacting the destination health facilities again.

The reason why the Public Health Center does not fully inform patients about patients will be referred to where because in the Pangkajene Regency, there is only one regional hospital, Pangkep Regional Hospital, so although not informed the patient will understand where he will be referred to, to inform about the advantages and disadvantages of the referral to the patient not done in the Kalabbirang Community Health Center because according to informants, important information is only information on the results of the diagnosis and then gives a referral approval letter to the patient. In accordance with research that says that in Sarolangun Public Health Center, the explanation that should have been explained by the doctor was not explained in full [15].

The implementation of the referral system at the Kalabbirang Community Health Center which is not yet compatible with the second is the Public Health Center not to contact the hospital or health facility for the referral destination after the patient completes all administration before referral, the reason being that there are many patients so that the patient does not have the time to reconfirm the referral hospital. This study is in line with research it is known that the Tambakrejo Health Center and the Kali Kedinding, Surabaya, before making a labor referral contact the destination hospital first and submit a case that will be referred to guarantee the availability of a place in the hospital and not confirm repeated when the patient has completed all forms of administration because it has been previously confirmed [16], [17], [18], [19].

Conclusion

Based on the findings and conclusions of the need for socialization to be able to understand more deeply about the referral system and equate perceptions among health workers about the referral mechanism in the Kalabbirang Public Health Center.

Recommendation

Suggestions in this study are based on the findings and conclusions of the need for socialization to be able to understand more deeply about the referral system and equate perceptions among health workers about the referral mechanism at the Kalabbirang Public Health Center.

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Attitude of Health Workers to the Utilization of Immigrant Patients Health Services in Tamalanrea Health Center

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Abstract

BACKGROUND: Types of health service utilization in Tamalanrea Health Center that can be used by immigrant patients are in the form of outpatient facilities, inpatient care, and home visits by health workers.

AIM: This study aimed to assess the attitude of health workers toward the utilization of health services for immigrant patients in the Tamalanrea Health Center.

METOHDS: This study used quantitative with a total sample of 59 people selected by purposive sampling. Data obtained through observation and distribution of questionnaires covering the attitude of health workers. The data that have been collected are processed using SPSS.

RESULTS: The results showed that the age of 26–36 years (44.1%) the most, the sex of the respondents the most is male (91.5%), the most recent respondent education was high school (44.1%), the country of origin of the most respondents was from Afghanistan (89.8%), and the length of stay in Makassar was at most for 5 years (28.8%). Of the 59 respondents, the majority stated that they were quite satisfied with the attitude of health workers in the Tamalanrea Health Center.

CONCLUSION: It was concluded that the attitude of health workers toward the utilization of health services for immigrant patients in general has a statistically significant relationship. It is expected that the attitude of health workers can be maintained and further improved so that the utilization of health services by immigrant patients increases.

Introduction

Utilization of health services at the health center level has several factors that influence it, namely, consumer factors in the form of: Education, livelihoods, knowledge, and perceptions of patients; organizational factors such as availability of resources, affordability of service locations, and social access; and service provider factors including behavior of health workers [1].

Puskesmas is a first-level health service center that organizes quality health services. The service efforts that are organized are public health services, namely, promotive and preventive efforts in the community in the Puskesmas work area, basic medical services, namely, curative and rehabilitative efforts with individual and family approaches through treatment efforts aimed at curing diseases for certain conditions [2].

Indonesia is one of the largest archipelagic countries in the world and has a very unique and strategic geographical situation. The position of Indonesia makes Indonesia a place of connecting between the Asian continent and the Australian continent. Because of its location at the crossroads, Indonesia has become one of the favorite places for asylum seekers and international refugees as temporary shelters where Australia is the main destination country to seek protection or asylum. However, some illegal immigrants really want to stay to get a more decent living than in their home country [3].

In 2017, the President of the Republic of Indonesia signed a Presidential Regulation concerning the Handling of Refugees from Abroad. The presidential regulation contains the main definitions and regulates the detection, shelter, and protection of asylum seekers and refugees. Various provisions in the Presidential Regulation are expected to be implemented immediately. This will make the Government of Indonesia and UNHCR work more closely, including in the field of joint registration for asylum seekers [4].

Furthermore, the Indonesian government in the health sector has guaranteed the healthcare of immigrants by collaborating with the International Organization for Migration (IOM) with various hospitals and Puskesmas. This guarantee is out of the monthly allowance that is not given to immigrants every month. Thus, if an immigrant patient goes to a health center or hospital in collaboration with IOM, then all costs will be borne by IOM, but if the immigrant gets treatment outside of collaboration with IOM, then the immigrant

must pay the fee with his pocket money. They have the right to choose where they want to get health services that make them feel satisfied with the services obtained [4].

The attitude of health workers is one of the factors that influence the utilization of health services so that it must be maintained and further improved so that patients feel comfortable and feel satisfaction in doing the treatment at the health center by getting a good attitude from the officers.

Research conducted by Singal *et al*. [5] in Kima Bajo Village shows that the attitude of health workers has a significant relationship in the utilization of health services. The existence of good and attentive treatment becomes a special attraction in providing services to patients. This fosters psychological influence and motivation for patients to utilize the health services provided [6]. Therefore, this study aimed to determine the attitude of health workers in the utilization of health services by immigrant patients in Tamalanrea Health Center.

The actions or ways in which officers perform services are things that greatly affect patients in the use of services. Actions or ways in which officers perform services are things that greatly affect patients associated with healing the disease. The existence of good and attentive treatment becomes a special attraction in providing services to patients. This provides psychological strength for patients and fosters a motivation to utilize the services provided [7].

The purpose of this study is to determine the relationship between the attitude of health workers in the utilization of health services for immigrant patients at Tamalanrea Health Center.

Materials and Methods

The study was conducted at the Tamalanrea Health Center in Makassar City, in August–September 2019. This research was conducted using a quantitative method with a case approach that aims to examine the attitudes of health workers toward immigrant patients in the utilization of health services at the Tamalanrea Health Center.

The population in this study was 154 people based on data in Tamalanrea Health Center in the past 6 months. In this study, the population was all immigrant patients seeking treatment at Tamalanrea Health Center more than once. The sampling technique in this study used purposive sampling in which this study took a sample based on certain considerations such as population characteristics or characteristics that were already known so that the number of samples was 59 people with inclusion criteria, namely, immigrant patients living in Puskesmas working areas Tamalanrea and have utilized health services for more than 1 visit.

Data collection is done by observation and questionnaire filling techniques. Data from the questionnaire filling were processed using the SPSS program.

Data analysis in quantitative research is carried out before entering the field, while in the field and after completion in the field. Data analysis was performed using the SPSS program.

Results

Table 1 shows the characteristics of the immigrant patients who were respondents in this study. Most of the respondents aged 26–36 years (44.1%), male sex (91.5%), the most recent education was the high school/equivalent category (44.1%), from the country with the most, namely, from Afghanistan (89.8%) with the most length of stay in Makassar for 5 years (28.8%).

Table 1: Characteristics of respondents in the Tamalanrea Health Center, 2019

Characteristics	n	%
Age (year)		
15–25	20	33.9
26–36	26	44.1
37–47	11	18.6
48–58	2	3.4
Gender		
Male	54	91.5
Female	5	8.5
Latest Education		
Not graduated elementary school	4	6.8
Elementary school	7	11.9
Junior high school	17	28.8
Senior high school	26	44.1
University	5	8.5
Country of origin		
Afghanistan	53	89.8
Ethiopia	1	1.7
Myanmar	2	3.4
Sudan	3	5.1
Long stay in Makassar (years)		
1	4	6.8
2	10	16.9
3	5	8.5
4	7	11.9
5	17	28.8
6	11	18.6
7	5	8.5

Table 2 shows that of the 39 respondents who stated the attitude of positive health workers as many as 25 people who had used health services, and as many as 14 people had not used health services whereas of the 20 respondents who stated the attitude of negative health workers as many as 20 people in the category had used health services and as many as 0 people who had not used health services at Tamalanrea Health Center.

Table 2: Attitudes of health workers with utilization of health services in Tamalanrea Health Center, 2019

The attitude of	Utilize		Not utilize		Total		p
health workers	n	%	n	%	n	%	
Positive	25	64.1	14	35.9	39	100.0	0,002
Negative	20	100.0	0	0.0	20	100.0	

Statistical test results in Table 2 obtained the value of p = 0.002 because the value of p <α = 0.000 <0.05 then Ho is rejected, this means that there is a relationship between the variables of the attitude of health workers with the utilization of health services in Tamalanrea Health Center.

Discussion

Based on the results of the study, a statistically significant correlation was obtained in the utilization of immigrant patients' health services at Tamalanrea Health Center.

The actions or methods of personnel performing services are those which greatly affect the patient in the use of services. Actions or ways of health workers in performing services are things that greatly affect patients related to the healing of the disease. The existence of good and attentive treatment becomes a special attraction in providing services to patients. This provides psychological strength for patients and fosters a motivation to utilize the services provided [7].

The attitude in the service of health workers is defined as the reaction or response of health workers/ nurses in performing health services accompanied by a tendency to take action on objects (patients) according to the needs of patients.

Attitudes can be demonstrated through three components of attitude, namely, cognitive, affective, and conative. In reality, patients as consumers are often sidelined or overlooked by service providers. From the patient's perspective, many complaints are submitted, and the patient's rights are not given enough attention regarding slow service, lack of friendliness, and lack of support facilities. Attitude is a mental and nervous state of readiness that is regulated through experience, which gives a dynamic or directed influence on individual responses to all objects and situations related to them [7].

The results of this study are in line with the results of research conducted by Wulandari and Saptaputra [8], which shows the results of the Chi-square statistical analysis, the value of p = 0.008 means that Ho is rejected Ha accepted. This indicates that there is a relationship between the attitude of the officers and the utilization of health services by the Langara community. Research conducted by Singal *et al*. [5] with the results of the test of the relationship between attitude and the use of Puskesmas by the Kima Bajo village community, the Chi-square statistical test results showed a value of p < 0.05 so it can be concluded that there is a relationship between attitude and utilization Puskesmas. Research conducted in the Kima Bajo village can be seen that attitudes associated with the use of health centers are because the community feels compatible with the services at the health center so that people choose to use the health center.

The results of this study are also in line with the results of research conducted by Rumengan *et al*. [7] which shows the results of the Chi-square test analysis obtained a probability value (Significance) of 0.000 (p < 0.05) with an error rate (α) 0.05, which means that there is a significant relationship between respondents' perceptions of staff actions and the use of health services at the Puskesmas. Judging from the value of the odds ratio, it shows that respondents with a perception of the actions of the officer are 8.5 times more likely to utilize health services at the Puskesmas.

According to Rumengan *et al*. [7], community perceptions of Puskesmas services need to be improved by providing continuous special training for health workers regarding illnesses or health problems in the community so that the alacrity and speed in overcoming these health problems are getting better. The limited ability and skills of health workers in the Community Health Center in dealing with diseases affect people's trust in treatment; for this reason, it is necessary to increase the ability and skills in health services to improve the performance of health workers.

Communication with patients about a service process that is being provided will give rise to positive perception and support themselves to be able to accept the actions given. The service that is responsive and supported by a friendly attitude and sincerity in responding to the problems faced is a matter of support and also determines success in health services and also affects the healing of patients.

Limited English proficiency does not only affect migrants' access to health services but also the quality of health services provided. In a Canadian study comparing the utilization of health services among refugees, immigrants, and the general population, refugees were found to use more services than immigrants but less than the general population. However, it is not known whether this difference is due to the characteristics of migrants, the host country, or the health care system. Future studies are needed in the US that focuses more specifically on Arab migrants [9].

The existence of good and attentive treatment becomes a special attraction in providing services to patients. This fosters psychological influence and motivation for patients to utilize the health services provided [10], [11], [12].

Conclusion

It was concluded that the attitude of health workers toward the utilization of health services for immigrant patients in general has a statistically

significant relationship. It is expected that the attitude of health workers can be maintained and further improved so that the utilization of health services by immigrant patients increases.

Recommendation

Suggestions for Tamalanrea Health Center to further enhance good attitudes to patients to create trust and satisfaction in utilizing health services in the Tamalanrea Health Center. It is hoped that further research can add new variables such as staff language proficiency or length of stay in Makassar in influencing the utilization of health services for immigrant patients at the Tamalanrea Health Center.

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Economic Status of Community Interest in Membership of BPJS Health in Duampanua District, Pinrang Regency

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Abstract

BACKGROUND: Starting from 2017 until 2019, the number of patient visiting public health centers Lampa is always more than the number of patient visits BPJS, it indicates that the public interest in District Duampanua, Pinrang Regency on BPJS Health membership is still lacking.

AIM: This study aimed to determine the effect of economic status on community interest in BPJS health membership.

METOHDS: This study used a quantitative research with cross-sectional study approach. The location of this research was in the District Duampanua, Pinrang Regency. The population in this study is the community in Duampanua District Pinrang Regency with 51.593 people. The sampling technique in this study used a purposive sampling technique with 100 sample size. Data analysis performed was univariate and bivariate with Chi-square test.

RESULTS: The results showed that there are influence of economic status variables (p = 0.016) to community interest in BPJS Health membership in Duampanua District, Pinrang Regency. The conclusion of this study is that there is an influence of economic status on community interest in BPJS Health membership because the higher the economic status of the community, the higher their interest in BPJS Health membership.

CONCLUSION: It is expected that stakeholders in each village in the Duampanua District can find out the income of the community by conducting data collection evenly as proof of their worthiness of being members of JKN-KIS participants.

Introduction

Since 2014, the Indonesian government has made a commitment to provide health insurance coverage for all people through a public health insurance system, compulsory namely the issuance of a Law on the Social Security Organizing Agency (BPJS). BPJS implementation is an effort to increase insurance coverage for services health in Indonesia [1].

One of the missions of the Health Social Security Organizing Agency is to expand JKN membership to include all Indonesian citizens no later than January 1, 2019 through increasing partnerships with all stakeholders and encouraging participation community and increasing membership compliance. In addition, the BPJS Health target is that the entire population of Indonesia (which in 2019 is estimated to be around 257.7 million people) gets health insurance through the BPJS Health [2]. Efforts to encourage participation public to achieve Universal Health Coverage (UHC) means that all Indonesian citizens must be registered as JKN participants, it is important for all sectors to support and make various efforts so that all Indonesian citizens are registered as JKN participants through proof of JKN card ownership [3].

UHC has become a major goal of health reform in many countries. Funding is the main driver of UHC and many countries including low- and middle-income countries are looking for better options to modify their health financing systems to support the realization of UHC [4].

Starting from 2017 until 2019, the number of patients visiting public health centers Lampa is always more than the number of patient visits BPJS, it indicates that the public interest in the District Duampanua, Pinrang Regency on BPJS Health membership is still lacking. During the 5 years of the JKN program, not all Indonesians have been protected by JKN. This can be seen from the data on the number of BPJS Health participants. Nationally, the number of BPJS Health participants until June 1, 2019 totaling 222,002,996 people (82.53%) of Indonesia's population has participated in national health insurance from a total population of around 269,536,482 people. Membership coverage for South Sulawesi Province until 2019 was 9,400,000 people registered as participants of the BPJS Health. For Pinrang Regency, the number of BPJS participants until 2019 was 217,432. The phenomenon is seen in the field, BPJS Health is not optimal in increasing the number of participants JKN in Duampanua District, Pinrang Regency [5].

There are various things that can influence the community to want to become JKN participants, both in terms of the characteristics and perceptions of the community of JKN, especially those who have not been participants in the national health insurance before. Based on research conducted by Endartiwi, it was stated that the factors affecting the community were still reluctant to register to become independent BPJS participants due to economic factors, lack of information, and indeed they were not yet interested in registering to become BPJS participants independently [6].

Other research conducted by Pebrian shows that the problem that causes the low interest of the community to register for JKN is because there are still many people who do not understand the rules and procedures for getting services from BPJS Health. The public does not understand BPJS Health rules and procedures. The lack of public knowledge is caused by the lack of direct socialization to the public about the Health BPJS so that many people in Siak Regency are still not registered [7].

Research by Adewole *et al*. states that poor health insurance performance in Nigeria is largely due to low public awareness of the importance of being a participant in health insurance. Factors such as age, marital status, education, and residence are some of the demographic factors that influence people's awareness to register for health insurance participants [8].

The results of initial observations made in Duampanua District can be seen that there are still many people who have not yet become BPJS health participants, especially BPJS participants it is independent because the community income is not enough, while they have many other needs to be fulfilled such as children's education costs, daily needs, and so forth. In addition, the public thought that if they become independent BPJS participants, it is as if they are throwing money away for nothing because their money is not returned like insurance other. The purpose of this study was to determine the factors that influence interest community in BPJS Health membership in Duampanua District, Pinrang Regency.

Materials and Methods

This study was conducted in Duampanua District, Pinrang Regency. This type of research used in this research is quantitative research with a cross-sectional study approach.

Collection is done by distributing questionnaires to respondents that contain a list of questions. Secondary data were obtained from the Puskesmas, namely, from the profile Community Health Centers, the Population and Civil Registry Office, and the Insurance Administering Agency Health of the Pinrang Regency.

Analysis used in this study is univariate and bivariate. Univariate analysis is an analysis that reveals the personal data respondents, obtained from respondents answers through a questionnaire. This bivariate analysis was conducted to find out each independent variable with the dependent variable of the study with cross tabulation and test Chi-square.

Results

Table 1 shows the characteristics of respondents based on age, sex, last education, occupation, and income per month. Based on the age characteristics, the highest number of respondents was in the age group of 41–50 years as many as 46 people (46.0%), while the number of respondents was the least in the age group of 51–60 years which was as many as 5 people (5.0%). Based on gender, the highest number of respondents was male, namely 53 people (53.0%), while sex female was 47 people (47.0%). Based on the recent education, the respondents were most the high school/equivalent level of 44 people (44.0%), while the fewest respondents did not complete elementary school, namely as many as 2 people (2.0%). Based on the work, the most number of respondents were housewives (IRT) as many as 22 people (22.0%), while the fewest respondents were students/college students, as many as 7 people (7.0%). Based on income per month, the highest number of respondents is <Rp. 1,500,000, which is 70 people (70.0%), while the lowest number of respondents is Rp 1,500,000–2,500,000, which is 8 people (8.0%).

Table 1: Characteristics of respondents in Duampanua District, Pinrang Regency in 2019

Characteristics of respondents	Category	Frequency	
		n	%
Age	19 – 29	27	27.0
	30 – 40	22	22.0
	41 – 50	46	46.0
	51 – 60	5	5.0
Gender	Male	53	53.0
	Female	47	47.0
Last education	Not graduated from elementary school	2	2.0
	Elementary school/equivalent	12	12.0
	Junior high school/equivalent	20	20.0
	High school/equivalent	44	44.0
	University	22	22.0
Occupation	Student/college student	7	
	Civil servants/military/police	8	8.0
	Entrepreneurs	14	14.0
	Laborers	17	17.0
	Housewife (IRT)	22	22.0
	Farmers	18	18.0
	Private employees	12	12.0
	Others	2	2.0
Income per month	<Rp 1.500.000	70	70.0
	Rp 1.500.000 – 2.500.000	8	8.0
	>Rp 3.500.000	22	22.0

Table 2 shows that of 100 respondents in Duampanua District, Pinrang Regency from the economic status, there were 69 people (69.0%) who

Table 2: Univariate analysis of respondents distribution based on economic status variables in Duampanua District, Pinrang Regency in 2019

Variables	n	%
Economic status		
High	31	31.0
Low	69	69.0

stated that the economic status was high and 31 people (31.0%) stated that the economic status was low.

Table 3 shows that of 100 respondents classified as high economic status and interest high, 19 people (61.3%) and those who have high economic status and low interest as many as 12 people (38.7%). While respondents classified as low economic status and high interest were 23 people (33.3%) and those classified as low economic status and low interest were 46 people (66.7%). Statistical test results obtained the value of p = 0.016 because the value of p <α = 0.016 <0.05 then Ho is rejected, this means that there is an influence between economic status variables with community interest in BPJS Health membership in Duampanua District, Pinrang Regency.

Table 3: Bivariate analysis of the effect of economic status on community interest in BPJS health participation in Duampanua district, Pinrang Regency in 2019

Variable	Interest				Total		Statistical test results
	High		Low				
	n	%	n	%	n	%	
Economic status							
High	19	61.3	12	38.7	31	100.0	p = 0.016
Low	23	33.3	46	66.7	69	100.0	

Discussion

The results of the study indicate that the economic status variable has significant influence on community interest in BPJS Health membership in Duampanua District, Pinrang Regency.

The higher the economic status of the community, the higher their interest in BPJS Health membership is.

Economic status is related to income family, with a good enough income, in fulfilling the needs of life and health, they will be more secure and the funds for health costs they have prepared. While people who have low incomes are very afraid of the cost of treatment because they do not have enough money and the high cost of drugs that must be purchased [9]. The higher one's economic status, the higher the willingness to pay and the willingness to pay for people in urban areas is higher than semi-urban areas, and rural areas [10].

The results of this study are in line with the results of research conducted by Johariyah [11] which states that there is a significant relationship between economic status and independent BPJS participation in obstetric patients in Cilacap Hospital 2016. The higher one's income, the higher public awareness in insurance is. Likewise research conducted by Kuwawenaruwa *et al*. [12] which states that the willingness of people in Tanzania to become participants in health insurance is influenced by economic factors. The economic factor in question is family income with status low economic. People with low economic status tend to be unwilling to join health insurance so they are considered for cross subsidies and fee waivers for them. Other research conducted by Lofgren *et al*. [13] in Vietnam states that a person's income to meet the needs for health care is a significant determinant that can influence households to be willing to become participants of health insurance.

The results of this study are also in line with the results of research conducted by Untari and Putri [14] stating that the relationship between the family's socioeconomic level and BPJS ownership shows that there is a significant relationship between the socioeconomic level of the family and BPJS ownership (p = 0.000<0.05) and the correlation is 0.471. The data show that BPJS has the majority of families with low socioeconomic levels, including PBI, so they do not pay fees but are funded by the government. In the middle economic community that has BPJS only 52 respondents of 65 respondents (80%), whereas in families with socioeconomic level upper only 12 respondents of 48 respondents (25%). Hence, it can be concluded that the level of public awareness there is still low to participate in BPJS membership.

Another study conducted by Onwujekwe *et al*. [10] states that there is a significant relationship between economic status with the willingness of people to become participants in the Community-based Health Insurance (CBHI) where economic status is a factor that greatly affects the willingness to pay the respondent and membership CBHI. In general, <40% of respondents are willing to pay CBHI contributions for themselves or their members family. The lowest proportion of people's willingness to pay occurs in respondents living in rural areas, which is <7%.

However, the results of this study are not in line with the results of research conducted by Pangestika *et al*. [15] which states that the results of the test Chi-square show that no there is relationship between income and BPJS Health Mandiri membership in the sector informal. The value of p = 0.050 ≥ 0.05 then Ha is rejected, so there is no relationship between income and BPJS Health Mandiri membership in the informal sector.

Based on the interview results from the questionnaire questions, there are still some indicators on economic status variables that indicate community interest in membership BPJS Health such as the question item "Your income influences participation insurance" where people with low income agree to the item as much as 58% which means income or income is a factor that influences community interest in participating in BPJS health participants.

People with low incomes tend to be unwilling to become BPJS health participants because the income they earn in a month is only enough to meet their daily needs as in the item "Following BPJS health does not interfere with my income results to meet daily needs" where as many as 54% which states that they disagree, which means that following BPJS Health disrupts their income to meet their daily needs. Whereas for people who have a high income, the community prefers to be a public patient because according to the community in Duampanua District, the service they get is almost the same as the service obtained by BPJS Health participants, the difference is that general patients only pay when they are treated compared to independent BPJS participants who must pay per month according to the class and this is the reason they are not interested in becoming BPJS Health participants.

The problem in the field is that public awareness of participation in BPJS health is still low. In addition, the community still considers the costs for BPJS, especially the Mandiri BPJS expensive, with the average income of the Duampanua District being <Rp. 1,500,000 per month with the majority of jobs being farmers, so this is not a big number to share in meeting their daily needs. Of course, this is one of the community's considerations in determining participation in the BPJS program, especially the independent BPJS.

Economic status is related to family income, with an enough income good, in fulfilling the needs of life and health, they will be more secure and the funds for health costs they have prepared. While people who have incomes low are very afraid of the cost of treatment because they do not have enough money and the high cost of drugs that must be purchased [9]. The higher economic status one's, the higher the willingness to pay and the willingness to pay for people in urban areas is higher than semi-urban areas, and rural areas [10]. High income residents, with their own awareness, will use health insurance for themselves and their families [16].

A measure of one's wealth income will affect insurance participation. They are willing to pay more for health insurance for those who have more income. Moreover, vice versa for those with little income certainly will affect the consideration for having insurance [17].

According to Dalaba *et al*. (2012) states that registration is higher in the group high income in accordance with consumer theory which considers health insurance as an item with positive elasticity of demand. Likewise, according to Sarpong *et al*. [18] states that health insurance registration is generally higher in people from higher socioeconomic groups.

Recommendation

It is expected that BPJS Health agencies conduct socialization activities in Duampanua District regarding the importance of participating in the current program BPJS health. For stakeholders in Duampanua District both in villages and villages to find out the income of their citizens by collecting data evenly and visiting the residents homes as proof of their appropriateness to be given assistance National Health Insurance-Healthy Indonesian Card (JKN-KIS).

Conclusion

It is expected that stakeholders in each village in the Duampanua District can find out the income of the community by conducting data collection evenly as proof of their worthiness of being members of JKN-KIS participants.

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The Legislative Role of Universal Health Coverage Achievement in Kolaka Regency

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Abstract

BACKGROUND: The legislative role intended in accordance with the mandate of law number 17 of 2014 concerning the MPR, DPR, DPD, and DPRD in article 365 mentions three functions of the DPRD, namely, legislation, budgeting, and supervision.

AIM: This study aimed to determine the legislative role in the achievement of Universal Health Coverage (UHC) in Kolaka Regency.

METOHDS: This research method uses a qualitative with four informants selected by accidental sampling. Data obtained through in-depth interviews, observation, and document review. Data triangulation analysis is used to obtain data validity.

RESULTS: The results showed that the role of the legislature in the legislative function had not been carried out properly because there were no regional regulations issued by the district government of Kolaka who supports the achievement of UHC and will only conduct academic studies related to JKN, the budgeting function has been carried out well because of Commission III of the District Parliament of Kolaka has provided full support regarding budgeting in the health sector and the oversight function is also well implemented. Parliamentary budget oversight in Kolaka is carried out 3 times a year/per quarter by the DPRD in collaboration with the inspectorate, BPK and APIP by comparing planning with reality on the ground. It was concluded that the legislative role in the achievement of UHC in Kolaka was not fully functioning properly.

CONCLUSION: It is expected to immediately formulate and issue regional regulations that support the implementation of the JKN program as a manifestation of the achievement of UHC in Kolaka and involve academic experts in UHC/JKN in formulating the regional regulation.

Introduction

The percentage of population guaranteed, services guaranteed and a large proportion of the direct costs still borne by the population are three dimensions formulated by the WHO in achieving universal coverage. Potential protective financial risk and access to care that is needed is two main objectives Universal Health Coverage (UHC). UHC also includes objectives related to equitable access, quality services, and broader social protection [1], [2].

The achievement of the UHC was supported by various factors including the BPJS, the Regional Government and the DPRD itself. Legislative role against UHC form of check and balances means the balance as well as the lack of oversight of the authority and will be given. The mechanism of checks and balances can improve the relationship between executive and legislative in realizing good governance [3].

Based on research Hoang *et al*. [4] in Vietnam, various levels of support from stakeholders affect the formulation and implementation of health insurance. With government financial subsidies, the involvement of various stakeholders, political commitment, and flexible working mechanisms among the stakeholders, proves that the issue of health insurance is not only a technical aspect of the health system but also a socioeconomic and broader governance problem.

Act of the National Social Security in 2004 to consider the entire population coverage through the National Health Insurance (JKN), a mandatory program that evolved from the existing insurance program [5]. Based on national data, currently JKN-KIS participants in Indonesia have increased from 2014 to 2019 with the number of participants as of July 1, 2019, totaling 222,463,022 million or around 86% of the population. While in Kolaka Regency is inversely proportional to the target that has been set even decreased, namely, the number of JKN as of December 31, 2018, totaling 217,786 inhabitants with coverage of 83.8% and as of June 30, 2019, totaling 233,159 people experienced a decrease with coverage of 83.2%, from the results of these data

show that Kolaka Regency has not yet reached the UHC dated January 1, 2019, and this is not in line with the President's instructions No. 8 of 2017 concerning the optimization of the implementation of the national health insurance program. This shows the seriousness of the regional government and especially the DPRD in achieving the UHC in Kolaka Regency.

From the results of the background of the above problems, the aims of this study are to determine the role of the legislative in particular functions of legislation, budgeting, and monitoring to the achievement of UHC yet achieved UHC in Kolaka Regency.

Materials and Methods

The study was conducted in Kolaka Regency on November 25 to December 6, 2019. This research was conducted using qualitative methods that have the aim to describe and understand the factors related to the role of the People's Representative Council on the achievement of the Universal Health Coverage (UHC) by looking at the making of three functions of the DPRD, namely, Legislation, Budgeting, and Supervision in Kolaka Regency.

Accidental sampling is a technique of determining samples based on chance that consumers who incidentally/incidentally meet with researchers can be used as samples, if it is seen that people who happen to be met are suitable as data sources. Informants in this study as many as four persons, namely, three Commission III of the DPRD Kolaka period from 2014 to 2019 and head of the healthcare in Kolaka Regency, with criteria have served a minimum of 6 months, healthy body and can communicate fluently and willing to become an informant by signing informed consent.

Data collection is collected by in-depth interviews, observations, and document review. The legislation is done by the method of document review and observation, while budgeting and supervision are carried out by the method of in-depth interviews and document review.

Data collection is collected by in-depth interviews, observations, and document review. Data analysis in qualitative research was conducted before entering the field, during the field, and after its completion in the field. Data analysis was performed using the version of Miles and Huberman that the activities in qualitative data analysis were carried out interactively and continued continuously until it was completed so that the data were saturated. Activities include data reduction, data display, and verification.

Results

Table 1 shows the names of the members of Commission III in the Field of Development and Welfare of the DPRD of Kolaka Regency as many as 11 people, of which the Gerindra was as much as 1 chair of the commission, PKS as much as 2 seats with the AKD as the deputy chairman and member, the Golkar as much as 1 seat as a secretary and the PAN, HANURA, PKB, PDIP, PKS, and PBB, respectively, as members of Commission III in the Development of the DPRD Kolaka Regency Period of 2014–2019.

Table 1: Data on board completeness tools (AKD) Commission III development and welfare members of the Kolaka Regency DPRD for the 2014–2019 period

Name	AKD structure	Fraction
Ir. Syaifullah Halik	Chairman	Gerindra
Ahmar S.Sos	Vice-Chairman	PKS
H. Mustafa SE	Secretary	Golkar
Muh. Ajib Madjib, SE	Member	PAN
Hasbi Mustafa, SH	Member	Hanura
Drs. Handra, SH	Member	PKB
Hj. Jariah	Member	PPP
Edi Hariyono. Sp	Member	PDIP
Syarifuddin Baso Rantegau	Member	PDIP
Rusman, SH	Member	PKS
Muh. Gassing, SS	Member	PBB

Characteristics of the informants in this study are presented in Table 2, where all informants are in the age range ranging from 46 to 52 years with educational background S1 to S2.

Table 2: Characteristics of informants in-depth interview about the role of the legislature towards the achievement of UHC in the Kolaka Regency, 2019

Initial	Age (years)	Education	Position
SH	46	S1	Chairman of Commission III of the Gerindra Faction DPRD
HM	52	S1	Member of Commission III DPRD Hanura Faction
AM	47	S1	Member of Commission III DPRD PAN faction
AR	50	S2	Head of Health Services, Kolaka Health Service

Legislation

Based on the results of in-depth interviews about the role of the DPRD in the legislative function, it can be seen that the DPRD does not yet have regional regulations that support the achievement of UHC in Kolaka Regency because DPRD is still doing academic studies related to UHC. The following is the statement of the informant:

> "*… Surely the JKN this is the program nationwide that do government central of course we are in the area will do things like that, until the moment it does not exist regulatory regions are related or support in achieving UHC in Kolaka Regency. We at the DPRD will conduct academic studies related to the achievement of UHC in Kolaka Regency tp fulfill the healthy rights of the Kolaka Regency as a whole.*" (SH, 46, Chair of Commission III DPRD Gerindra Faction).

The statement was then supported by informants from other DPRD members who said that there was no regional regulation regarding JKN:

> "… *Indeed, it is necessary to have local regulations in support of the JKN national program, specifically in the Kolaka Regency there are no local regulations relating to JKN, we DPRD will certainly work to give birth to policies or regulations which then have a wide impact on the community specifically about This JKN.*" (HM, 52, Member of Commission III DPRD Hanura Faction).

Then, an additional statement from the informant said that this time in Kolaka *Regency,* there is only an agreement in the form of an MoU between the Health Office and the Regency Health BPJS Kolaka. The following is the statement of the informant:

> "… *The relationship between the regional government and the DPRD Kolaka is very synergized in running the wheels of government, but until now local regulations related to supporting the achievement of universal health coverage have not yet existed in the Kolaka, only in the form of an MoU with the Regency Health Office Kolaka with BPJS Health Regency in Kolaka.*" (AR, 50, Head of Health Services, Kolaka Health Office).

Based on the results of interviews with informants and observations made, it can be seen that there are no regional regulations issued by the Kolaka Regency government that support UHC achievement because they are still conducting academic studies related to JKN and there is only an agreement in the form of an MoU between the Regency Health Office Kolaka and Kolaka BPJS Regency Health so that the legislative role in the legislative function on the achievement of UHC in Kolaka Regency has not been implemented properly because there are no regional regulations governing JKN in terms of achieving UHC.

Budgeting

Information wants to know from budgeting is about the legislative role in support of the process of budgeting government area, which is associated with JKN and the amount of budget that issued government area of health, especially financing of participants JKN. The following is the statement of the informant regarding his role in supporting the budgeting process:

> "… *Regarding our budgeting in the DPRD, of course, prioritizing the budget in the field of Health, of course, we fully support that regarding the health budget, because it is also in the management of health budgets that relevant parties are able to target the community according to the programs that will be carried out later.*" (SH, 46, Chair of Commission III DPRD of the Gerindra Faction).

Based on this statement, the chairman of the Commission III of the District Parliament Kolaka supports and prioritizes the budget for the health sector and hopes that the budget can be targeted to the people who need it. The informant further said that while serving in Commission III, the DPRD synergized well with the local government regarding health budgeting because it involved the wider community. The following is the statement of the informant:

> "… *When I was a member of Commission III for the 2014–2019 period, we at the DPRD worked well with local governments in the health sector, of course, in our position of health support was because it was about the wider community*." (HM, 52, Member of Commission III DPRD Hanura Faction).

Then, the informant further said his hopes to increase the amount of the health budget in the 2019–2024 period.

> "… *Even our Commission III Member of Kolaka DPRD yesterday responded very well related to the health budget. In fact, I hope that the health budget in the 2019-2024 period can be added again.*" (AM, 47, Member of Commission III DPRD PAN Faction).

Regarding the number of APBDs issued by the local government for health, especially for JKN participants, the three DPRD informants were not sure of the total budget for JKN participants. The following statement:

> "… *As for the exact number, I also forgot a bit, but that is according to the discussion at the plenary session yesterday, then just check it directly at the health office*." (SH, 46, Chair of Commission III DPRD Gerindra Faction).
>
> "… *If the exact numbers are listed, then check directly the Health Office.*" (HM, 52, Member of Commission III DPRD Hanura Faction).
>
> "… *I forgot the exact number, immediately checked or asked for the real number at the health office.*" (AM, 47, Member of Commission III DPRD Faction PAN).

For the amount of JKN budget, here is a direct statement from the informant at the Health Office:

> "… *The JKN budget from 2014 to 2019 continues to increase, of course, this is a form of synergy between the regional government and the DPRD in supporting the JKN program, later I will provide regional expenditure budget related to national health insurance consisting of the regional premium budget, JKN, and management from 2014–2019, for 2019 the number of APBDs for JKN is approximately 19 billion.*" (AR, 50, Head of Health Services, Kolaka Health Office).

Based on the results of interviews on budgeting, Commission III DPRD of Kolaka Regency gave full support regarding budgeting in the health

sector because health concerns the wider community, evidenced by the continued increase in the number of APBDs issued for JKN from 2014 to 2019 which reached 19 M in 2019.

Supervision

Information to be known from the supervision is about the role of DPRD in overseeing the budget for JKN. The following is the statement of the informant:

> "… *In overseeing the budget in supporting JKN, this is one of our functions in the DPRD, of course, we convey and remind that in implementing health programs it must be right on target for the people who really need it, also related to JKN-KIS recipients or the community poor we are also in the DPRD somewhat confused about the data we want to refer to where? Is it in BPS or the Social Service? Because each of the different agencies issued data so that we are also confused where to refer, we hope that the local government in managing the data of the poor is just one door so that we refer there only so that the implementation is right on target. For budget oversight, it is carried out normatively 3 times with stages 1, quarter 2 and quarter 3, but in conducting our supervision in the Kolaka DPRD, we often do well at the health center to hospital-level by looking at the comparison between planning and realization in the field set by the government. central, provincial and district governments as monitoring material by commission III, while the Inspectorate, BPK (Financial Supervisory Agency), and APIP (Government Internal Supervisory Apparatus) also conduct their own supervision and sometimes also the friends of the BPK submit suggestions if there are problems about JKN while examples of problems that often occur in the field are long queuing problems when health services so that we in the DPRD hold a Hearing Meeting (RDP) with the Health Service or related agencies in completing health services especially about this JKN problem.*" (SH, 46, Chair Commission III DPRD Gerindra Faction).

Based on interviews with the Chairperson of Commission III of the Gerindra Faction DPRD, the informant stated that budget oversight in supporting JKN had been carried out, but there was no clear data reference yet on the number of poor people in Kolaka because there are differences in the amount of data from BPS and the social service. The informant hopes that in managing the data of the poor, the population will be integrated so that the implementation of the JKN program primarily to finance PBI participants can run effectively and efficiently. Budget monitoring is carried out 3 times a year/per quarter by the DPRD in collaboration with the inspectorate, BPK, and APIP by comparing planning with reality on the ground.

The statement was supported by a statement from an informant from the Health Office who said that differences in data from the Social Service and BPS were one of the causes of the decrease in the number of membership coverage. The following is the statement of the informant:

> "… *Correct membership data released by the Health Service as of December 31, 2018, were 217,786 people with coverage of 83.8% and as of June 30, 2019, as many as 233,159 people experienced a decrease with coverage of 83.2% of this membership having decreased by several these factors include the existence of people having a double card, people who have moved areas and people who have died.*" (AR, 50, Head of Health Services, Kolaka Health Office).

The informant went onto say that the DPRD Kolaka as a legislative body, has carried out its function in overseeing budget management and was included in the priority scale of discussion in the Kolaka Regency Parliament. The following is the statement of the informant:

> "… *I am a member of the Regional Parliament of Kolaka 2014–2019, and we with the regional government are very well partnered in realizing the welfare of the Kolaka Regency. Regarding the budget management oversight for UHC, especially JKN participant budget, we input the priority scale of discussion at the Regional Parliament yesterday. We strongly support that. And thank God the management went well according to the determined SOP.*" (HM, 52, Member of Commission III DPRD Hanura Faction).

The next statement regarding supervision, the informant said that the Kolaka Regency Parliament has budgeted according to the submission from the local government, especially in the health sector, and plans to add a budget for the health sector and formulate regional regulations through academic studies in support of the JKN program in the Regency. Kolaka. The following is the statement of the informant:

> "… *Regarding local regulations, God willing, we will conduct academic studies in formulating or making regional regulations in support of JKN in the Kolaka Regency. Later and regarding the budgeting in the health sector, especially JKN we have budgeted enough in accordance with the submission of the local government, and even we plan to add more health budgeting for the health rights of the community in the Kolaka regency.*" (AM, 47, Member of Commission III DPRD PAN Faction).

Based on the results of interviews regarding supervision, it can be seen that the District Parliament

Kolaka has conducted oversight of the budget in the field of health, especially in the JKN program. However, for budgeting PBI, participants are still experiencing problems due to differences in poor community data released by BPS and the District Social Service. Kolaka. This has become one of the causes of the decline in JKN membership coverage, namely, the existence of a double card community, people who have moved areas, and people who have died. Parliamentary budget oversight Kab. Kolaka is carried out 3 times a year/per quarter by the DPRD in collaboration with the inspectorate, BPK, and APIP by comparing planning with reality on the ground.

Discussion

This research was conducted to determine the role of the legislature, namely, legislation, budgeting, and supervision of the achievement of UHC in Kolaka Regency. Researchers discuss the results of research by analyzing these data and comparing with theories and the results of previous studies; this is to find out more research results obtained from research informant statements and after data reduction and data presentation. The discussion of each variable is stated as follows:

Legislation

Based on the results of the study, it can be seen that there are no local regulations issued by the Kolaka district government who supports the achievement of UHC because DPRD Kolaka will only conduct an academic study related to JKN and there is only an agreement in the form of an MoU between the District Health Office of Kolaka and BPJS District Health of Kolaka.

The function of legislation to form local regulations is the main function of the Regency/DPRD as a regional legislative body. The function of making local regulations is the main and original function of the DPRD as a legislative body. Through this function, Regency/City DPRDs can show their color and character and quality, both materially and functionally. This legislative function is attached to the DPRD as the DPRD is a representative institution of the people [6].

This research is then not in line with research conducted by Rismawan [7] in Palu City, which states that the provisions of the policies are carried out in general that the process of implementing the health insurance financing policy of the City of Palu in the JKN era was successfully implemented. The regional health insurance financing policy is a top-down policy from the central government to regional governments that consciously and with high commitment can be realized by the Palu City Government, both in the form of providing contribution assistance for JKN participants registered by the city government (PBI APBD) as well as several service activity programs health that has been implemented.

Budgeting

Based on the results of the study, Commission III of the District Parliament, Kolaka, has given full support regarding budgeting in the health sector because he is aware that health concerns the wider community. The amount of the budget for the JKN program from 2014, which was as much as Rp10,943,598,400, continued to increase until 2018 to Rp20,214,078,501 and experienced a slight decrease in 2019 to Rp19,837,977,100.

Increasing the amount of the budget each year shows that the district government Kolaka continues to improve and support the achievement of UHC, especially in increasing the amount of the budget. This shows that the DPRD and local governments are actively and jointly involved in increasing the JKN program budget.

The health budget is part of the national budget allocated to the health sector, including all ministries and institutions related to health activities. The health budget allocates national funds to the sector, states the country's key financial goals, and represents a health policy commitment and strategy implementation [8].

In addition to providing the budget, the next thing to note is that the utilization of the budget is in accordance with its purpose or not. Supriantoro [9] in his research stated that for budget readiness, it involved very large state and regional funding, but the effectiveness of its use was highly considered, especially in terms of financing, so that in the end the services received by the community would be even greater and targeted.

This research is also in line with research conducted by Timumun [10], which states that the management of the National Health Insurance program in terms of the provision of funds is more effective, but in terms of utilization of the budget has not been effective.

This shows that the regional government, especially the DPRD must always oversee the budget that has been issued, not only limited to providing funds so that the budget will have an impact on improving the JKN program and its benefits are felt by the wider community.

Supervision

Based on the results of the study, it is known that the District Parliament Kolaka has conducted oversight of the budget in the field of health, especially in the JKN program. However, it has not yet implemented supervision in the area of regional regulations because there are no regional regulations regarding the JKN program. Parliamentary budget oversight Kolaka

is done 3 times a year/per quarter by the DPRD in collaboration with the inspectorate, BPK, and APIP by comparing planning with reality on the ground.

This research is in line with research conducted by Sahri [11] in Bangkalan, which stated that the implementation of the oversight function of the District Parliament. Bangkalan on the implementation of the Jamkesda program in Kab. Bangkalan is not yet optimal due to the absence of regional regulations that specifically regulate Jamkesda.

The absence of regional regulations that specifically regulate JKN is an indication of the weak oversight of the District Parliament. Kolaka on the implementation of the supervisory function related to JKN. How does DPRD Kolaka can conduct supervision well, if there is no local regulation that specifically regulates the implementation of JKN in Kolaka. The fact that there are no regional regulations that specifically regulate JKN makes the DPRD Kolaka does not have a firm legal umbrella, especially in the level of regional regulations as a reference to carry out the supervisory function, even though local regulations related to JKN are absolutely needed, in addition to being a legal basis it also becomes a reference for the DPRD Kolaka to be free to supervise if there are policies that conflict with these regional regulations.

Constraints found by the District Parliament, Kolaka and District Health Office. Kolaka, namely, the differences in data on the poor are issued by BPS and the Kolaka District Social Service. This has become one of the causes of the decline in JKN membership coverage, namely, the existence of a double card community, people who have moved areas, and people who have died [12].

Recommendation

It is recommended to immediately formulate and issue regional regulations that support the implementation of the JKN program as a manifestation of the achievement of UHC in Kolaka and involve academic experts in UHC/JKN in formulating the regional regulation. It is hoped that further research can explore further the factors that influence community interest in becoming JKN-KIS participants, as well as UHC achievements from the BPJS Health aspect.

Conclusion

It is expected to immediately formulate and issue regional regulations that support the implementation of the JKN program as a manifestation of the achievement of UHC in Kolaka and involve academic experts in UHC/JKN in formulating the regional regulation.

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Correlation of Age, Gender, and Employment Status with Quality of Life Glaucoma Patient

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Abstract

BACKGROUND: People with glaucoma sometimes do not feel the symptoms of glaucoma until the end of the stage, so the risk of blindness will be even greater. Glaucoma is a form of visual impairment, also the second cause of blindness after cataracts. However, in contrast to cataracts, glaucoma cannot be cured through surgery so that the blindness experienced is permanent.

AIM: This study aimed to determine the relationship between the characteristics of respondents (age, gender, and occupational status) and the quality of life of glaucoma patients.

METHODS: This study used quantitative research with cross-sectional method. Interviews were conducted on 250 glaucoma patients at community eye health centers. To determine age, sex, and employment status related to quality of life, the data were analyzed using Chi-square and logistic regression.

RESULTS: The age with p-value 0668 and gender with p-value employment status in 0237 and 0105 with p values were not related to the quality of life of glaucoma patients. The results of logistic regression analysis showed that the employment status with a significance of 0046 was a factor related to the quality of life.

CONCLUSION: No relation to gender, age, and income with the quality of life of patients with glaucoma in Makassar Community Eye Health Centers in 2018 was found.

Introduction

Some glaucoma patients do not feel the symptoms of glaucoma until the end of the stage so that the risk of blindness will be even greater. Glaucoma is one form of visual impairment, also the second leading cause of blindness after cataract. However, unlike cataracts, glaucoma cannot be cured through surgery, thus suffered permanent blindness.

Glaucoma is a disease that damages the optic nerve so that the disruption of some or all of the visual field caused by high eye pressure someone, usually due to the barrier discharge eye (aqueous humor) [1]. The mechanism of the increase in intraocular pressure in glaucoma is a disorder aqueous humor outflow due to abnormalities of the anterior drainage system of the camera angle (open-angle glaucoma) or aqueous humor access to the drainage system.

The wider community of glaucoma do not know it, so it tends to ignore the symptoms. Glaucoma often develops without any symptoms or risk factors which are evident. Yet with intensive and regular treatment can reduce the pressure on the eyeball, thus slowing the occurrence of blindness.

Results of global data on visual impairment 2010 state the cause of visual impairment around the world that most refractive errors were not corrected, followed by cataract and glaucoma. Amounted to 18.0% cannot be determined, and 1% is vision disorders since childhood [2]. Glaucoma is a leading cause of blindness that cannot be cured globally. There are about 60.5 million people infected with primary open-angle glaucoma and primary angle-closure glaucoma (primary-closed angle glaucoma) of 2010 [3].

According to epidemiological studies, the prevalence of glaucoma is highest in Germany by 14%, and the second is Northern Europe (Russia) as much as 11.9%. The lowest prevalence is that France is 3.4%. Studies conducted in Spain showed that the prevalence of primary open-angle glaucoma is more prevalent in males is 2.4% compared to women is 1.7%. These results are consistent with studies conducted in Germany that suggests that the incidence of glaucoma is higher in men (6.64%) than in women (2.96%). The number of blind people in Western Europe are 956 000 101 300 (10.6%) who had glaucoma [4].

Quality of life was rated as the individual's perception of their position in life according to the culture and values in life. Quality of life is influenced by physical health, psychological health, level of independence, social relationships, trust, and relationship with the environment [5]. Some have suggested that there are various factors that affect the quality of life of patients with glaucoma. These factors, among others are: education, knowledge, age, gender, occupation, length of illness, medical history, the severity, the sharpness of the eyes, wide field of view, a history of the disease, family history, and intraocular pressure.

Materials and Methods

This research was conducted at the Community Eye Health Center Makassar South Sulawesi. This type of research is observational using cross-sectional design.

The population of this research is all glaucoma patients who visit Makassar Community Eye Health Center in December 2017, January, and February 2018, which is in the process of treatment. The samples 224 selected by simple random sampling during the study managed to get a sample of 250 patients with glaucoma. The research sample of respondents who agreed to be interviewed by the signed informed consent has been issued by the Ethics Committee of the Faculty of Public Health, University of Hasanuddin.

Data collected through interviews to obtain data on age, sex, and employment status. Data quality of life obtained using a questionnaire from the National Eye Institute Visual Function - Questionnaire. Demographic data glaucoma patients in getting through direct interviews using a questionnaire.

Data analysis was performed using the Statistical Package for the Social Science version 20. The chi-square test was used to test the relationship between independent and dependent variables. Statistical significance was accepted at the 95% confidence level. Logistic regression analysis was performed to identify factors associated with quality of life. Analysis of the variables with $p < 0.25$ included in the logistic regression model analysis using the enter key to identify factors that can significantly affect the quality of life of patients with glaucoma.

Results

Glaucoma patients with good quality of life are 89.6% (224) and with a poor quality of life is 10.4% (26) (Table 1). The results of the bivariate analysis showed that more male with glaucoma with a high quality of life are 128 respondents (92.3%) while the female sex with a good quality of life are 87.7% (128). Patients with ≤ 57 years of age with glaucoma and a high quality of life is 90.6% (96) of respondents, while in the age group >57 years, were 88.9% (128) of respondents with good quality of life. Marital status of the table can be seen that respondents with glaucoma with married status and quality of life are good, thereby 196 respondents (92.9%), while the status of widows/ widowers, there are 78.3% (18) of respondents who have a quality of life for good and for status 62.5% which are unmarried (10) of respondents with a high quality of life. Education respondents with a good quality of life most frequent are the respondents with primary education that is 72 respondents (92.3%). According to the characteristics of the respondents (employment status) respondents with a good quality of life are more frequent [148 (91.9%)]. However, respondents who work and have a good quality of life (100%), i.e., respondents with private employment/ state (14), TNI/Polri (2), and the Labor / PRT/Farmer (9) people (Table 2).

Table 1: Quality of life in glaucoma patients Community Eye Health Centers Makassar

Quality of life	Frequency (n = 250)	%
Well	224	89.6
Bad	26	10.4

The results of the analysis of the characteristics of respondents relationship glaucoma patients with glaucoma patient quality of life (Table 3), there is no significant relationship between gender and quality of life of patients with glaucoma with $p = 0.237 > \alpha$ (0.05). Similar results were seen in the age group with $p = 0.668 > \alpha$ (0.05) which means that it is not related

Table 2: Distribution of respondents by characteristics in Community Eye Health Centers

Characteristics	Quality of life (n = 250)				Total	
	Bad		Well			
	n	%	n	%	n	%
Gender						
Woman	18	12.3	128	87.7	146	100
Male	8	7.7	96	92.3	104	100
Amount	26	10.4	224	89.6	250	100
Age						
>57 years	16	11.1	128	88.9	144	100
≤57 years	10	9.4	96	90.6	106	100
Amount	26	10.4	224	89.6	250	100
Marital status						
Single	6	37.5	10	62.5	16	100
Married	15	7.1	196	92.9	211	100
Widow widower	5	21.7	18	78.3	23	100
Amount	26	10.4	224	89.6	250	100
Education						
Not school	1	33.3	2	66.7	3	100
Elementary	6	7.7	72	92.3	78	100
Junior high school	0	0	19	100	19	100
High school	13	12.2	88	87.1	101	100
College	6	12.2	43	87.8	49	100
Amount	26	10.4	224	89.6	250	100
Job status						
Yes	13	14.6	76	85.4	89	100
Civil servant	9	26.5	25	73.5	34	100
Private/state	0	0	14	100	14	100
Military/police	0	0	2	100	2	100
Entrepreneur	4	13.3	26	86.7	30	100
Labor/PRT/farmers	0	0	9	100	9	100
No	13	8.1	148	91.9	161	100
Amount	26	10.4	224	89.6	250	100

to age with quality of life of patients with glaucoma. Employment status variables are with p = 0.105> α (0.05) so it can be stated that there is no correlation between age, gender, and employment status with the quality of life of patients with glaucoma in BKMM Makassar.

Table 3: Respondent characteristics variable distribution relationship with glaucoma patient quality of life in Community Eye Health Center Makassar

Characteristics	Quality of life (n = 250)				Total		p-value
	Bad		Well				
	n	%	n	%	n	%	
Gender							
Woman	18	12.3	128	87.7	146	100	0.237
Male	8	7.7	96	92.3	104	100	
Amount	26	10.4	224	89.6	250	100	
Age group							
>57 years	16	11.1	128	88.9	144	100	0.668
≤57 years	10	9.4	96	90.6	106	100	
Amount	26	10.4	224	89.6	250	100	
Job status							
Yes	13	14.6	76	85.4	89	100	0.105
No	13	8.1	148	91.9	161	100	
Amount	26	10.4	224	89.6	250	100	

Table 4 shows factors most related to the quality of life of patients with glaucoma with p = 0.046 is variable and meaningful employment status as a protective factor for the poor quality of life, with the value of Wald on quality of life that is 3.972, which means that 3.972 times long illness related to the quality of life of patients with glaucoma.

Discussion

This study of 250 respondents found that more respondents have a good quality of life. The results of the Chi-square analysis of this study showed that there was no relationship between gender and quality of life. The results also showed that among the patients with glaucoma more men have a good quality of life [92.3% (96)] compared to women [87.7% (128)].

The findings are in line with Charafeddine *et al*. [6] that the sexes are not related to the quality of life with p = 0.114. With cross-sectional study stated that male smokers have a better quality of life than women. In contrast to these results, the results of research [7] suggest that there is a relationship between gender and quality of life (p = 0.001). Although the results of these studies stated that there is a relationship between gender and quality of life, this study says that men have a better quality of life than women. The same result was shown by Hamzah *et al*. [8] that there is a relationship between gender and quality of life with p = 0.001.

Table 4: Multivariate analysis of glaucoma patient quality of life in Community Eye Health Center Makassar

	Research variable	B	Wald	Sig.	Exp (B)	CI 95%	
						LL	UL
Step 1	JK (1)	0.381	2.486	0.115	2.066	0.893	5.091
	Age (1)	0.351	0.653	0.419	0.704	0.300	1.650
	Working (1)	0.865	3.972	0.046	0.421	0.180	0.986
	Constant	2.456	0.84	0.000	11.654		

He also explained that women have estrogen when menopause will be reduced, thus increasing the risk of anxiety and depression that will drop mental health and quality of life.

The study also revealed that the differences that occur can occur due to the coping strategies of men and women differently. Men tend to focus on problems that occur while women focus more on emotion when faced with a problem that women are more likely to have negative emotions that in the long-term can lead to stress and decreased quality of life.

The results also showed that patients with glaucoma with good quality of life more in the age group >57 years are 90.5% (209) and which have a poor quality of life more in the age group ≤57 years. It can be associated with more than half of the respondents that are already aged >57 years. In line with these results, Yuliati and Ririanty [9] got the result p = 0.266 so that it can be seen that there is no relationship between age and quality of life. This study describes the elderly above 50 years, which is usually accompanied by a family, so there are people who accompanied. Old age is also mentioned that it is ready and accepts the illness that tends patient.

In contrast to the results of this study, the research by cross-sectional method revealed that there was a relationship between age and increasing the quality of life for the person's age that will decrease the quality of life. Glaucoma is a disease that is associated with age. Getting older, it will increase the risk of developing glaucoma. The risk of getting glaucoma will increase at age 40–64 years at 1% and the age of 65 years at 5%.

Analysis of employment status variable shows the results of p = 0105, which means that there is no relationship between employment status and quality of life. The results of the Moons *et al*. [10] in contrast to these results say that there is a difference in the quality of life between the population's status as a student, the working population, people who are not working (or looking for work), and residents who are unable to work (or have a certain disability). Research by Wahl *et al*. [11] found that employment status related to the quality of life for both men and women.

Results of Cheung *et al*. [12] found that employment status has a relationship with quality of life (p = 0.047) of patients sclerosing cholangitis. These results are consistent with research [13] that work affects the quality of life p = 0.041 patients undergoing hemodialysis.

Status of respondents works closely with income obtained respondents. It relates to the daily fulfillment of the respondents also associated with the treatment performed. Ongoing treatment was followed by the cost of transportation used and the time taken to perform the treatment. In addition, the treatment effect of treatment carried out will have an impact on

the productivity of the patient. Such activities can work both fixed and activities performed daily [14], [15], [16].

Recommendation

The need for socialization importance of eye examinations for high-risk groups as parents not end in blindness. The dissemination not only on high-risk groups to the family to know the early symptoms of glaucoma.

Conclusion

No relation to gender, age, and income with the quality of life of patients with glaucoma in Makassar Community Eye Health Centers in 2018.

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Effectiveness of Audiovisual Media Intervention Aku Bangga Aku Tahu on Knowledge in Practices in Prevention of Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome Transmission in Adolescents

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Abstract

BACKGROUND: Educational media is a very important component as a means of interaction, one of which is audiovisual media. Health education through audiovisual media, I am proud I know (ABAT) is expected to be able to increase knowledge comprehensively about human immunodeficiency virus (HIV) and acquired immune deficiency syndrome (AIDS).

AIM: This study aimed to determine the effect of ABAT audiovisual media on HIV and AIDS knowledge of school adolescents in Makassar City.

METOHDS: The research design uses quasi experimental approach with the design of the nonequivalent control group design. Sampling using a random sampling technique, as many as 96 adolescents.

RESULTS: The results showed that the majority of respondents were in the age group of 17 years (49%), female sex (52%), and grade 12 level (51%). Based on the results of the Mann–Whitney U Test, there were differences in knowledge before and after the intervention of ABAT audiovisual media playback with a frequency of playback three times and once in the intervention group and the control group (p = 0.001).

CONCLUSION: There are significant differences in adolescent knowledge about HIV and AIDS before and after the intervention. ABAT audiovisual media with playback frequency 3 times are more effective than once. Some comparison of counseling media is needed in order to better know the effectiveness of a media. Based on the research that has been done, it can be concluded that the effectiveness of ABAT audiovisual media on the knowledge of school adolescents can significantly improve HIV and AIDS before and after the intervention is given three times and one in Makassar City.

Introduction

Human immunodeficiency virus (HIV) is a type of virus that attacks white blood cells so it causes the human immune system to decline. Acquired immune deficiency syndrome (AIDS) is a collection of symptoms that arise due to a decrease in a person's immune system due to being infected by HIV [1]. In mid-2017, around 20.9 million people received ART. However, antiretroviral therapy only reached 53% of people living with HIV at the end of 2016, and accelerated responses are needed to increase the scope of treatment, along with other interventions throughout the service chain, including prevention, diagnosis, and chronic care [2].

The situation of HIV cases in Makassar City according to age group in 2018, the number of HIV in the age group (<4–14 years) is 9 cases, (15–19 years) as many as 17 cases, (20–24 years) as many as 104 cases, (25–49 years) as many as 503 cases, and (>50 years) as many as 25 cases of HIV infection. Makassar City is a district/city in South Sulawesi that has a high prevalence of HIV and AIDS. The approach to HIV and AIDS prevention programs that have not yet been fully accepted by community groups is a challenge in preventing HIV and AIDS prevention in the city of Makassar. Based on the results of key population mapping conducted by KPAP South Sulawesi in 2017 shows that the key population that is increasing every year is MSM (men who have sex with men) and it is estimated that the number of MSM in Makassar will continue to increase until 2025 [3].

Rates of HIV diagnosis associated with male sex have increased (1.37 times) in men born in Southeast Asia, (2.18 times) in men born in Northeast Asia, and (1.37 times) for men from America [4]. The higher the percentage of sexually active teens, the higher the risk they face, including from sexually transmitted diseases and pregnancy. Therefore, protective measures need to be taken to prevent it [5].

The WHO has launched the SDGs program, with one of them being combat HIV and AIDS. One

indicator used is the prevalence of population aged 15–24 years [6]. Some ways can be done to combat cases of HIV and AIDS, and sexually transmitted diseases in groups of adolescents are through health education with a variety of methods and media that are targeted to the target [7]. One government program that aims to increase good knowledge about HIV and AIDS in the 15–24 years age group is through the I'm Proud I Know (ABAT) program which is a campaign to prevent the spread of HIV and AIDS so that youth groups can protect themselves and not be infected.

Besides that, to support the achievement of good information, effective and efficient teaching media are also needed; one of them is audiovisual media. Salawati *et al*. [8] states that audiovisual media with a ± 12 min VCD can help students absorb information on HIV and AIDS, and the results of studies conducted Handayani *et al*. [9] state that the results of group discussions guided by a facilitator is an effective method in increasing adolescent knowledge about reproductive health and HIV and AIDS.

Knowledge and behavior become one of the entrances to HIV and AIDS. According to Imron in Afritayeni *et al*. [10] adolescents who lack knowledge in reproductive health become complex problems along with the transition experienced by adolescents. Therefore, this study aims to determine the effectiveness of ABAT audiovisual media interventions on knowledge in the practice of preventing HIV and AIDS transmission in adolescents in the city of Makassar.

Materials and Methods

This research was conducted in four schools, namely, SMAN 3, SMAN 12, Bajiminasa SMAS, and YP PGRI 2 SMART Makassar City. This type of research is a quantitative study using quasi experimental design with the nonequivalent control group design. Three measurements were made, once before the intervention and twice after the intervention.

The population in this study was all students of grade 11 and 12 in SMAN 12, SMAN 3, Bajiminasa, and YP PGRI 2 Makassar City and was willing to participate in the study by signing informed consent. The sampling technique used is simple random sampling. Samples totaled 96 people.

Data collection was carried out three times using a questionnaire. Starting with the first pre-test, then ABAT audiovisual media intervention was carried out. After the intervention, the first post-test is given at a distance of 2 weeks after the intervention. Two weeks later, a second post-test was given. The ABAT audiovisual media intervention consisted of three sessions over 1 week for the intervention group. The control group was given one session a week. Each meeting session discussed about reproductive health, drugs, lifestyle, HIV, and AIDS provided by the facilitator for 120 min each session and in the research process.

Data were analyzed using SPSS using paired t-test if the data were normally distributed and Wilcoxon test if the data were not normally distributed.

Results

The results of the study describe the characteristics of respondents consisting of age, gender, grade level, and majors. In Table 1, the characteristics of respondents by age in the intervention and control groups were at most age 17 years at 49% (47 people). Most were female (52%) with grade 12 (51%) and from the science major (86.4%). Table 2 shows that in the intervention group before being given the audiovisual media intervention ABAT (pre-test) was in the moderate category of 68.7% (33 people) and at least in the less category that was 14.5% (7 people). After being given the audiovisual media intervention ABAT and carried out post 1, there was an increase to a good category by 87.5% (42 people) and a sufficient category of 12.5% (6 people). In post-test 2, there was a slight increase in the good category by 91.6% (44 people) while the category was sufficient by 8.3% (4 people).

Table 1: Distribution of respondents based on characteristics in the intervention and control group in Makassar City in 2019

Characteristics	School teenagers				Total	
	Intervention		Control			
	n (48)	%	n (48)	%	n (96)	%
Age (year)						
16	22	45.8	24	50	46	48
17	25	52.0	22	45.8	47	49
18	1	2.0	2	4.16	3	3.1
Gender						
Men	25	52.0	21	43.7	46	48
Women	23	47.9	27	56.2	50	52
Class						
11	19	39.5	28	58.3	47	48.9
12	29	60.4	20	41.6	49	51.0
Majors						
IPA	38	79.1	45	93.7	83	86.4
IPS	10	20.8	3	6.2	13	13.5

Table 2: Distribution of respondents knowledge categories before and after ABAT interventions in Makassar City in 2019

Knowledge category	School teenagers			
	Intervention		Control	
	n	%	n	%
Pre-test				
Less (≤9)	7	14.5	0	0
Enough (10–18)	33	68.7	22	12.5
Well (≥19)	8	16.6	26	12.5
Post-test 1				
Less (≤9)	0	0	0	0
Enough (10–18)	6	12.5	8	16.6
Well (≥19)	42	87.5	40	83.3
Post-test 2				
Less (≤9)	0	0	0	0
Enough (10–18)	4	8.3	10	20.8
Well (≥19)	44	91.6	38	79.1

Table 3 shows the increase in respondents' knowledge which is obtained a mean value of 15.75 in

Table 3: Distribution of differences in respondent knowledge before and after ABAT interventions three times in Makassar City in 2019

Test group	Knowledge	Min	Max	Mean ± SD	Nilai p
Pre-post 1	Pre	7	21	15.75 ± 3.906	<0.000
(O1 – O2)	Post 1	14	24	21.50 ± 2.124	
Post 1 post 2	Post 1	14	24	21.50 ± 2.124	0.953
(O_2 – O_3)	Post 2	12	24	21.27 ± 2.615	
Pre post 2	Pre	7	21	15.75 ± 3.906	<0.000
(O_1 – O_3)	Post 2	12	24	21.27 ± 2.615	

the pre-test to 21.50 in the post-test 1. Based on the Wilcoxon test results, the significance value was 0.000 ($p < 0.05$) in the pre-test and post-test 1 then H0 is rejected, which means there is a difference between the respondent's knowledge before and after the ABAT intervention 3 times in the pre-test and post-test.

Table 4 shows that there are differences in the knowledge of pre and post 1 with the Wilcoxon test analysis table obtained $p = 0.005 < 0.05$ in the pre-test and post-test 1 then H0 is rejected, which means there is a difference between the knowledge of respondents before and after ABAT intervention as much as once in the pre-test and post-test 1. Although there is an increase in the value of min-max in post-test 1 and post-test 2 by (10–24) to (12–24), but statistically the results of the test analysis are obtained Wilcoxon value of $p = 0.897 > 0.05$, then H0 is accepted. Since H0 is accepted, it can be concluded that there is no significant difference in the knowledge of respondents at the time of post-test 1 with post-test 2.

Table 4: Distribution of differences in respondent knowledge before and after ABAT interventions, one time in Makassar City in 2019

Test group	Knowledge	Min	Max	Mean ± SD	Nilai p
Pre-Post 1	Pre	11	22	17.90 ± 2.823	<0.005
(O1 – O2)	Post 1	10	24	19.52 ± 3.003	
Post 1 post 2	Post 1	10	24	19.52 ± 3.003	0.897
(O_2 – O_3)	Post 2	12	24	19.54 ± 3.149	
Pre post 2	Pre	11	22	17.90 ± 2.823	<0.003
(O_1 – O_3)	Post 2	12	24	19.54 ± 3.149	

The statistical test results in Table 5 using the Mann–Whitney U test show that there are significant differences in knowledge between the intervention group and the control group in the post-test 1 and post-test 2 obtained ($p < 0.05$) which indicates that there are significant differences on knowledge between the intervention group and the control group. While the Wilcoxon test results of the intervention group at post-test 2 obtained $p = 0.953$ and the control group obtained $p = 0.897$, this indicates that the value of $p > 0.005$ which means there is no significant difference in knowledge at post-test 2, but this is which is the hope of researchers that within 2 weeks of measurement after the post-test 1 adolescent knowledge did not decrease.

Table 5: Differences in respondent knowledge after ABAT intervention 3 times and one time in Makassar City in 2019

Knowledge	School teenagers		
	Post-test 1	Post-test 2	p-value
Intervention			0.953
Min	14	12	
Max	24	24	
Mean	21.50	21.27	
Standard deviation	± 2.124	± 2.615	
Control			0.897
Min	10	12	
Max	24	24	
Mean	19.52	19.54	
Standard deviation	± 3.003	± 3.149	
p-value	0.000	0.001	

Discussion

The results of this study indicate that audiovisual media is more effective on knowledge with a frequency of playback 3 times compared to once as an effort to prevent the transmission of HIV and AIDS in adolescent groups in the city of Makassar.

Statistical test results obtained meaningful results on the knowledge of adolescents in both groups after the intervention. The results of this study are in line with research conducted by Ifroh and Ayubi [11] using audiovisual media can facilitate communicators to deliver health messages and overcome time constraints so that there are differences in the level of knowledge of adolescents after intervention.

The average age of respondents in both groups was 17 years (48.9%) so that it is classified as late adolescents. The majority of sexes in this study were women (52%) more than the male sex (48%), this tendency occurred because the number of female student council administrators was more than men. This study is in line with Rahayu *et al*. [12] which state that the number of female respondents is higher in each class compared to the number of male respondents. Then, the sample chosen is dominated by women.

Based on the results of the study, the majority of respondents had good knowledge about HIV and AIDS after being given the audiovisual media intervention. The factors that influence this knowledge at the time of the field are influenced by the mass media or information, because most respondents have gadgets that can certainly make it easy to access knowledge. Knowledge assessment is needed as a preventive measure to improve, strengthen, and avoid risky deviant behavior in adolescents [13].

This is supported by Manumpil *et al*. [14] that the use of gadgets can increase student knowledge. These results are also in line with Iskandar *et al*. [15] that through television, the internet and print media can increase one's knowledge because through high interest a person can search information independently. The results of the bivariate analysis showed that there were differences in knowledge about HIV and AIDS between the intervention and control groups. This means that audiovisual media interventions have a significant influence on increasing adolescent knowledge about HIV and AIDS. The results of this study are supported Asadi and Berimani [16] which states the achievement of foreign language students in the group of audiovisual

material which is significantly higher than the group of students without audiovisual.

The results of this study indicate that adolescent knowledge in the intervention group is higher than the control group. The occurrence of a large enough average difference is one of them supported by the use of audiovisual media that is as much as 3 times ABAT video playback accompanied by discussion. Audiovisual media is media used to convey learning material not only with the sense of sight but also the sense of hearing. This is consistent with research conducted by Handayani *et al*. [9] that the atmosphere of informal education conducted by group discussions also causes respondents or research subjects to be able to take part in education comfortably so that it is easier to receive material. Furthermore, in the group discussion method, each participant interacts and exchanges information and is assisted with media in the form of a VCD so that participants do not get bored easily [16], [17], [18].

Recommendation

Audiovisual media interventions with a frequency of playback 3 times are more effective than audiovisual media interventions as much as once in adolescent knowledge.

Conclusion

There are significant differences in adolescent knowledge about HIV and AIDS before and after the intervention. ABAT audiovisual media with playback frequency 3 times more effective than once. Some comparison of counseling media is needed in order to better know the effectiveness of a media. Based on the research that has been done, it can be concluded that the effectiveness of ABAT audiovisual media on the knowledge of school adolescents can significantly improve HIV and AIDS before and after the intervention is given three times and one in Makassar City.

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The Effect of Celery Therapy and Abdominal Stretching Exercise on Pain Intensity in Adolescent with Dysmenorrhea at the Soppeng High School

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Abstract

BACKGROUND: Reproductive health is an important issue and needs to get more attention, especially among adolescents because adolescents are the nation's next generation so adolescents should have excellent reproductive health because adolescents will later marry and become parents, so the quality of life of adolescents must improve to better direction.

AIM: This study aimed to determine the effect of celery therapy and abdominal stretching exercise on pain intensity in adolescents with dysmenorrhea in Soppeng District High School.

METHODS: This research uses quasi-experimental. A sample of 30 was selected by consecutive sampling that met the inclusion criteria. Samples taken are non-randomized pre-posttest one-group design with accidental sampling method. Data collection using numeric rating scale measurement tools. Data were not normally distributed by analyzing the Wilcoxon test.

RESULTS: The results showed that the characteristics of respondents for age were 14–15 years as many as 16 (53.3%). Based on grade level, the average respondent in class one also had details of 16 (53.3%). The average pain intensity before and after intervention, where the mean value + SD is 0.67 + 0.479–0.27 + 0.450 with p value (P = 0.001 <0.05) which means that there is a difference in the average pain intensity significant before and after therapeutic interventions were given. Celery therapy and abdominal stretching exercise need to be recommended to be used as therapy to treat primary dysmenorrhea in young women at SMAN 1 Watan Soppeng.

CONCLUSION: Based on the results of research and hypotheses, it can be concluded that there are significant differences after therapy which means that the administration of celery therapy and abdominal stretching exercise 3 times before menstruation is more effective in reducing pain.

Introduction

Reproductive health is an important issue and needs to get more attention, especially among teenagers. Because adolescents are the next generation of the nation, adolescents should have excellent reproductive health because adolescents will later marry and become parents, so the quality of life of adolescents must improve in a better direction. Reproductive health is a mental, social, and physical condition that is not only free from disease or disability but everything that is related to the reproductive system itself both its function and process [1].

Based on data from the World Health Organization (WHO) in 2011, it was found that the incidence of women with dysmenorrhea was 1,769,425 (90%) and in 2012, the incidence of dysmenorrhea in the world averaged more than about 50% of women in each state experiencing pain during menstruation. In the United States, the incidence of dysmenorrhea is around 60% and in Sweden around 72%, whereas in Indonesia, the incidence of dysmenorrhea is 107,673 people (64.25%) consisting of 59,671 people (54.89%) who have primary dysmenorrhea and 9496 people (9.36%) who have secondary dysmenorrhea. Around 54.89% of primary dysmenorrhea occurrences occur in Indonesia while the rest are secondary dysmenorrhea in adolescents, while in East Java, the incidence of dysmenorrhea is 64.25% consisting of 54.89% primary dysmenorrhea and 9.36% secondary dysmenorrhea. Although considered harmless, dysmenorrhea can cause discomfort for women who experience it [2].

According to Daley [3], menstrual pain is pain that feels in the lower abdomen such as gripping or kneading, throbbing headaches, nausea, vomiting, pain in the lower back, diarrhea, and even fainting. Adolescence is marked by the emergence of the characteristics of primary sex and secondary sex which is influenced by the start of the working of the reproductive glands. The characteristics of primary sex

are irritability, anxiety, feeling worried, and menstruation, while the characteristics of secondary sex where the hips grow wider and rounder, breasts enlarge, the skin becomes smoother.

Dysmenorrhea is classified into two parts, namely, (1) primary dysmenorrhea associated with previous ovulation and associated with uterine muscle contractions (myometrium) and prostaglandin secretion and (2) secondary dysmenorrhea caused by pathological problems in the pelvic cavity. There are several ways to eliminate or relieve menstrual pain, both pharmacologically and non-pharmacologically. Non-pharmacological management is safer to use without using drugs so it does not cause side effects [3].

Non-pharmacological methods used to relieve dysmenorrhea include compressing warm baths, massage, distraction, physical exercise or exercise, getting enough sleep, a low salt diet, and increasing the use of natural diuretics such as celery leaves. Exercise can overcome dysmenorrhea because exercise is safer used for physiological processes. This is supported by the results of Daley research [3] which states that to reduce pain during menstruation (primary dysmenorrhea), exercise is very effective.

Celery is one of the herbs that are often used to treat food and also as a medicinal plant. Celery has a slightly spicy taste and a distinctive aroma so that it is widely used as a seasoning in various food products [2]. The distinctive aroma of celery comes from phthalide derivatives. Phthalides are known to have anti-inflammatory, antitumor, and insecticide properties. About 74.6–76.6% of phthalides were found in the leaves, the stem part was 56.8–74.1%, and the root part was 57.7–79.7% [4].

Based on the explanation above, it can be concluded that exercise can overcome dysmenorrhea. Because exercise is safer to use because it uses a physiological process. The one-way exercise/exercises to reduce the intensity of menstrual pain is to do abdominal stretching exercise.

According to Thermacare [5], abdominal stretching exercise is a muscle stretching exercise, especially on the stomach which is done for 10 min. This exercise is specifically designed to increase muscle strength, endurance, and flexibility so that it is expected to reduce menstrual pain and also the use of natural diuretics, such as celery leaves, watermelon can overcome dysmenorrhea. The use of this natural diuretic also has the effect of relaxing the muscles so that stomach cramps during menstruation become limp.

Based on the above background, the researchers are interested to know the effect of celery therapy and abdominal stretching exercise on the intensity of pain in adolescents with dysmenorrhea. In a study combined celery therapy and abdominal stretching exercise, so the purpose of this study was to determine the effect of celery therapy and abdominal stretching exercise on pain intensity in adolescents with dysmenorrhea in Soppeng Senior High School in 2019. The results of this study are expected to overcome menstrual pain in adolescents by doing celery therapy and abdominal stretching exercise.

Materials and Methods

The study was conducted at SMAN 1 Watan Soppeng. This research uses quasi-experimental with the matching only pre-posttest control group design.

The population in this study were all students who experienced menstrual pain (primary dysmenorrhea) who attended SMAN 1 Watan Soppeng. A sample of 30 was selected by consecutive sampling that met inclusion criteria aged 14–17 years and was willing to sign an informed consent that had been issued by the Ethics Committee of the Faculty of Public Health, Hasanuddin University.

Data collection in this study was carried out by the researchers themselves by distributing questionnaires or interviewing respondents during the pre-test and post-test. The measuring instrument used is the numeric rating scale (NRS) measurement tool. NRS is one of the standard measurement tools in assessing the level of dysmenorrhea pain.

Intervensi celery therapy and abdominal stretching exercise performed 3 days before menstruation and then post-test after the 1st day of menstruation. Data are processed using STATA to assess the effect of celery therapy and abdominal stretching exercise using a paired *t*-test.

Results

Based on the results of the study, Table 1 shows that the average age of respondents was 14–15 years by 16 (53.3%). Based on grade level, the average respondent in class one also had details of 16 (53.3%).

Table 1: Characteristics of respondents before therapy in Soppeng district high school in 2019

Characteristics of respondents	Intervention of respondents
Age	
14–15 years	16 (53.3%)
16–17 years old	14 (46.7%)
Class	
One	16 (53.3%)
Two	14 (46.7%)

Respondents were given a pre-test and post-test before and after therapy intervention. Table 2 is the results of pre- and post-test obtained results that the average respondent experienced moderate pain during the pre-test with a score of 0.67 (SD=0.479) then after

the post-test, there was a decrease in the level of pain to mild pain with an average score averaging 0.27 (SD=0.450).

Table 2: Distribution of respondents based on respondents' pain scores before and after therapy (pre-test and post-test) in Soppeng Regency in 2019

Statistical value	Pain score	
	Pre-test	Post-test
Intervention group		
Minimum	0	0
Maximum	1	1
The mean	0.67	0.27
Elementary school	0.479	0.450

Table 3 shows the average value of the intensity of pain before therapy celery and abdominal stretching 3 times before menstruation is 0.67 (SD=0.479) and after therapy to 0.27 (SD=0.450). Wilcoxon test results showed a significant difference between the average pain intensity before and after treatment ($p = 0.001<0.05$). Hence, it can be concluded that the administration of celery therapy and abdominal stretching exercise 3 times before menstruation can significantly reduce the intensity of pain in dysmenorrhea.

Table 3: Differences in average pain before and after therapy (pre-test and post-test) in Soppeng Regency in 2019

Variable	Measurement	Mean	SD	SE	N	p-value
Pain score	Pre-test	0.67	0.479	0.088	30	0.001
	Post-test	0.27	0.450	0.082	30	

Discussion

The results found that celery therapy and abdominal stretching exercise proved effective in reducing the intensity of pain in adolescents with dysmenorrhea. Researchers have not found any related research that reveals the relationship between celery therapy and abdominal stretching exercise on menstrual pain intensity, so researchers try to link celery therapy and abdominal stretching exercise one by one.

According to Asep and Ria [6], one of the non-pharmacological therapies, namely, herbal therapy which is often used for traditional medicine by the community is celery (*Apium graveolens* L.). Celery (*A. graveolens* L.) has antirheumatic, sedative, mild diuretic, and antiseptic effects on the urinary tract. From the results of the previous studies, it was reported that celery plants (*A. graveolens* L.) contain compounds containing terpenoids and flavonoids. The previous studies proved that flavonoids have activities as anti-atherosclerosis, anti-inflammatory, and antihypertensive antioxidants.

Celery is known as a vegetable supplement. However, based on the results of pharmacological analysis, it was found that almost all parts of the plant have medicinal properties. Celery roots are efficacious as a diuretic, menstrual decay, and schematic. One of the compounds contained in celery and can be used as a reliever is apigenin. The ease in getting and applying it in everyday life support celery for use in traditional alternative medicine [6].

Exercise is one of the safer non-pharmacological management to use because it uses physiological processes and one way to relieve dysmenorrhea is to do exercise. The results of the study are supported by Daley opinion [3] which states that exercise is effective in reducing menstrual pain (primary dysmenorrhea). Abdominal stretching exercise that is done during dysmenorrhea to improve the development of body awareness, reduce muscle tension (cramps), reduce muscle pain, and reduce pain during menstruation (dysmenorrhea), increase muscle strength, endurance, and muscle flexibility, can increase fitness, optimize the ability to catch, and improve mental and physical relaxation so that it is expected to reduce menstrual pain (dysmenorrhea) in women.

The research conducted by Shahr-Jerdy *et al*. [7] of 179 young women aged 15–17 years. Research conducted to look at the effectiveness of stretching on primary dysmenorrhea found that after 8 weeks of training, the intensity of pain decreased significantly from 7.65 to 4.88 ($p < 0.05$) in the intervention group.

The researchers concluded that stretching was effective in reducing pain intensity, duration of pain, and the number of pain relief tablets in adolescent girls who experience primary dysmenorrhea. Abdominal stretching exercise stimulates the body to release endorphins produced in the brain and spinal cord. Endorphin levels produced can increase 4–5 times in the blood. The more we do exercise the higher the endorphin levels. This increase in endorphins is associated with decreased pain, blood pressure, breathing, and appetite. Endorphin is a hormone that functions as a natural sedative and causes a sense of comfort. When the body exercises, endorphins come out and are captured by receptors in the hypothalamus and limbic system that function to regulate emotions [7].

Jhamb *et a*l. [8] stated that physical exercise has a significant relationship with a decrease in the level of muscle fatigue. Adolescents with dysmenorrhea will experience muscle cramps, especially in the lower abdomen, that are cyclic due to strong and long contractions in the uterine wall resulting in muscle fatigue and physical inactivity so exercise is needed to eliminate these muscle cramps.

This is in line with research conducted by Mahvash *et al*. [9] of 50 students with moderate-to-severe dysmenorrhea. The results of the study found that physical activity for 8 weeks effectively reduced the type and amount of pain medication consumed by respondents, reducing the duration of pain and the intensity of dysmenorrhea pain. Muscle stretching or stretching exercises can also avoid pain that occurs in the neck, shoulders, and back and improve posture. The

purpose of muscle stretching exercises is to help increase oxygenation or the process of oxygen and carbohydrate exchange in cells and stimulate drainage flow of the lymph system, so as to increase muscle flexibility by restoring muscles to their natural length and can maintain their function properly and improve elasticity or flexibility of body tissue and reduce muscle cramps [10-12].

However, the results of this study are not supported by the results of Blakey *et al*. [13] study which states that there is no relationship between dysmenorrhea with exercise/physical exercise. This study also explains that smaller studies (<500 respondents) are more likely to produce positive relationships.

The results of this study researchers can conclude that the reliever package consisting of celery therapy and abdominal stretching exercise is an easy, inexpensive, and physiological intervention. Both of these therapies reduce uterine contractions, reduce cramps in the lower abdomen, and accelerate blood circulation so that ultimately can reduce the intensity of pain in adolescents with dysmenorrhea.

Conclusion

Based on the results of research and hypotheses, it can be concluded that there are significant differences after therapy which means that the administration of celery therapy and abdominal stretching exercise 3 times before menstruation is more effective in reducing pain.

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Risk Factors Analysis and Mapping of Pulmonary Tuberculosis in Community Health Centre Tamalatea of Jeneponto District

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Abstract

BACKGROUND: Tuberculosis (TB) remains a global health problem, and in Indonesia, although TB control efforts have been carried out since 1995. TB is ranked 9th as the leading cause of death worldwide. The increase in the number of TB cases caused by risk factors triggering include a decrease in the immune system caused by HIV infection, nutritional status, education, sex, occupation, air humidity, house ventilation, temperature, occupancy density lighting, and contact history.

AIM: This study aimed to analyze the relationship of nutritional status, contact history, and smoking to the incidence of pulmonary TB in Community Health Centre Tamalatea of Jeneponto District.

METOHDS: This type of research is analytic observational with a case–control design with a total sample of 147 samples consisting of 49 cases and 98 controls. Data collection was conducted from August to October 2019. Data analysis used in the study was univariate and bivariate analysis with Chi-square test.

RESULTS: The results showed that nutritional status (OR=5.403 95% CI: 2.547–11.461), contact history (OR=13.971 95% CI: 3.807–51.262), and smoking (OR=2.782 95% CI: 1.370–5.648) are related to the incidence of pulmonary in Community Health Centre Tamalatea of Jeneponto District. TB officers are expected to intensify the home visit program, especially for pulmonary TB sufferers with a considerable distance from the community health center, with transportation constraints and relatively poor economic conditions so that the health status of pulmonary TB sufferers can be monitored properly.

CONCLUSION: TB officers are expected to intensify the home visit program, especially for pulmonary TB sufferers with a considerable distance from the Puskesmas, with transportation constraints and relatively poor economic conditions so that the health status of pulmonary TB sufferers can be monitored properly.

Introduction

Tuberculosis (TB) remains a global health problem, and in Indonesia, although TB control efforts have been carried out since 1995. TB is ranked 9th as the leading cause of death worldwide. In 2015, there were an estimated 10.4 million new TB cases and an estimated TB death of 1.4 million deaths. In 2016, there were also 10.4 million new TB cases and the death rate increased to 1.7 million deaths from TB compared to the previous year. Seven countries contributing 64% of TB cases in the world are India, Indonesia, China, the Philippines, Nigeria, Pakistan, and South Africa [1].

Data obtained from the Indonesian Health Profile in 2018 show that South Sulawesi is ranked 6th province with the most TB cases in Indonesia. The number of positive smear pulmonary TB cases in South Sulawesi Province in 2018 was 7958 cases. TB in South Sulawesi Province in 2018 was 75 per 100,000 population and case notification rate TB. The positive smear lung is 267 per 100,000 population [2].

Based on data from the Jeneponto District Health Profile, the number of TB cases in the past 3 years tends to increase. In 2016, there were 440 cases reported, in 2017 452 cases, and in 2018, there were an increase of 551 cases. Tamalatea District is the largest contributor to the number of TB cases in Jeneponto Regency with 49 positive BTA cases [3].

The result of Fitriani's study [4] states that the rate of TB transmission in the family environment is quite high and an average patient can transmit it to people in his house, while the risk of transmission to households with TB sufferers >1 person is 4 times higher than that of the home stairs with one person with TB. According to Narasimhan *et al*. [5], TB risk factors include a decrease in the immune system caused by HIV infection, nutritional status, education, sex, occupation, air humidity, house ventilation, temperature, occupancy density lighting, and contact history.

The results of Supriyono *et al*. [6] study in Pekalongan City stated that the risk of pulmonary TB occurring in people with poor nutritional status was 7.5 times greater than that of people with good nutritional

status (OR=7.5; 95% CI=3.406–16.882; p < 0.001). However, the study of Chen *et al*. [7] in rural China found that a history of contact with TB patients was not a risk factor for TB transmission. Nurjana's research results [8] concluded that the risk factor for pulmonary TB in the productive age is the level of education because the level of education will affect one's knowledge about pulmonary TB.

Geographic information systems (GISs) are good tools for improving understanding of data through visualization and analysis. GIS is used by public health professionals to make planning, monitoring, and surveillance. Displaying data in the form of maps are able to provide more insight than table forms with the same data. The map is able to display a rapid assessment of trends and relationships [9]. The general objective of this study was to assess the risk of nutritional status, history of contact, and smoking to the incidence of pulmonary TB and the mapping of the distribution of pulmonary TB cases in the work area of the Tamalatea Health Center in Jeneponto Regency.

Materials and Methods

This research was conducted in Community Health Centre Tamalatea of Jeneponto District, South Sulawesi Province. This research was an observational analytic study using a case–control study design, which is a study by comparing cases and control groups based on their exposure status through retrospective observations by studying the dynamics of the relationship of risk factors with pulmonary TB events who visited the Community Health Centre Tamalatea of Jeneponto District.

Respondents in this study were all patients aged ≥15 years, who suffered or did not suffer from pulmonary TB (+) and were recorded in the TB register and outpatient at the Tamalatea Health Center in Jeneponto Regency. The total sample in this study was 147 respondents consisting of 49 case respondents and 98 control respondents. Case respondents in this study were patients aged ≥15 years who suffered from BTA lung TB (+) and were recorded in the TB register and control respondents were patients ≥15 years who did not suffer from BTA Lung TB (+) and were recorded in the outpatient register.

Data collection is done by means of observation and interviews. The type of data collected in this study is primary data and secondary data. Primary data collection uses a research instrument in the form of a questionnaire used in interviews with respondents while the secondary data are obtained from the TB register of the health office, the results of hospital laboratory examinations, TB registers, and Puskesmas outpatient registers.

Analysis of the data used is univariate and bivariate analysis. Bivariate analysis uses the Chi-square test to assess the relationship between the independent variable and the dependent variable.

Results

Table 1 shows the characteristics of respondents by age group, the most cases occurred at age 26–33 years (24.5%) and the most control group was at age 26–33 years (22.9%) and at age 34–41 years (22.9%). The education level of respondents in the case and control groups was more in the category of not completing elementary school, respectively, 34.7% and 22.9%. However, the proportion of respondents not attending school was found to be more prevalent in the case group (28.6%) compared to the control group (10.4%). Based on work, in the case and control groups, most of the housewives were 38.8% and 27.1%, respectively.

Table 2 shows that based on nutritional status, the proportion of malnutrition was found to be greater in cases (71.4%) than in controls (31.6%). Variable contact history TB, the proportion of no more contacts found in both cases (69.4%) and controls (96.9%). However, the proportion of contacts was more common in cases (30.5%) compared to controls (3.1%). Based on smoking variables, the group of cases more smoked (55.1%) compared to controls (30.6%).

The bivariate test results between the independent variables and the dependent variable in this study are shown in Table 3. The analysis results for the gizi status variable obtained the value OR=5.403 (95% CI: 2.547–11.461), contact history OR=13.971 (95% CI: 3.807–51.262), and smoking OR=2.782 (95% CI: 1.370–5.648) statistically significant for the incidence of pulmonary in Community Health Centre Tamalatea of Jeneponto.

Table 1: Distribution of general respondents characteristics

Characteristics	Case (n=49)		Control (n=98)	
	n	%	n	%
Age (years)				
18–25	8	16.3	16	16.7
26–33	12	24.5	22	22.9
34–41	10	20.4	22	22.9
42–49	6	12.2	12	12.5
50–57	2	4.1	6	6.3
58–65	8	16.3	14	14.6
66–73	3	6.1	6	6.3
Primary school				
Uneducation	14	28.6	10	10.4
Unfinished primary school	17	34.7	22	22.9
Primary school	3	6.1	21	21.9
Junior high school	7	14.3	15	15.6
Senior high school	6	12.2	20	20.8
Bachelor	2	4.1	10	10.4
Job				
Housewives	19	38.8	26	27.1
Laborer	4	8.2	4	4.2
Farmer	17	34.	17	17.7
Entrepreneur	4	8.2	23	24
Civil servant	1	2	10	10.4
Others	4	8.2	16	16.7

Discussion

The results of the bivariate analysis in this study found that nutritional status, contact history, and smoking risked the incidence of pulmonary TB in the working area of the Tamalatea Health Center in Jeneponto Regency.

Table 2: Distribution of respondents based on research variables

Variables	Case (n=49)		Control (n=98)	
	n	%	n	%
Nutritional status				
Less	35	71.4	31	31.6
Good	14	28.6	67	68,4
Contact history				
There is contact	15	30.6	3	3.1
No contact	34	69.4	95	96.9
Smoking				
Smoking	27	55.1	30	30.6
No smoking	22	44.9	68	69.4

Table 3: Distribution of independent variable risk for incidence of pulmonary TB in Community Health Centre Tamalatea of Jeneponto district

Variables	Case (n=49)		Control (n=98)		CI 95%
	n	%	n	%	
Nutritional status					
Less	35	71.4	31	31.6	2.547–11.461
Good	14	28.6	67	68.4	
Contact history					
There is contact	15	30.6	3	3.1	3.807–51.262
No contact	34	69.4	95	96.9	
Smoking					
Smoking	27	55.1	30	30.6	1.370–5.648
Not smoking	22	44.9	68	69.4	

Based on the nutritional status of respondents, it was found that the proportion of nutrients was less greater in cases (71.4%) than in controls (31.6%). Statistical test results obtained from the nutritional status variable value of OR=5.403 (95% CI: 2.547–11.461) with lower limit and upper limit values (LL-UL) that do not include a value of 1. This means that nutritional status is a risk factor (OR=5,403) which is statistically significant for the incidence of pulmonary TB so it can be concluded that people with nutritional status are less at risk of suffering from pulmonary TB by 5.403 times compared to people with good nutritional status.

The results of this study are in line with research conducted by Oktavia *et al*. [10] which shows that the proportion of underweight respondents' nutritional status (body weight less than body mass index) in the case group was 81.8% while in the control group was 21.2%. The proportion in the case group was almost 4 times that of the control group. Statistical test results obtained an OR value of 16.7 (95% CI 4.95–56.39), meaning that people with poor nutritional status increase the risk of developing lung TB 16.7 times compared to respondents with normal/excessive nutritional status. p = 0.001 concluded that there was a statistically significant relationship between nutritional status and the incidence of pulmonary TB.

The results of the study by Supriyono *et al*. [6] showed that the statistical test results obtained p = 0.230 and OR=7.583 with 95% CI=3,406 <OR <16,882, thus stated that nutritional status is a risk factor for pulmonary TB events or there is a relationship between status nutrition with the incidence of pulmonary TB. This means that someone with nutritional status has a risk of increasing the incidence of pulmonary TB as much as 7.583 times greater than with good nutritional status.

Nutritional status is one of the factors that determine the function of the entire body system including the immune system. If the immune system is strong, then the germs will continue to sleep in the body (dormant) and do not develop into a disease but if the immune system is weak, the TB germs will develop into a disease. Pulmonary TB disease is more dominant in people with low nutritional status because of a weak immune system, making it easier for TB germs to enter and multiply [11].

Based on the contact history of TB respondents, the proportion of no more contacts was found in both cases (69.4%) and controls (96.9%). However, the proportion of contacts was more found in cases (30.5%) compared to controls (3.1%). The statistical test results of TB contact history obtained OR value = 13.971 (95% CI: 3.807-51.262) with LL-UL which do not include a value of 1, this means that a contact history of TB is a risk factor (OR=13.971) which is statistically significant for pulmonary TB events so that it can be concluded that people who have a history of contact with TB sufferers the risk of suffering from pulmonary TB by 13,971 times compared to people with no history of contact with TB sufferers.

Research by Butiop *et al*. [12] shows the results of statistical analysis using the Chi-square test on variable household contact factors with the incidence of pulmonary TB, p < 0.05 means that there is a significant relationship between the history of household contact with the incidence of pulmonary TB. The odds ratio value of 3.848 means that the probability for the occurrence of pulmonary TB in a positive household contact factor is about 3.8 times higher than the negative household contact factor.

Based on the smoking habits of the respondents, more group groups smoked (55.1%) compared to controls (30.6%). Statistical test results obtained by smoking variable OR value=2.782 (95% CI: 1.370 – 5.648) with LL-UL values that do not include a value of 1. This means that smoking is a risk factor (OR=2.782) which is statistically significant for the incidence of pulmonary TB so that it can be concluded that respondents with a history of smoking are at risk of suffering from pulmonary TB by 2.782 times compared to respondents who do not have a history of smoking.

The results of Hita *et al*. [13] show that data analysis using the Spearman rank test obtained p =0.000, meaning that there is a significant relationship between cigarette consumption and the incidence of TB in Kawangu Health Centre, Pandawai District, East Sumba Regency, East Nusa Tenggara Province [14], [15].

Conclusion

TB officers are expected to intensify the home visit program, especially for pulmonary TB sufferers with a considerable distance from the Puskesmas, with transportation constraints and relatively poor economic conditions so that the health status of pulmonary TB sufferers can be monitored properly.

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Correlation Study between Elevation, Population Density, and Dengue Hemorrhagic Fever in Kendari City in 2014–2018

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Abstract

BACKGROUND: The incidence of dengue hemorrhagic fever (DHF) has experienced rapid development throughout the world in recent decades. Indonesia was reported as the 2nd country with the largest DHF cases among 30 endemic countries. Dengue virus can develop properly based on certain regional conditions. The elevation is an important factor that can affect the presence of dengue vector mosquitoes. High population density contributes to dengue transmission by increasing the contact between infected mosquitoes and human hosts.

AIM: This study aimed to determine the correlation between elevation and population density with the incidence of dengue in Kendari City in 2014–2018.

METHODS: This research is an observational analytic study with ecological study design. Data incidence of DHF in 2014–2018, elevation and population density were respectively obtain from the Health Office of Kendari City, Meteorology, Climatology and Geophysics Agency of Kendari City, Statistics Agency of Kendari City. The analysis of the data used in the study is univariate and bivariate analysis. Bivariate analysis using Pearson correlation test was performed.

RESULTS: The results showed that the correlation between elevation and DHF (p = 0.014, r = 0.339) and the correlation between population density and DHF (p = 0.186).

CONCLUSION: It can be concluded that there is significant correlation with positive direction between elevation and the DHF, and there is no significant correlation between population density and DHF incidence in Kendari City in 2014–2018.

Introduction

The incidence of dengue hemorrhagic fever (DHF) has experienced rapid development throughout the world in recent decades. Based on the World Health Organization, an estimated 390 million dengue infections occur each year. Cases in America, Southeast Asia, and the Western Pacific are estimated to have more than 3.2 million infected with dengue in 2015 [1]. Asia Pacific bore 75% of the dengue burden in the world between 2004 and 2010, while Indonesia was reported as the 2nd country with the largest DHF cases among 30 endemic countries [2].

In 2017, the number of DHF cases reported in Indonesia was 68,407 cases with an incidence rate of 26.10/100,000 population and a total of 493 deaths with a case fatality rate of 0.72%. Kendari City is a dengue endemic area, as many as 1093 cases were reported in 2016 with an incidence rate of 372.8/100,000 population and a total of 7 deaths with a case fatality rate of 0.64% [2].

In dengue transmission, population factors are emerging along with other climatic and environmental factors [3]. Dengue virus can develop properly based on certain regional conditions. In a place with an elevation of more than 1150 m above sea level the chance of mosquitoes transmitting the virus is very small and in a place with an elevation of more than 1400 masl mosquitoes do not breed. The effect of height variations influences the ecological conditions required by the disease vector [4]. Several studies stated the reasons of increasing trends of dengue fever cases as population growth, urbanization, formation of slums, and increased population density [5], [6], [7]. This study aims to determine the correlation between elevation and population density with the incidence of dengue fever in Kendari City in 2014–2018.

Materials and Methods

The research was conduct in Kendari City, Southeast Sulawesi. This research is an observational analytic study with an ecological study design or population correlation study. This study aims to determine the correlation between elevation and

population density with the incidence of dengue fever in Kendari City in 2014–2018.

The population in this study was the incidence of DHF in 2014–2018 recorded in the Health Office of Kendari City. Population correlation study aims to see the correlation between certain characteristics with the incidence of disease in the whole population so that the unit of observation in this study is the whole population.

Incidence of DHF in 2014–2018, elevation and population density were, respectively, obtain from the Health Office of Kendari City, Meteorology, Climatology and Geophysics Agency of Kendari City, Statistics Agency of Kendari City.

The analysis of the data used in the study is univariate and bivariate analysis. Bivariate analysis using Pearson correlation test was performed.

Results

Table 1 presents the results of univariate analysis of research variables based on the parameters of centering size and the size of the spread. If the distribution of data is normal, the mean and standard deviations are used as a measure of concentration and distribution. If the data distribution is not normal, then the median and percentile are used as a measure of concentration and distribution.

Table 1: Distribution of DHF occurrence, elevation, and population density in Kendari City in 2014-2018

Variables	Min	Max	Mean	Median	Std. Deviation
DHF events per district	0	148	27.04	8.00	43.588
Elevation (m ASL)	3	45	21.23	18.39	10.263
Population density (hectare/population)	4.41	79.71	2034	16.02	18.51

DHF: Dengue hemorrhagic fever.

Table 1 shows that the average distribution of DHF per district in Kendari City in 2014–2018 was 27 cases with the fewest cases being 0, and the most cases were 148 cases. The average height of places in Kendari City in 2014–2018 is 21.23 m above sea level with a minimum height of 3 m above sea level and a maximum height of 45 m above sea level. The average population density in Kendari City in 2014–2018 was 20.34 ha/person with a minimum density of 4.41 ha/person and a maximum density of 79.71 ha/person.

Table 2 presents the results of a bivariate analysis using a correlation test between the elevation and population density variables with the incidence of dengue in Kendari City in 2014–2018. Correlation test results between elevation with the incidence of dengue fever showed p value 0.014 < 0.05, meaning that there is a significant correlation between the elevation with the incidence of dengue in Kendari City in 2014–2018. The correlation coefficient value of 0.339 indicates the direction of a positive correlation with the strength of a weak correlation. Correlation test results between population density and dengue fever show p value of 0.186 > 0.05, meaning that there is no significant correlation between population density and dengue fever in Kendari City in 2014–2018.

Table 2: Correlation test between elevation and population density with DHF in 2014–2018

Variables	DHF	
	r	Sig. (two-tailed)
Elevation	0.339	0.014
Population density	0.186	0.186

DHF: Dengue hemorrhagic fever.

Discussion

The results showed that elevation had a correlation with the incidence of dengue in Kendari City in 2014–2018, while the population density did not have a correlation with the incidence of dengue in Kendari City in 2014–2018.

The average height of places in Kendari City in 2014–2018 is 21.23 m above sea level. Correlation test between elevation and DHF incidence in Kendari City in 2014–2018 showed a p value of 0.014 < 0.05, so it can be concluded that there is a significant correlation between elevation and DHF incidence in Kendari City in 2014–2018. The correlation coefficient value of 0.339 indicates a positive correlation with the strength of a weak correlation. A positive relationship means that the increase in height is also followed by an increase in the incidence of dengue fever.

A study conducted by Handayani *et al*. [8] showed that the elevation and the incidence of DHF have a moderate relationship with a negative pattern r = −0.659 with a significance (p) 0.038. This means that the lower the elevation, the higher the incidence of dengue hemorrhagic fever.

A study conducted by Kesetyaningsih *et al*. [9] showed that cases of dengue fever in Sleman Regency with a high category (50–80 cases/year) and very high (>80 cases/year) occurred at an elevation of <200 masl, especially at an elevation of 50–125 masl. Cases of dengue still occur at an elevation of 300–425 masl, even in the low category. Pearson correlation analysis showed a negative correlation between elevation and dengue cases even though the correlation strength was weak (p = 0,000; r = −0.127). The higher an area, the lower the incidence of dengue fever.

The elevation is an important factor that can affect the presence of dengue vector mosquitoes. These factors affect the air temperature and humidity of a place that will affect the development of vector mosquitoes and dengue viruses [10]. The occurrence of dengue has also spread from low altitudes to more than

1000 m above sea level [11]. The expansion of dengue is expected to increase under the influence of increases in minimum temperature and population migrations resulting from changes in transportation, globalization, trading, social-economic condition, housing, and viral evolution [12].

A study by Sayono *et al*. [13] in Central Java, Indonesia, reported that Aedes mosquitoes were found to be distributed at all altitudes in the study area up to 1.200 m ASL, indicating the influence of climate change. This is the highest altitude that dengue has yet been identified, and the first time such conditions have been recorded in the area; both indicate changes in dengue vector distribution in Indonesia occurring in response to climate change.

The existence of Aedes mosquitoes at high altitudes up to 1200 m ASL indicates that the physical and biological factors in the area are capable of supporting the mosquito lifecycle. Aedes mosquitoes have not previously been found at altitudes of 1000 m ASL due to the low temperature, which impedes the Aedes lifecycle [14]. People in mountainous localities use large, open cement tanks to store clean water, which have become the most common larval habitat at high altitudes [13].

The average population density in Kendari City in 2014–2018 was 20.34 ha/person with a minimum density of 4.41 ha/person and a maximum density of 79.71 ha/person. Correlation test between population density and DHF incidence in Kendari City in 2014–2018 showed a p value of 0.186 > 0.05; there was no significant correlation between population density and the incidence of dengue fever in Kendari City in 2014–2018.

A study by Sirisena *et al.* (2017) in Sri Lanka showed that the dengue incidence was high in areas where the population density is high, and this was clearly seen in the three major Districts, Colombo, Kandy, and Jaffna where the population density is high. The Colombo District from the Western Province has been experiencing a very high dengue incidence, and the highest number of cases reported from 2009 ± 2014 was from this district. The major reason behind the high number of reported cases in the Colombo District appears to be due to the high population density.

The dengue incidence is very low in the Nuwara Eliya District despite this being one of the highly populated district in the wet zone. High altitude seems to play a pivotal role in limiting the distribution of *Aedes aegypti* in the Nuwara Eliya district, which is situated at 1880 m above the sea level. Badulla District is situated in the next highest elevation of 670 m and has a lower population density than Nuwara Eliya, yet reported high dengue incidence in the past 5 years [15].

In India, *A. aegypti* breeding sites range from the sea level to 1000 m above the sea level. Lower elevations (<500 m) have moderate to heavy mosquito populations, while mountainous areas (>500 m) have low mosquito populations [16].

High population density is thought to contribute to dengue transmission by increasing the contact between infected mosquitoes and human hosts. However, high population density areas in São Paulo had a lower incidence of dengue compared to low population density areas [17]. These high population density areas typically consisted of large residential buildings, while the low population density areas typically consisted of individual houses. In contrast, other studies have reported that areas with a predominance of independent houses had higher levels of *A. aegypti* larval infestation [18].

A study by Handayani *et al*. [8] showed that the population density with the incidence of DHF has a correlation of 0.360 with p = 0.307. Thus, it can be concluded that there is no significant positive relationship between population density with dengue fever (DHF).

Study conduct in Vietnamese reported that infrastructure characteristics (e.g., the lack of water supply), rather than population density, had the greatest effect on the transmission of dengue [5]. One previous study found that around 3000–7000 persons/km^2 in Vietnam was the condition for the highest risk for dengue epidemics, and the risk did not increase with density beyond that [5].

Studied in Mexico by Machado-Machado [19], the relative contribution of climate and socio-ecological factors was investigated by including 11 climatic variables on temperature and precipitation but only four socioecological variables in models, resulting in climatic variables having more influence on dengue transmission than socioecological factors. Relative contributions of climatic and socioecological factors were also analyzed in Singapore, where the relative risk of dengue due to population growth was 6 times higher than the relative risk associated with climate alone [20], [21], [22].

Most of these studies found a significant association between dengue and high population density. However, a single study in Argentina reported that rural areas with a low population density may experience severe epidemics in the absence of a tap water supply [17]. High population density might only facilitate the dengue transmission cycle between human beings and mosquitoes when the number of infected cases is large enough, and the trend will still need to be validated by more data in the future [5].

Recommendation

Environmental factors and climate change provide changes to the lifecycle of mosquitoes and virus evolution. Therefore, observing dengue fever trends is needed considering that this disease can become an epidemic at any time.

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Comparison of Success Management Effect of Therapy Use of Generic Drugs and Branded Drugs in Typhoid Fever Patients in Installation of Inpatients

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Abstract

AIM: This research aim to know the comparison of efficacy of the effect therapy uses generic ciprofloxacin and branded drug tequinol from patient of typhoid fever.

METHODS: The research method has the character of the descriptive observational with the technique intake of sample is consecutive sampling/quota sampling. Subject research was conducted on 67 sample fulfilling criterion of inclusion and exclusion diagnosed by typhoid fever at period January–March 2018.

RESULTS: Thirty-four patients use the generic ciprofloxacin and 33 patients use the brand tequinol. Time of fever degradation for patient using brand tequinol range from 1 to 3 day and for patient using generic ciprofloxacin 3–7 day.

CONCLUSION: After tested to use the Mann–Whitney test, there is difference having a meaning of hospitalization of to lodge briefer and free from fever quicker at brand tequinol than generic ciprofloxacin at patient of typhoid fever in RSUD Haji Makassar ($p < 0.05$).

Introduction

Based on observations made in December 2017 at the Haji District Hospital in South Sulawesi Province, it is one of the public hospitals that offers modern, complete, and quality Islamic health services for children, individuals, families, and employees of all age groups so that the hospital this is often used by the community as a place of treatment, especially for patients suffering from typhoid fever. Haji Regional Hospital of South Sulawesi Province is one of the hospitals that handle the most typhoid fever by ranking first in 2016 in South Sulawesi based on the disease index data in the Haji Regional Hospital of South Sulawesi Province.

From the results of observations of data on the use of drugs for typhoid fever in Haji Hospital South Sulawesi Province, the use of generic drugs during January 2018–March 2018 was 62.25% and branded drugs were 37.77%. Based on observations, the cure for typhoid fever using the ciprofloxacin generic drug with a drug uses rate of 17.65% and tequinol brand of 16.66% of a total of 204 cases. Typhoid fever is a systemic infection caused by Salmonella enterica serovar Typhi (*Salmonella typhi*) [1]. Therapy that can be done to treat diseases caused by bacterial infections such as *S. typhi* is by giving the right antibiotics. Based on antibiotic use data at the Makassar Hajj District General Hospital, the antibiotic that is often prescribed for *S. typhi* bacterial infections that cause typhoid fever is the drug ciprofloxacin [2].

The choice of antibiotic for *S. typhi* infection depends on the severity of the infection. The primary choice of infection pharmacotherapy in *S. typhi* bacteria according to Pharmacotherapy A Pathophysiologic Approach Edition 10 of 2017 is ciprofloxacin, levofloxacin, ceftriaxone, and cefotaxime [3].

Previous research by Kesselheim *et al*., [4] in the journal Clinical Equivalence of Generic and Brand-name Drugs used in Cardiovascular Disease believes that generic drugs and branded drugs have almost the same bioequivalent and equally worthy drug choices. For all patients by Karan *et al*. [5], whereas according to Tange *et al*. [6] that generic drugs and branded drugs have a large difference in the level of impurity (impurity)

of about 3% in the formulation so that it affects the bioavailability of the drug.

Based on observations at Makassar Haji Hospital, doctors often prescribe generic drugs to patients but not a few also prescribe branded drugs. This is because doctors are usually faced with the constraints of generic drug stock vacancies so that doctors eventually turn to trademarked drugs or patent medicines. As a result, the use of branded drugs is increasingly being prescribed by doctors to patients especially if the patient comes for treatment a second time it will be given a similar prescription for the same case before.

Materials and Methods

Data collection

A total of 67 cases of a total of 204 cases that met the inclusion and exclusion criteria diagnosed with typhoid fever in the January 2018–March 2018 period were then sampled to compare the therapeutic results of the use of 34 patients using the generic drug ciprofloxacin and 33 patients using brand tequinol.

Data analysis

Data were then analyzed with the help of descriptive statistical methods using the SPSS application version 24. Patient demographic profiles for each area of therapy were expressed in terms of gender (number and percentage), and age class (number and percentage), type of drug used, outcome of patient treatment outcomes, and duration of therapy seen from the disappearance of fever.

The criteria for patients in this study are as follows:

Inclusion Criteria

The following criteria were included in the study:

a. Adult patients (15–60 years) with a diagnosis of typhoid fever who have been hospitalized during January-2018
b. Patients treated with positive Widal test results
c. Patients receiving ciprofloxacin generic antibiotic treatment
d. Patients receiving antibiotic treatment with brand name tequinol
e. Patients who do not have concomitant diseases
f. Patients who are otherwise allowed to go home/recover by a doctor.

Exclusion criteria

The following criteria were excluded from the study:

a. Typhoid fever patients with concomitant diseases
b. Patient did not complete therapy/forced discharge
c. Patients with incomplete and unclear medical records.

Research parameters

a. Duration of patient's fever decreased days (fever free time)
b. The patient's length of stay.

Results

Based on Table 1 can be seen ciprofloxacin generic frequency data 34 or 50.7% and cumulative percent of 50.7%. Meanwhile, the frequency of brand tequinol is 33 or 49.3%.

Table 1: Distribution of inpatient antibiotic use for typhoid fever in Makassar Haji Hospital

Antibiotic	Frequency	(%)
GC	34	50.7
BT	33	49.3
Total	67	100.0

The length of stay of typhoid fever patients while in Makassar Hajj General Hospital with the longest stay for 8 days with a total of 1 patient (1.5%) and the most frequent length of stay, namely, during 4 days with a total of 26 patients (38.8%) (Table 2).

There were 17 patients who used the tequinol brand who experienced a decrease in fever within 3 days and 11 patients using the generic ciprofloxacin. The day of fever reduction which has the most frequency in patients using Ciprofloxacin is 4 days with a total of 16 patients (Table 3).

Based on the Mann–Whitney statistical test, the value obtained is 85,000 and the significance value is 0.000 or ($p < 0.05$) by Sopiyudin [7], because $p < 0.05$ can be concluded that "there is a significant difference between the generic use of ciprofloxacin and the tequinol brand against length of stay of the patient" (Table 4).

Discussion

Based on the results of the study, the distribution of the number of typhoid fever patients by sex is male (37.3%) and female (62.7%). Typhoid fever can occur in all sexes in both women and men. This is in accordance with the report of the Ministry of Health of the Republic of Indonesia Ministry of Health [8] that typhoid fever is

Table 2: Distribution of length of stay of patients with typhoid fever in Makassar Haji Hospital

Day	Frequency	(%)	Cumulative (%)
2	3	4.5	4.5
3	11	16.4	20.9
4	26	38.8	59.7
5	19	28.4	88.1
6	5	7.5	95.5
7	2	3.0	98.5
8	1	1.5	100.0
Total	67	100.0	

found more in women than men. Symptoms of typhoid fever usually appear 1–3 weeks after exposure and may be mild or severe. Symptoms based on research conducted most commonly experienced by typhoid fever patients are fever/heat as much as 100% or a total of 67 patients. Symptoms in the form of fever are the most prominent symptom. Fever will be followed by other non-typical symptoms such as diarrhea, constipation, anorexia, nausea, and vomiting [9].

Table 3: Disturbances for the length of day of fever reduction in typhoid fever patients based on the type of antibiotic

	Count						
Kind antibiotic	Day of fever reduction (day)'						Total patient
	1	2	3	4	5	7	
GC	0	0	11	16	6	1	34
BT	1	15	17	0	0	0	33
Total patient	1	15	28	16	6	1	67

Patients who were said to have typhoid fever were patients who had Widal values >1/160–>1/640 for agglutinin O and H with single or combined diagnostic criteria by Jawetz *et al*. [10], Widal test is a laboratory examination to detect the presence or absence of antibodies in patients with antigens O (from the body of germs), H antigens (germ flagella), and Vi antigens germ capsules [11]. In this study, the antibiotics used were generic ciprofloxacin and brand tequinol. Both types of antibiotics have the same active ingredient, namely, ciprofloxacin. Ciprofloxacin drug is one of the fluoroquinolone antibiotics. According to Bueno and Stull [12], fluoroquinolone is an antibiotic that has a broad spectrum and has strong activity in inhibiting Gram-positive and Gram-negative bacteria.

Table 4: Statistical results of Mann–Whitney description of length of stay and length of fever reduction in typhoid fever patients at Makassar Haji Hospital in the period January-March 2018

Parameter	LRI	LPD
Mann–Whitney U	85.000	142.500
Wilcoxon W	646.000	703.500
Z	−6.244	−5.529
Asymp. Sig. (2-tailed)	0.000	0.000

The fastest average length of treatment was patients who received therapy with brand tequinol than patients who received the ciprofloxacin generic and after being tested using the Mann–Whitney statistical test obtained a significance value of 0.000 or ($p < 0.05$) because $p < 0.05$, Sopiyudin [7] can be concluded that "there is a significant difference between the generic use of ciprofloxacin and the tequinol brand on the length of stay of patients."

The therapeutic response seen from the heat-free time is one of the parameters of the success of the treatment of typhoid fever; if the body temperature drops it means the treatment is successful, whereas if the temperature remains high there may be other infections, complications, or multidrug resistant *S. typhi*. The antibiotic that gives the fastest fever-free time is the tequinol brand compared to the ciprofloxacin generic. The duration of fever reduction for patients using the tequinol brand ranges from 1 to 3 days and for patients using ciprofloxacin generic ranges 3–7 days. The length of time the patient's fever is reduced which is also influenced by the symptoms the patient has. After being tested using the Mann–Whitney test, there was a significant difference in fever-free time between generic ciprofloxacin and tequinol brand in typhoid fever patients in Makassar Haji Hospital ($p < 0.05$).

The Spearman correlation value between length of stay with the type of antibiotic (generic ciprofloxacin and brand tequinol) was −0.769 and the Spearman correlation value between the duration of fever reduction with the type of antibiotic (generic ciprofloxacin and brand tequinol) was −0.681 indicating that the direction of the negative correlation with the strength of the correlation was strong (0.769; 0.681 > 0.5) [13].

Conclusion

The therapeutic effect of using brand tequinol gives shorter stay than ciprofloxacin. The therapeutic effect of using brand tequinol gives a time to reduce fever faster than generic ciprofloxacin.

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Effect of *Cinnamomum burmannii* Stew on Glucose Fasting Blood Levels in Adult Prediabetes in Makassar

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Abstract

BACKGROUND: Prediabetes is a condition that precedes the onset of diabetes mellitus (DM), DM disagreement, and penalties are needed through the management of prediabetes.

AIM: This study aimed to study the effect of giving cinnamon stems (*Cinnamomum burmannii*) for 14 days on the levels of fasting adult blood sugar (glukosa darah puasa [GDP]) in prediabete adults in Makassar City.

METHODS: This research method uses a quasi-experimental randomized pre-test design with a control group. There are 28 samples from a total of 167 communities in the working area of Pampang and Antara Community Health Center who have diabetes risk factors. Levels of GDP, Anthropometry, knowledge level, and 24-h recall were taken from samples that were divided into two groups of cinnamon stew studio with a dose of 10 g + education for the intervention group and education for the control group. Data were analyzed using the will-coxon test and the Mann–Whitney test.

RESULTS : The results showed that significant changes in GDP after giving cinnamon stew and education in the intervention group (p = 0.032), there was a change in GDP levels but not significant after providing education in the control group (p = 0.197), for the average difference change in GDP in the group intervention (−4.14) is greater than the control group (−2.50) but the magnitude of change in GDP is not significant, whereas there is no significant difference in GDP levels between the intervention group and the control group after the intervention (p = 0.270). Consumption of 10 g of cinnamon stew for 14 days can reduce fasting blood sugar levels.

CONCLUSION: Based on the results of the study, there were significant changes in GDP after giving cinnamon stew and education in the intervention group, there was a change in GDP levels but not significant after providing education in the control group, the average change in the intervention group was greater than the control group but the change in GDP not significant, there was no significant difference in GDP levels between the intervention group and the control group after the intervention.

Introduction

Metabolic syndrome is a set of symptoms caused by a group of interconnected factors that can increase the risk of cardiovascular disease and type 2 diabetes mellitus (DM) [1]. Prediabetes is a condition where blood glucose levels are above normal, but have not yet reached the DM criteria. This condition is indicated by the occurrence of Impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) and/or fasting blood glucose (glukosa darah puasa [GDP]) is disturbed [2].

Indonesia ranks third in the world after China and the US with the most prediabetes, which is 27.7 million [3]. Based on the Basic Health Research report in 2018, there were 26.3% of the Indonesian population experienced impaired fasting glucose (100-125 mg / dL).

To help change the behavior of patients with prediabetes, it can be done by changing lifestyles such as food intake and physical activity and providing education. Health education regarding DM influences community behavior opportunities as indicated by a decrease in blood glucose levels after 3 months of education [5]. In addition to education, reducing blood sugar levels can be done by consuming cinnamon stew decoction.

Besides being safe, plants are cheaper and free of side effects [6]. One of the traditional medicinal plants that are believed to reduce blood glucose and lipid profile levels is *Cinnamomum burmannii* or cinnamon because it has a bioactive component of the polyphenol group which has an activity similar to insulin (mimetic insulin) [7].

Research conducted by Meida and Hellena [8] on the effect of cinnamon stew on fasting blood sugar levels showed results between differences before and after fasting blood sugar levels in patients with type 2 DM after being given interventions in the form of cinnamon stew at a dose of 10 mg. Cinnamon has a bioactive component of the polyphenol group that has activities similar to insulin (mimetic insulin) [9].

This cinnamon bark contains active substances, namely, polyphenols which work by

increasing the insulin receptor protein in cells so that it can increase insulin sensitivity and decrease blood glucose levels to near normal. In addition, there are essential oils obtained only from the bark, namely, trans-cinnamaldehyde, eugenol, and linalool which have a percentage of 82.5% of the total composition [10].

This study aims to determine the effect of cinnamon stew on prediabetes adult fasting blood sugar levels in Makassar City.

Materials and Methods

This research was conducted in two working areas of the health center, Pampang health center, and Antara health center for 14 days of educational intervention and cinnamon stew. This research is a quasi-experimental design with randomized pre-test post-test with control group.

The population in this study is adult prediabetes in the working area of Pampang Health Center and Antara Makassar Health Center. The study sample was prediabetes adults in the Makassar City area who met the inclusion and exclusion criteria totaling 28 people. The sample was divided into two study groups: The intervention group (10 g cinnamon stew and education) and the control group (education without cinnamon stew) with a total sample of 14 people per group. The inclusion criteria of this study were those aged 40–60 years, had a GDP level of 100–125 mg/dl, and were willing to consume cinnamon stew every day for 14 days. While the exclusion criteria of this study are body mass index (BMI) <17 kg/m^2, taking herbal medicines or from doctors who can control blood glucose levels, pregnant/breastfeeding women, and in sickness or in doctor's care.

Primary data obtained directly from interviews, questionnaires and laboratory results in the form of respondent characteristics data, data on fasting blood sugar levels, food intake of respondents, and knowledge level questionnaire. Secondary data were obtained from families and from other reference sources that support the research.

Data processing is performed using a SPSS computer program. A univariate test is performed on each variable to see an overview of its distribution and frequency. While the bivariate test was carried out by comparing the results of fasting blood glucose examination before and after the intervention was given using the Wilcoxon test and the Mann–Whitney test to test intergroup treatment. Furthermore, the data that have been obtained will be presented in the form of tables and graphs accompanied by narration.

Results

Table 1 shows that of the two groups, the majority of respondents were female, namely, 13 people (92.9%) in the intervention group and 12 people (85.7%) for the control group. For the age group can be seen for each intervention and control group most of the respondents in the early elderly group (46–55 years), as many as 11 people (78.6%), for the control group as many as nine people (64.3). For the level of education, it can be seen that the educational characteristics for the intervention group are the highest, namely, four junior high school students and four academic students (28.6%), and the most academic/control group is eight people (35.7%).

Table 1: Characteristics of the prediabetes Society in the work area of the Pampang Health Center, and Antara Health Center Makassar City, 2019

Karakteristik	Kelompok				Total	
	Intervensi		Kontrol			
	n	%	n	%	n	%
Jenis Kelamin						
Laki-laki	1	7.1	2	14.3	3	10.7
Perempuan	13	92.9	12	85.7	25	89.3
Kelompok Umur						
Dewasa Akhir (36-45 tahun)	1	7.1	3	21.4	4	14.3
Lansia Awal (46-55 tahun)	11	78.6	9	64.3	20	71.4
Lansia Akhir (56-65 tahun)	2	14.3	2	14.3	4	14.3
Pendidikan						
SD	3	21.4	3	21.4	6	21.4
SMP	4	28.6	2	14.6	6	21.4
SMA	3	21.4	1	7.1	4	14.3
Academy/College	4	28.5	8	57.1	12	32.2
Pekerjaan						
PNS	2	14.3	4	28.6	6	21.4
Wiraswasta	1	7.1	6	42.9	7	25.0
Buruh	1	7.1	0	3.6	1	3.6
IRT	10	71.4	4	28.6	14	50.0
Status Perkawinan						
Menikah	14	100	12	85.7	26	92.9
Cerai mati	0	0	2	14.3	2	7.1
Riwayat Keluarga DM						
Ada	9	64.3	11	78.6	20	71.4
Tidak Ada	5	35.3	3	21.4	8	28.6
Obes Sentral						
Normal	1	7.1	1	7.1	2	7.1
Tidak normal	13	92.9	13	92.9	26	92.9
Obes (IMT)						
Normal	0	0.0	1	7.1	1	3.6
Overweigh	2	14.3	5	35.7	7	25.0
Obesitas	12	85.7	8	57.1	20	71.4

DM: Diabetes mellitus.

In Table 1, for occupation, the intervention group most of the respondents work as IRTs as many as ten people (71.4%) for the control group the majority of respondents work as entrepreneurs, namely, six people (42.9%). For marital status, most respondents have married status where the intervention group is 14 people (100%) and in the control group is 12 (85.7%). Family history, most respondents have a family history of DM, in the intervention group as many as nine people (64.3%) and 11 people (78.6%) for the control group.

In Table 1, for the characteristics of central obesity in the abdominal circumference of each group of respondents, both the intervention group and the control group were mostly of the central obesity status of 13 people each (92.9%). For BMI, the intervention group was mostly obese, 12 people (85.7%), and right people (57.1%) for the control group.

In Table 2, it can be seen that the Wilcoxon test results show that there is a significant difference between the levels of GDP before and after the intervention is given to the intervention group where p value is 0.032 < 0.05 while for the control group shows no significant difference between the levels of GDP before and after it is given intervention where p value is 0.197 < 0.05.

Table 2: Fasting Blood Glucose Analysis of Prediabetes Society in the work area Pampang's Health Center and Antara Health Center Makassar City, 2019

FBG (mg/dL)	Group		p-value
	Intervention Mean ± SD	Control Mean ± SD	
Pre-intervention	108.50 ± 6.88	110.93 ± 7.79	0.489**
Post-intervention	104.36 ± 8.68	108.43 ± 9.18	0.270**
Nilai p	0.032*	0.197*	
∆ FBG concentration	−4.14 ± 6.20	−2.50 ± 6.67	0.506

*Uji Wilcoxon, **Uji Mann–Whitney.

Table 2 also shows that based on the results of the average Mann–Whitney test for GDP levels in the two groups before the intervention, there is no significant difference where p value is 0.489 > 0.05, indicating that the average GDP level of the respondents before the intervention is homogeneous between groups. The mean GDP levels in the two groups after the intervention also showed no significant difference where p value was 0.270 > 0.05.

Table 2 also shows that based on the results of the average Mann–Whitney test for GDP levels in the two groups before the intervention, there is no significant difference where p value is 0.489 > 0.05, indicating that the average GDP level of the respondents before the intervention is homogeneous between groups.

Table 2 also show the mean GDP levels in the two groups after the intervention also showed no significant difference where p value was 0.270> 0.05. Based on the magnitude of the difference in levels of GDP, before the intervention and after the intervention in the intervention group was −4.14 ± 6.20, in the control group was −2.50 ± 6.67, the same results for the difference in the average levels of GDP before and after the intervention showed no there was a significant difference between the two groups where p value was 0.506> 0.05.

In Table 2, the differences in GDP levels between the two intervention and control groups after the intervention also showed no significant difference where p value was 0.270> 0.05.

Discussion

This study shows the effect of giving cinnamon stew on the GDP of prediabetes patients. There was a significant change in the GDP of the intervention group after the intervention, for the control group there was a decrease in the level of GDP but not significant after the provision of educational intervention, whereas for between groups there was no significant difference in GDP levels between the intervention group and the control group.

Judging by the results for the level of knowledge of the intervention group has increased after being given education, this is because respondents were able to find out about prediabetes, how to arrange food to reduce blood sugar levels and the benefits of cinnamon for reducing blood sugar levels. This study is in line with Tim *et al*. [11] in Lakeland Florida about the Effects of Soluble Cinnamon Extract on Body Composition and Metabolic Syndrome in Pre-Diabetes Men and Women showing the results of a decrease in fasting blood sugar levels.

This study is also in line with the study of Meida and Hellena [8] on the Effect of Cinnamon Stew (*C. burmannii* on Fasting Blood Sugar Levels of Type 2 DM Patients showing results after drinking cinnamon stew for 3 days in a dose of 10 mg showed significant results with p = 0.006 < α [0.05]). Similar study by Arini and Ardiaria [12] with the results that there were significant changes (p < 0.05) in all three test groups, with the most significant changes being in the 10 g group with a correlation level of 0.000 and the group 8 g with a correlation of 0.001.

Cinnamon is a plant that has flavonoid content [13] The workings of flavonoid compounds have been shown to have beneficial effects in fighting diabetes, both through the ability to control blood sugar levels and optimize the work of the pancreatic organs by increasing the sensitivity of pancreatic beta cells to produce the insulin hormone needed to regulate blood glucose levels in the body [14].

In addition, the main polyphenol components in cinnamon include cinnamic acid and ferulic acid, both of which have m-hydroxy and p-methoxy residues in the phenol ring structure having significant activity on pancreatic function at a concentration of 1 μM [15]. Increased glucose uptake and slows hepatic gluconeogenesis with no effect from pancreatic insulin output [16]. Asan cinnamat has the same effect as cinnamaldehyde, which can be insulin secretion, increase glucokinase activity and glycogen levels, thereby suppressing the occurrence of gluconeogenesis and glycogenolysis that occurs in the liver [17].

Table 2 also shows the results for the control group given education shows that the mean change in fasting blood sugar levels decreased from 110.93 to 108.43 but statistically not significant (p = 0.197)> 0.05 which means there is no difference between before and after providing education. This is because the control group did not consume cinnamon stew to help reduce blood sugar levels.

These results are in line with the results of the study of Norris *et al*. [18] who said that education is important in the treatment of DM patients where

the provision of education can control blood gamma hydroxybutyrate (GHb) in respondents (0.76%), whereas without the provision of controlled GHb education only (0.26%). This knowledge can be enhanced by forming confidence in oneself so that someone can behave in accordance with daily life [19], [20].

For changes in GDP between the intervention group and the control group, then seen from the large difference in changes between the intervention groups and the control group is statistically insignificant where the value (p = 0.506) which means there is no difference in change between the intervention group and the control group but in each group decreased but a greater change occurred in the intervention group where the value of the difference was 4.14 compared to the control which was 2.50.

For between groups the mean difference in GDP levels in the two groups after the cinnamon stew intervention and education, there was no significant difference where p = 0.270> 0.05 indicating there was no change in fasting blood sugar levels between the intervention group and the control group after the intervention. This is because the time of intervention of cinnamon stew in the intervention group is still lacking so the difference is still less visible.

Recommendation

The level of involvement is one of the impacts in the implementation of a healthy city consisting of two indicators. An evaluation of the two indicators gave satisfactory results. The involvement of stakeholders in this matter is that women have been quite active and participatory. Besides that, the political commitment of the Makassar city government itself has succeeded in bringing satisfactory results to the development of the city. However, it is recommended for each Regional work units at the city government level to further improve coordination with each other, because there are still overlapping tasks between each SKPD.

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The Implementation of Balanced Nutrition Using "Piring Makanku" on Food Consumption of Orphanage Children in Makassar City

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Abstract

BACKGROUND: Compliance with food-based dietary guidelines has been known delivered positive effect on nutrition and public health.

AIM: This study aimed to assess the implementation of balanced nutrition using piring makanku on food consumption of orphanage children.

METHODS: This study design was quasi-experimental with a non-random pretest-posttest with a control group. A total of 30 samples in each group were selected purposively, the treatment group was given nutrition education and piring makanku while the control group was given nutrition education only. Data collected include subject characteristics, nutritional status, and the use of piring makanku (compliance, practice, and portion acceptability). Statistical analysis used t-test for paired and non-paired groups.

RESULTS: The results showed that there were significant differences in both groups after the intervention. Statistically significant results on food consumption in the treatment group included energy (p = 0.002), protein (p = 0.000), and carbohydrate (p = 0.024), whereas in the control group statistically significant on protein (p = 0.002) and fat (p = 0.005). Moreover, there were no significant differences between study groups after the intervention, while there was a significant difference in mean scores of protein and fat intake between groups after the intervention.

CONCLUSION: It was concluded that the two forms of intervention in this study had almost the same effect on the subject's consumption, except for protein and fat intake. As a vulnerable group, children of orphanages need to pay attention to their nutritional and health conditions. In addition, campaign of isi piringku using piring makanku needs to be made in the form of lunch boxes to school.

Introduction

Each country has food-based dietary guideline (FBDG), such as the Food Guide Pyramid in the US, The Thai Nutrition Flag in Thailand, and in Indonesia known as Balanced Nutrition Guidelines (PGS). This guideline is based on the characteristics of the population including habits, socioculture, and science and technology development.

The evidence supporting the guidelines has a broad base but focuses on the relation between food consumption and disease prevention. From this evidence base, diet models can be constructed and translated into food guidance tools, including diagrammatic representations, such as plates or pyramids [1].

The main purpose of eating guidelines is to improve public health and prevent nutritional problems. This objective is evident from several international literatures that adherence to national eating guidelines has an impact on nutritional and health conditions. Hansen *et al*. [2] research concluded that adherence to national FBDG in Denmark was associated with a lower risk of myocardial infarction.

In South Sulawesi, data of Riskedas 2013 showed the prevalence of underweight based on body mass index for age (BMI/U) in school-aged children (5–12 years) higher than the national rate, then the prevalence of wasting and severe wasting (BMI/U) school-aged children (13–15 years) is higher than the national average [3].

The data of Riskesdass showed that the balanced nutrition guideline has not work optimally. Attention needs to be addressed seriously in the school age because children and adolescents are in a period of rapid growth. In the period of rapid growth, nutritional intake can inhibit the function of the growth process.

One of the main targets of PGS is social institutions such as orphanages. School-aged children living in orphanages are particularly vulnerable to problems of nutrition and health as well as being neglected in society. Research of Mwaniki *et al*. [4] in Kenya showed that significantly more orphanage children experienced stunting, wasting, and a higher level of morbidity (p < 0.005).

To spread balanced nutrition guidelines, campaign of isi piringku was held by the Ministry of Health in 2018. In these activities, participants brought breakfast supplies using a container in accordance with piring makanku dishware.

The use of plate media can be used as new strategy in controlling the amount of food consumed and the impact on food intake in the body. McClain *et al*. [5] study concluded that small changes in plate design have the potential to produce relatively greater effects on the amount of food perceive and thus will have an impact on intake in body.

Piring makanku, or a one-off meal, intended as a guide that shows the food at each meal (e.g., breakfast, lunch, and dinner). Visual of piring makanku suggests that eating the portion of vegetables should be more than the portion of fruit and the portion of staple food more than protein dish [6].

To prevent the emergence of nutritional problems, balanced nutrition guidelines need to be socialized as eating guidelines based on the four pillars of balanced nutrition. This current study aims to assess the implementation of balanced nutrition guidelines using piring makanku on food consumption of orphanage children in Makassar city.

Materials and Methods

This research was conducted 16 days in two orphanages in the Makassar city, those orphanages were panti asuhan mulia and panti asuhan resky ananda. This research uses quantitative methods with quasi-experimental design and uses a non-randomized pretest-posttest with the control group design.

Population in this study are all of children living in panti asuhan mulia and panti asuhan resky ananda. A total of 60 samples were selected purposively with the inclusion criteria which were children aged 13–18, approved informed consent, and not suffering chronic nutritional problems. The total sample was divided into two groups, each of the 30 samples in the treatment group received nutrition education and piring makanku, and 30 samples in the control group received nutrition education only. This study was approved by the Ethics Committee of the Faculty of Public Health at the University of Hasanuddin Makassar.

Subject characteristics data were obtained from orphanage records and questionnaires, nutritional status obtained through anthropometric measurement, food consumption were obtained through interviews using 2 × 24 h food recall (weekday and weekend) at the beginning and end of the study.

Data related to piring makanku include preference on piring makanku obtained through a questionnaire, compliance of the use of piring makanku obtained through a control card based on the use at dinner time, the practice of using piring makanku obtained by observation at lunch and dinner for 8 meals times, and portion acceptability received from questionnaire that submitted 15 min after the subjects consumed the food served using piring makanku with the same portion and type of food in the treatment group.

Subject's characteristics, nutritional status, compliance and practice of using piring makanku, and portion acceptability were processed and analyzed using SPSS 24 program for Windows. Food intake data are processed using NutriSurvey software and analyzed using SPSS program. Data of the characteristics, nutritional status, and consumption (intake) of subjects in the two study groups used t-test for paired and non-paired groups.

Results

Characteristics of sample

The age of the subjects ranged from 13 to 18 years. Most subjects were 13–14 years old both in the treatment group (56.7%) and in the control group (40%) (Table 1). In general, the proportion of subjects in both groups was almost the same between junior high school (53.3%) and senior high school (46.7%), but in the treatment group, it was slightly more dominant in subjects with junior high school education (56.7%) (Table 1).

In this study, most of the subjects were low economic families (80%), only few of them were orphans and abandoned. The results of the Mann–Whitney

Table 1: Characteristics of orphanage children

Subject characteristics	Group				Total (n = 60)		p-value
	Treatment (n = 30)		Control (n = 30)				
	n	%	n	%	n	%	
Gender							0.277
Male	8	26.7	12	40.0	20	33.3	
Female	22	73.3	18	60.0	40	66.7	
Age (years)							0.242
13 – 14	17	56.7	12	40.0	29	48.3	
15 – 16	7	23.3	10	33.3	17	28.3	
17 – 18	6	20.0	8	26.7	14	23.3	
Class grade							0.809
VII	7	23.3	10	33.3	17	28.3	
VIII	5	16.7	4	13.3	9	15.0	
IX	5	16.7	1	3.3	6	10.0	
X	1	3.3	3	10.0	4	6.7	
XI	8	26.7	7	23.3	15	25.0	
XII	4	13.3	5	16.7	9	15.0	
Level of education							0.608
Junior high school	17	56.7	15	50.0	32	53.3	
Senior high school	13	43.3	15	50.0	28	46.7	
Orphanage children status							0.006*
Low economic families	28	93.3	20	66.7	48	80	
Loss of father	2	6.7	0	0	2	3.3	
Loss of mother	0	0	2	6.7	2	3.3	
Orphan	0	0	7	23.3	7	11.7	
Abandoned	0	0	1	3.3	1	1.7	

*Significant difference statistically $p < 0.005$.

U-test, there were significant differences in orphanage status of subject (p = 0.006) between the two groups (Table 1).

Nutritional status

Most (75%) of the subjects in both groups was dominated by normal nutritional status (–2 SD to +1 SD) based on BMI/U. The proportion of overweight status (21.7%) was more than underweight subject (3.3%) in both groups (Table 2). Statistical test results showed no significant difference (p > 0.05) on Z-score mean of BMI/U between the two study groups (treatment and control) (Table 2).

Table 2: Nutritional status

Nutritional status	Group				Total		p-value
	Treatment (n = 30)		Control (n = 30)		(n = 60)		
	n	%	n	%	n	%	
Underweight (–3 SD s/d <–2 SD)	2	6.7	0	0	2	3.3	0.456
Normal (–2 SD s/d +1 SD)	22	73.3	23	76.7	45	75.	
Overweight (>1 SD s/d +2 SD)		20.0	7	23.3	13	21.7	

*There was no difference in nutritional status between the two study groups.

Food consumption (nutrient intake)

Table 3 shows the increase mean of energy intake after the intervention in the treatment group (1727.17 ± 271.12 kcal) and the control group (1615.34 ± 168.39 kcal). A very significant difference in the treatment group with an average change of 151.59 ± 229.42 kcal is greater than in the control group. Statistical test results showed a significant p value (p < 0.05) in the treatment group before and after the intervention (p = 0.002), which means that there were differences in energy intake before and after the intervention.

Table 3: Change of nutrient intake mean at before and after the intervention

Nutrient intake	Group		p-value
	Treatment (n = 30)	Control (n = 30)	
Energy			
Pre-test			
Mean±SD (kcal)	1575.57 ± 99.39	1570.53 ± 322.72	0.329
Post-test			
Mean ± SD(kcal)	1727.17 ± 271.12	1615.34 ± 168.39	0.383
p-value	0.002*	0.349	
Δ	151.59 ± 229.42	44.80 ± 261.87	0.098
Protein			
Pre-test			
Mean ± SD (gr)	34.18 ± 3.26	50.08 ± 10.97	0.000*
Post-test			
Mean ± SD (gr)	61.60 ± 9.23	58.33 ± 12.11	0.154
p-value	0.000*	0.005*	
Δ	27.42 ± 9.05	8.25 ± 14.81	0.000*
Fat			
Pre-test			
Mean ± SD (gr)	50.54 ± 5.53	38.62 ± 18.16	0.007*
Post-test			
Mean ± SD (gr)	53.14 ± 5.78	46.21 ± 22.94	0.034*
p-value	0.080	0.043*	
Δ	2.6 ± 7.79	7.59 ± 25.18	0.307
Carbohydrate			
Pre-test[4]			
Mean ± SD (gr)	243.56 ± 16.14	245.26 ± 62.24	0.886
Post-test			
Mean ± SD (gr)	231.07 ± 54.86	229.41 ± 45.38	0.751
p-value	0.024*	0.214	
Δ	–12.48 ± 50.92	–15.85 ± 68.38	0.348
Fiber			
Pre-test			
Mean ± SD (gr)	8.88 ± 0.81	8.04 ± 2.74	0.886
Post-test			
Mean ± SD (gr)	8.74 ± 2.08	7.98 ± 2.34	0.751
p-value	0.650	0.837	
Δ	–0.14 ± 2.05	–0.06 ± 3.36	0.908

*Significant difference statistically p < 0.005; Δ = Mean of change between pre-test and post-test.

The average protein intake in Table 3 showed an increase after intervention in each group, the statistical test showed a significant p-value in the treatment group (p = 0.000). In the control group, the statistical test also showed a significant p value (p = 0.005), it means that there were differences in protein intake after the intervention. For the average change between groups, the results still show that p value is significant (p = 0.000).

Statistical test results of fat intake mean between groups in Table 3 show significant p values (p < 0.05) both before (p = 0.007) and after intervention (p = 0.034). Although the mean value of fat intake in the treatment and control groups was not significant enough the changes (2.6 ± 7.79 gr and 7.59 ± 25.18 gr), the mean values of intake between groups before and after the intervention were quite different.

Carbohydrate intake mean value of subjects in Table 3 decreased by -12.48 ± 50.92 gr in the treatment group and as much as –15.85 ± 68.38 gr in the control group after the intervention. After conducting statistical tests between groups and in each group, there was no significant p value, except in the treatment group (p = 0.024) which means that there were differences in carbohydrate intake before and after the intervention.

Table 3 shows that there was a change in the fiber intake mean in each group after the intervention, where there was an increase intake in the treatment group (0.14 ± 2.05 gr) and a decrease intake in the control group (–0.06 ± 3.36 gr). Statistical test results showed a value of p > 0.005 which means that there was no difference in the fiber intake mean between before and after the intervention both in each group, between groups, and the average change in protein intake (p = 0.908).

The use of piring makanku

Table 4 shows that the mean of subject compliance was categorized as moderate (68.32 ± 3.59), some subjects using piring makanku 9 times

Table 4: Mean of the use of piring makanku scores in the treatment group

Variables	Total	
	n (30)	(%)
Compliance		
Poor (<60)	0	0
Moderate (60 – 80)	13	43,3
High (>80)	17	56,7
Mean ± SD (%)	68.32 ± 3.59	
Practice		
Poor (<60)	13	43.3
Moderate (60 – 80)	7	23.3
High (>80)	10	33.3
Mean ± SD (%)	63.33 ± 31.64	
Portion acceptability		
Good (>80)	21	70.0
Enough (60 – 80)	8	26.7
Less (<60)	1	3.3
Mean±SD (%)	86.25 ± 14.06	

(43.3%) and some using 10 times (56.7%) with the total of 14 days of intervention. There was a difference in the level of compliance due to activities at the orphanage.

Table 4 also shows that most subjects were categorized as poor practice (43.3%) with the mean score of 63.33 ± 31.64 (medium category). The assessment of the practice of using piring makanku based on direct observation by focus on two aspects of the assessment, includes the diversity of food types and portions in accordance with the visual recommendations of piring makanku. In addition, most of the subject portion acceptance is categorized as good (70%), which means that the portion of food given to the subject is in accordance with what they can consume without waste or adding the standard portion of food.

Thus, the use of piring makanku in this study was still not optimal. There are three variables assessed, only the variable of portion acceptance was categorized as good, the rest of the compliance and practice variables were categorized as moderate.

Figure 1 shows that most subjects evaluated piring makanku model to be quite interesting (53.3%). Piring makanku model is designed based on visualization and recommended portion of piring makanku. In terms of color, 76.7% of subjects rated the color quite interesting with the natural color of wood. While in terms of size, more than half of the subjects rated it quite heavy (76.7%), this is in accordance with the raw material used for plate was wood.

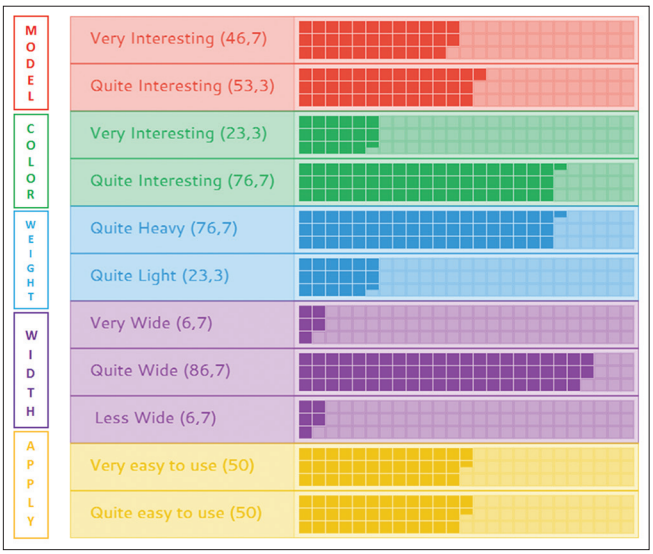

Figure 1: Presentation of preference on piring makanku in the treatment group

Figure 1 also shows most subjects stated that the plate was quite wide (86.7%). In terms of use, all subjects rated it easy to use that is very easy to use (50%) and quite easy to use (50%). Subjects who previously used ordinary plates without the compartment model needed to adapt.

In general, the assessment of the subject's preference for piring makanku needs to be evaluated in terms of the choice of raw materials and colors used to create an attractive impression for the user, in the further development of piring makanku dishware.

Discussion

In this study, the characteristics and nutritional status of the subjects in the two study groups were almost the same and most of the subjects had normal nutritional status. This condition illustrates that the availability of food in an orphanage can be assumed to be sufficient in terms of quantity. For food consumption, most subjects had less energy intake. This condition illustrates that the nutrient intake of subjects is not adequate in terms of quality and quantity.

School-aged children living in social institutions such as orphanages face a high risk of early malnutrition, low intellectual maturity, and loss of closeness to family [7]. This age is a teenager who is very easily influenced in determining lifestyle and eating behavior. However, the problem generally faced by orphanage children is lack of access to information and limited facilities to support child development.

Children in orphanage did not only come from parents who have passed away, but most of them come from families with low economic conditions. Theoretically, neglect is an intentional or unintentional act that leaves the child unmet for his basic needs (clothing, shelter, and food) [8]. As in this study, predominantly, orphans come from poor families. This condition is in line with the case study of child neglect in Surabaya that parents consider sending children to an orphanage due to family economic factors, because the orphanage not only provides shelter and daily food but also provides education guarantees [8].

The distribution of the nutritional status data subjects in this study showed that most of the subjects had normal nutritional status. These results are consistent with the previous studies related to studies of nutritional behavior of orphanages in Malaysia that most respondents were in the range of normal BMI [7].

There was an increase in the average energy intake after the intervention, but most of the subjects were categorized as deficit in the two groups. These results are consistent with the results of the survey total diet 2014 showed that mean of energy intake of teenagers in rural and urban classified as deficit in all provinces in Indonesia when compared with recommended daily allowance (RDA) for energy [9].

When compared with RDA 2019, RDA for energy generally amounted to 2100 kcal/day, mean of energy intake in the treatment group could considered

good, whereas the control group categorized as deficit. Based on the results of statistical tests, it appears that there are differences in energy intake before and after treatment in the intervention group.

For protein intake, when compared with RDA 2019, RDA for protein in general by 57 g/day, therefore, the average intake of protein in both study groups can be categorized as good. Statistical test results showed that there were differences in protein intake mean after intervention in the two groups.

Then for fat intake, when compared with RDA 2019, RDA for fat generally equal to 68 g/day, fat intake mean of subject on both groups categorized as deficit. The results of statistical tests between groups showed that there were differences in the subject's protein intake both before and after the intervention.

Furthermore, for carbohydrate intake, the results of statistical tests did not show a significant value. If based on the RDA 2019, the recommended consumption of carbohydrates for school-aged children (10–18 years) is 280–300 kcal for women and 300–400 kcal for men, so it can be said that the average carbohydrate intake of subjects is categorized as deficit.

For fiber intake, mean intake between the treatment and control groups was almost same before and after the intervention which ranged from 7 to 9 gr. If based on the RDA 2019, the recommended fiber consumption is 28–37 grams in school-aged children, which mean that fat intake mean before and after the intervention is very far from the recommendation intake expected intake (categorized as deficit). According to Akseer *et al*. [10], food choices in conditions of limited resources are limited by high levels of poverty, causing food insecurity, low food diversity, and lack of access to nutritious food.

In general, intake mean of nutrients after an intervention has increased except for carbohydrates. School age is a rapid level of growth for children, but it is very susceptible to disease so nutritional education needs to be provided regarding healthy living behaviors especially those related to balanced nutrition guidelines [11].

By carrying out the PGS socialization program into a community nutrition education program, it can provide many benefits, one of which is in terms of children's nutrient intake [11]. According to Ekundayo *et al*. [12] that orphans or children living in orphanages are faced with survival problems, they continue to look for information but one gap that has not been completely closed in meeting the basic needs of orphanages by various stakeholders is the provision of health information adequately.

This study showed mean of score compliance using piring makanku categorized as moderate. During the 14 days of intervention, about 4–5 days the subject did not use piring makanku because the subject received a donated rice box. Therefore, the good effect of piring makanku on food consumption can be influenced by the level of subject compliance which is not good. The results of this study are similar to the findings of MacKenzie-Smith *et al.* [13] (2018), the study found that patient preference for drug formulations triggers patient adherence, therefore to improve patient adherence must be involved in the selection of treatment formulations.

Meanwhile, the results of observing the practice of using piring makanku showed that most subjects received poor practice scores because they did not follow the suitability of piring makanku portions. The highest number of errors in the subject was the discrepancy in the portion of vegetables taken with the recommended portion of piring makanku.

Research by Disantis *et al*. [14] shows that children serve themselves more with larger plate and bowl sizes and consume nearly 50% of the calories served. This provides new evidence that children's independent portion sizes are influenced by the size of the condition of the eating utensils around their food, which, in turn, can affect children's energy intake.

In general, the subject's awareness of fruit and vegetable consumption is quite good, but in practice, it has not been categorized as good for a vegetable portion because it does not meet the recommended portion of piring makanku. Children generally know the importance of nutrition but they do not care about health benefits of food in food choices.

As recommended by Ministry of Health Republic of Indonesia, therefore, piring makanku in this study has been specifically designed according to the Ministry of Health's recommendations. The goal is to facilitate the subject in measuring various types of food consumed according to portions.

The balanced nutrition guideline introduces piring makanku term to make it easier to determine the type and amount of food consumed at each meal. This is important to note because in the current era of globalization, there is an increase in the amount or portion of food with foods that contain lots of fat. Dimensions pleasure to follow the needs of sensory pleasure seeking, social, and contextual experiences of food consumption [15], [16], [17].

The effect of food portion size is known to correlate with excess calorie consumption and weight gain, exacerbated by the human tendency to spend all food on a plate. According to Benton [18], when the children are offered food that conformed with age, or twice the size of the bite size results or food eaten will increases. Thus, the implementation of PGS needs to be familiarized early to control food portions in children.

Conclusion

Recommendation

There is an effect of combined intervention of nutrition education and piring makanku dishware on the subject's food consumption (energy, protein, and carbohydrate intake), and nutrition education intervention on the subject's food consumption (protein and fat intake). However, there was no significant difference in mean of nutrients intake (energy, carbohydrates, and fiber) between groups after the intervention, while there was a significant difference between changes of protein and fat intake mean between groups after the intervention. Thus, the two forms of intervention in this study have almost the same effect on the subject's food consumption, except protein and fat intake. As a vulnerable group, children of orphanages need to pay attention to their nutritional and health conditions. In addition, campaign of isi piringku using piring makanku needs to be made in the form of lunch boxes to school.

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Association of Gender, Triglyceride/HDL Ratio, and Physical Activity of Obese Adolescents in Makassar

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Abstract

BACKGROUND: Obesity may cause the increase of triglyceride and decrease of high-density lipoprotein (HDL) levels. Triglyceride/HDL ratio is associated with metabolic disorders. Physical activity is one of the important aspects in preventing obesity. Gender is known to have a relationship with these factors, but it has been inconsistent.

AIM: This study aimed to evaluate the relationship between sex and triglycerides, levels of HDL, triglycerides/HDL ratio, and physical activity of obese adolescents in Makassar.

METHODS: This study used a cross-sectional design involving 93 samples of obese adolescents from three high schools. Measurement of triglyceride and HDL levels was performed by the Prodia laboratory, while physical activity was measured using the International Physical Activity Questioner. Data analysis was performed with Chi-square and Fisher's exact tests.

RESULTS: The results showed that there is a relationship between gender and triglyceride levels (p = 0.006) and HDL (p = 0.034), but no relationship between the ratio of TG/HDL (p = 0.109) and physical activity was found (p = 0.339).

CONCLUSION: Efforts should be made to reduce the level of risk adolescent obesity on the risk of metabolic syndrome and cardiovascular disease, including increase physical activity. Physical activity is important to maintain the physical and mental of obese adolescents.

Introduction

Some studies have shown the association of gender with obesity. Male and female may have differences in exposure to the obesogenic environment. The difference is probably due to biological and psychosocial factors. Biological factors, such as sex hormones, cause one sex to have a greater risk of becoming obese. Involvement in physical activity, as one of the factors the risk of obesity, can also make any differences in response to the obesogenic exposures.

However, various studies have been conducted to examine obesity in adolescents showing that men and women have the same possibility to dominate the incidence of obesity in a region. Studies involving teenagers in an international sample found that adolescent obesity rates are higher in males than females. Another study found that the incidence of obesity was higher in women [1], [2], [3]. However, the difference was not significant [4]. A study conducted in Europe in 1990 found a number of countries to have almost the same prevalence of overweight and obesity in men and women, meaning that young men and young women have the same risk of obesity [5].

Obesity causes increased triglyceride levels and decreased high-density lipoprotein (HDL) levels [6]. Triglycerides are glycerides in which glycerol is esterified with three fatty acids. The main function of triglycerides is as an energy reserve. HDL is the smallest and most density lipoprotein. HDL contains the largest proportion of protein for cholesterol. HDL plays an important role in the synthesis of steroid hormones and protection against cardiovascular disorders. Obese adolescents have high triglyceride levels and low HDL [3]. Research on adolescents in Makassar shows that obese adolescents had higher triglyceride levels and lower HDL levels when compared to overweight adolescents. Obese adolescent boys had high triglyceride levels while more obese female adolescents had low HDL levels [7]. Similarly, another study reported that more boys had higher triglyceride levels than girls [8], [9]. As for HDL levels, it was found that male adolescents aged 16–19 years had lower HDL levels when compared to adolescent girls [10]. Another study found that low HDL levels were more common in children, adolescents, and adult males when compared to females [11]. In

adolescent boys, obesity causes a decrease in the number of HDL subspecies [12].

Ratio of triglyceride/HDL is the ratio between the values of measurement of triglycerides to HDL. This ratio reflects the interactions between lipid fractions compared to only looking at triglyceride or HDL levels [13]. This ratio is related to disorders and diseases of metabolism. During the 20-year follow-up found that to group with high triglyceride/HDL ratio is likely to have hypertension when compared with the group that has low ratio triglyceride/HDL ratio [14].

There is a significant relationship between physical activity and obesity. Respondents who did not exercise in a regular basis may have a risk of obesity 1.35 times higher than their counterparts. In addition, respondents who do not exercise regularly tend to have a higher energy intake than those who exercise regularly [15]. It has been widely known that physical activity plays an important role in the prevention of obesity in children and adolescents [16]. Research in Turkey shows that men have higher physical activity scores than women [17]. Women are more sedentary than men [2]. Teenage boys look more moderate to heavy physical activity when compared to teenage girls, but the difference is not significant. Adolescent boys are more involved in physical activity when compared to adolescent girls [18]. However, a study in India found that there was no difference of physical activity by sex, including moderate-to-vigorous activity [19].

In Makassar, the number of obese adolescents has been increased significantly. This phenomenon has the potential to cause medical implications, such as an increased risk of adolescent obesity against cardiometabolic disease. Gender has been shown to play an important role in the risk of cardiometabolic disease through triglycerides, HDL, and physical activity. Therefore, this study will discuss the gender differences in the triglyceride/HDL ratio and physical activity in obese adolescents. This paper is expected to provide information for the development of appropriate interventions based on gender.

Materials and Methods

This study used a cross-sectional study design. This study was conducted at State Senior High School (SMA), namely SMA 12, SMA 13, and SMA 16 in Makassar City. Data collection was performed from September 3, 2019, to October 3, 2019. The population in this study was all adolescents aged 15–18 years in SMA 12, SMA 13, and SMA Negeri 16 Makassar. The target population is obese adolescents based on the screening performed before data collection. A simple random sampling method has been used to select participant of the study. The inclusion criteria were obese adolescent and willing to be measured and interviewed. If the students were absent at the time of data collection, they will be excluded in the study. The samples in this study were 93 students consisting of 54 students from SMA Negeri 12, 16 students from SMA Negeri 13, and 23 students from SMA Negeri 16 Makassar.

At the screening phase, we only measured those who are clinically or suspected to be overweight or obese and are willing to measure their weight and height. The research sample was measured by weight and height directly by researchers using digital weight scales and microtoise. We determine the status of obesity using body mass index for age z score (BAZ). Students' weight was measured using SECA digital weight scales. Students were asked to wear minimal clothes and they were not allowed to wear shoes or other things that might affect weight; the height of the sample is measured using microtoise. The tool is posted on the wall in a flat school area. Respondents were then asked to take off shoes and socks and not wear hats. Respondents were asked to stand up straight with their heels pressed against the wall and straight ahead. The height is then measured and read at the nearest decimal number.

Samples are asked to fill out a questionnaire that measures heavy physical activity (vigorous activity), moderate physical activity (moderate activity), walking activity, and sitting activity on someone in the past week using the International Physical Activity Questioner. Before the blood taken, the procedure has been clearly conveyed to the sample, including fasting for 10–12 h. Then with aseptic manner, 10 mL of the blood sample was for each student by a trained laboratory staff of Prodia. The blood was then stored in a cool box of 8°C and transported to the Prodia laboratory for further examination.

Triglycerides are a type of fat found in the blood. This type is the result of the body's work description of foods containing fat and cholesterol that have been consumed and entered the body, and also formed in the liver. In this study, triglycerides are categorized into two, namely normal and abnormal. Normal if the triglyceride level is <150 mg / dl and abnormal if the triglyceride level is> 150 mg / dl

HDL is the smallest and densest lipoprotein, containing the highest proportion of protein to cholesterol. In this study, HDL was categorized into two, namely normal and low. Normal if HDL levels in men> 40 mg / dl and women> 50 mg / dl. Low if HDL levels in men <40 mg / dl and women <50 mg / dl

The Triglyceride / HDL ratio is the result of a comparison of the laboratory value of triglycerides with high density lipoproteins [20]. In this study, the Triglyceride / HDL ratio was categorized into two, namely low and high. Low if the score of male respondents is <3.5 and the score of female respondents is <2. High if the score of male respondents is> 3.5 and the score

of female respondents is> 2 [21]. Physical activity is any movement of the body that requires energy to do it. In this study it was categorized into 3, namely mild if the respondent's physical activity score was <600 MET minutes / week, moderate if the respondent's physical activity score was> 600 to <3000 MET minutes / week and heavy if the respondent's activity score was> 3000 MET minutes / week.

Data were analyzed using SPSS. We presented the data in the form of univariate and bivariate analysis. To examine the relationship between sex with triglyceride levels, HDL levels, and triglyceride/HDL ratios, Chi-square test was used, while Fisher's exact test for examining the relationship between sex and physical activity.

Results

Table 1 shows that the sample in this study was generally male (61.3%) and aged > 16 years (75.3%). Most fathers sample occupation is civil servants (PNS), which is 43% and the most occupation of mothers is as housewives (IRT), which is 41.9%. Table 2 shows that the mean triglyceride is 124.19 mg/dl, with a standard deviation of + 55.908 mg/dl, the highest value is 283 mg/dl and the lowest value is 56 mg/dl. The mean value for HDL is 44.19 mg/dl, with a standard deviation of + 8.16, the highest value is 70 mg/dL, and the lowest value is 31 mg/dL. The triglyceride/HDL ratio score has a mean value of 2.94 with a standard deviation of + 1.50, the highest value is 7.86, and the lowest value is 1.07. Physical activity has a mean value of 2809.8 MET with a standard deviation + 2031.8, the highest value is 8178 MET, and the lowest value is 405 MET.

Table 1: Characteristic respondents

Characteristics	(n=93)	
	n	%
Sex		
Male	57	61.3
Girl	36	38.7
Age		
<16 years old	23	24.7
≥16 years old	70	75.3
Father's occupation		
Daily labors	2	2.2
Medical doctors (GP)	1	1.1
Teachers	13	14.0
Private employees	2	2.2
Managers	2	2.2
Civil servants	40	43.0
Entrepreneurs	33	35.5
Mother's job		
Midwives	2	2.2
Medical doctors (GP)	1	1.1
Teachers	17	18.3
Housewives	39	41.9
Farmers	2	2.2
Civil servants	22	23.7
Entrepreneurs	10	10.8

Table 2: Levels of TGL, HDL, ratio of triglyceride/HDL, and physical activity sample

Parameter	Mean ± SD	Min	Max
Triglyceride (mg/dL)	124.19 ± 55.908	56	283
HDL (mg/dL)	44.19 ± 8.16	31	70
Triglyceride/HDL ratio (score)	2.94 ± 1.50	1.07	7.86
Physical activity (METs)	2809.8 ± 2031.8	405	8178

TGL: Triglycerides, HDL: High-density lipoprotein.

Table 3 shows that the mean value of triglycerides in obese men (134.30 mg/dl) is higher than in obese women (103.8 mg/dl). Mean HDL values in obese men (42.65 mg/dl) are lower than HDL values in obese women (46.64 mg/dl). The mean triglyceride/HDL ratio in men (3.39) is higher than in women (2.34). The mean value of physical activity in obese men (2825.8 MET) is higher than obese women (2800.3 MET).

Based on Table 4, it can be seen that triglyceride levels in obese adolescent boys (66.7%) and obese adolescent girls (91.7) are still largely normal. Chi-square test value shows the p = 0.006, which means that there is a relationship between sex with triglyceride levels in obese adolescents. In addition, it was also seen that HDL levels in obese male adolescents (56.1%) and obese female adolescents (77.8%) were also largely normal. Chi-square test value shows the value of p = 0.034, which means that there is a relationship between sex with HDL levels. Instead, different results were found in the triglyceride/HDL ratio. The triglyceride/HDL ratio in obese adolescent boys mostly has a low score (61.4%), compared to obese adolescent girls whose scores are mostly high (55.6). Chi-square test value shows the value of p = 0.109, which means that there is no gender relationship with the triglyceride/HDL ratio in obese adolescents. Physical activity in obese adolescent boys and obese adolescent girls is mostly moderate activity, namely 61.4% and 52.8%. Fisher's exact test results showed a value of p = 0.339, which means that there is no gender relationship with physical activity in obese adolescents.

Discussion

This research aimed to examine the relationship between sex and triglyceride levels, HDL, triglyceride/HDL ratio, and physical activity among obese adolescents. Some studies in the literature have shown that there is a relationship between these variables, although the results have not been inconsistent.

This study found that high triglyceride levels were more common in obese adolescent boys (33.3%) than obese adolescent girls (8.3%). Chi-square test results showed p = 0.006, which means that there is a relationship between sex with triglyceride levels in obese adolescents. The mean value of triglycerides is higher in men (134.30 + 53.5 mg/dl), whereas in women (103.8 + 29.9 mg/dl), this can be caused by different eating patterns.

Similarly, levels of HDL are low more common in obese boys (43.9%) than girls (22.2 %). Chi-square

Table 3: TGL, HDL, triglyceride/HDL ratio, and physical activity based on gender samples

Parameter	Boys			Girls		
	Mean ± SD	Min	Max	Mean ± SD	Min	Max
Triglyceride (mg/dL)	134.30 ± 53.5	56	283	103.8 ± 29.9	59	184
HDL (mg/dL)	42.65 ± 7.55	31	63	46.64 ± 8.59	32	70
Triglyceride/HDL ratio (score)	3.39 ± 1.93	1.26	12.25	2.34 ± 0.98	1.07	5.56
Physical activity (METs)	2815.8 ± 1767.5	471	7070	2800.3 ± 2419.3	405	8178

TGL: Triglycerides, HDL: High-density lipoprotein.

test value shows the value of p = 0.034, which means that there is a relationship between sex with HDL levels. According to the result of HDL concentration by sex, this study found that the mean value of HDL in obese boys (42.65 mg/dL) was generally normal (normal range for boys > 4 0 mg/dL). Although the value is lower than the HDL value in obese girls (46.64 mg/dL), which is generally higher but has not reached the normal HDL limit (normal range for girls >50 mg/dL).

HDL levels in women are higher than men. In a study in Korea, it was found that women had a mean HDL value of 46.3 mg/dl, while men had a mean HDL of 43.8 mg/dl [22]. High levels of HDL in women explain why women have a lower risk of dying from cardiovascular disease [23]. The difference in HDL levels can be explained because women have the hormone estrogen. Estrogen is known to reduce fat accumulation activity in women [24]. A study found that HSD11B1SNP, which indirectly affects glucose and HDL metabolism in women, is likely to be under the regulation of the HSD11B1 gene associated with estrogen [25]. However, HDL levels decreased significantly in women who were exposed to passive smoking when compared to women who were not exposed. This was not found in men. Cigarette smoke can increase cardiovascular risk in adolescent girls [26].

Table 4: Relationship of TGL, HDL, triglyceride/HDL ratio, and physical activity based on gender samples

Parameter	Male		Girl		p
	n	%	n	%	
Triglycerides					
Normal	38	66.7	33	91.7	0.006*
High	19	33.3	3	8.3	
HDL					
Normal	32	56.1	28	77.8	0.034*
Low	25	43.9	8	22.2	
Triglyceride/HDL ratio					
Low	35	61.4	16	44.4	0.109*
High	22	38.6	20	55.6	
Physical activity					
Low	3	5.3	5	13.9	0.339**
Moderate	35	61.4	19	52.8	
High	19	33.3	12	33.3	

*Chi-square test; **Fisher's exact test. TGL: Triglycerides, HDL: High-density lipoprotein.

Obesity is closely related to the risk of heart disease. Myocardial metabolic responses in men and women to obesity are not exactly the same. Obesity and gender trigger myocardial blood flow and MVO2 is strongly associated with myocardial substrate metabolism. Gender differences in myocardial metabolism may affect development or adaptation to obesity related to heart disease [27]. Male gender, family history of obesity, and low HDL levels correlate with the incidence of metabolic syndrome [28].

This study shows that the triglyceride/HDL ratio in obese adolescent boys mostly has a low score (61.4%), compared to obese adolescent girls whose scores are mostly high (55.6 %). The mean triglyceride/HDL ratio in men [3], [37] is higher than in women [2], [34]. The reason that the triglyceride/HDL ratio scores in men lower than in women is probably related to the standard used, where men have a standard score of 3.5 and women [2]. Thus, the triglyceride/HDL ratio score does not describe each component of cholesterol, but rather the contraction between the two. In spite of the men have higher triglycerides and lower HDL, most of the triglyceride/HDL ratio scores is actually low. If the triglyceride/HDL ratio scores in boys are mostly low, it does not mean that they are free from the risk of metabolic syndrome. Obese boys and girls are equally at risk of metabolic syndrome.

The triglyceride/HDL ratio is a good marker of atherogenic lipid abnormalities. In addition, this ratio also correlates with the incidence of insulin resistance, increased risk of cardiovascular disease, and metabolic syndrome [29], [30]. According to one study, the triglyceride/HDL ratio can be used to identify adolescents at risk for obesity, dyslipidemia, hypertension, and metabolic syndrome [31]. The other studies have shown that triglyceride/HDL ratio is the best marker for identifying individuals at risk of metabolic syndrome compared to other ratios [32].

This study shows that physical activity in obese adolescent boys and obese adolescent girls is mostly moderate activity, namely 61.4% and 52.8%. Fisher's exact test results showed a value of p=0.339, which means that there is no gender relationship with physical activity in obese adolescents. The mean value of physical activity in obese men (2825.8 MET) is higher than obese women (2800.3 MET).

The results of this study are different from research conducted by Taber, et al., 2016. Taber's research found a relationship between physical activity and gender. Measurement of physical activity includes total physical activity in the past year and the number of days of moderate to heavy physical activity in the past week [33]. Research in Turkey shows that men have higher physical activity scores than women [17]. A study found that women were more likely to be sedentary than men [2]. Teenage boys look more moderate to heavy physical activity when compared to young women, although the difference is not significant. Other studies have found that more boys are involved in physical activity than girls [18].

Physical activity plays an important role in the prevention of obesity in children and adolescents [16]. There is a role for physical activity in adolescent

mental health. Adolescent girls report lower mental health and less physical activity when compared to adolescent boys [34]. It is necessary to encourage obese adolescents to do physical activity so that not only improve their nutritional status but also maintain mental health. Physical activity is very important to maintain the physical and mental health of obese adolescents.

This research contributes to preventing heart and blood vessel disease early on by providing a basis for developing interventions that are gender compatible. The best way to find out who is at high risk is through early prevention screening. This helps reduce risk in adolescents so that interventions can be developed that can reduce these risks [35]. Some researchers suggest that the prevention of heart and blood vessel disease is done by identifying risk factors and behavior early on [36].

Recommendation

Efforts should be made to reduce the risk level of obese adolescents to the risk of metabolic syndrome and cardiovascular disease, including physical activity as physical activity can maintain the physical and mental of obese adolescents.

Conclusion

There was a relationship between gender and triglyceride levels (p = 0.006) and HDL levels (p = 0.034). However, no relationship was found between the Triglyceride / HDL ratio (p = 0.109) and physical activity (p = 0.339) in obese adolescents in Makassar City.

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Analysis of Nutrition Intake Based on Gender in Adolescents

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Abstract

BACKGROUND: Teenage is one of the important phases in life. At this stage adolescents need adequate nutritional intake to support the growth spurt process.

AIM: The study wanted to see how nutrition is based on gender in the city of Makassar.

METHODS: This research was conducted in one senior high school in Makassar city, the capital city of South Sulawesi Province, Indonesia. The study lasted for 3 months, from July to August 2018. The population in this study was students of class XI and class XII in the 2018–2019 academic year, amounting to 594 people. The sample amounted to 114 students using a sampling technique of systematic random sampling. Characteristics of respondents were collected using a standard questionnaire. The intake data were collected through 24-h food recall and processed using nutrisurvey. All information is then processed using SPSS. This was an observational study with a cross-sectional design. Data were analyzed using univariate analysis.

RESULTS: The majority of respondents in this study were girls adolescent (63.2%), age 16 years (52.6%), normal nutritional status (81.6%), education of fathers and mothers graduating from high school or equivalent(42.1% and 43, 0%), education of self-employed fathers (50%), and employment of mothers are housewives (79.8%), and pocket money of Rp. 10,000–20,000 (50.9%). The study found that male adolescents had a mean higher intake of energy, fat, fiber, vitamin A, vitamin B9, Vitamin B12 and Calcium. Whereas female adolescents have a mean higher intake of protein, vitamin B6, vitamin C, Fe and zinc. But the intake is not significantly different. Based on the adequacy of the 80% rate of nutritional needs, it was found that all adolescents did not meet these standards.

CONCLUSION: Nutritional intake in adolescents in Makassar still does not meet the recommended intake standards and does not differ in all sexes. Macronutrient and micronutrient intake in young men and women still does not meet the recommended nutritional adequacy rate.

Introduction

Teenage is one of the important phases in life. At this stage, adolescents need adequate nutritional intake to support the growth spurt process. But unfortunately, the intake in adolescents is still far from the recommended figure. A study shows that intake in adolescents, such as energy, carbohydrates, protein, and fat, largely does not meet the recommended nutritional adequacy rate [1].

As a phase prepared to deal with reproduction, teenagers have different nutritional needs based on sex. Young women need iron and folic acid to deal with preconceptions, while young men need zinc to support sperm quality and quality. Total daily food intake is related to sperm morphology. This relationship is largely driven by fat food intake. Fat intake is also associated with progressive low sperm mortality [2]. Sources of protein, consumption time, quantity, and composition are factors that determine the effect of protein preload on long-term food intake in men [3]. There is an inverse relationship between dairy products with low sperm morphology. This is consistent with the hypothesis that dairy food products contribute to a secular decline in sperm morphology [4]. In boys, the intake of milk and other dairy products is related to prepubertal growth hormone levels, insulin-like growth factor 1 (IGF-1), and IGF1 ratio and IGF-binding protein [5].

In addition, gender turns out to have an influence on food intake, where certain sexes also choose certain foods. Based on the findings of Kiefer, young men consume more energy, fat, and cholesterol, but consume less fiber and carbohydrates than girls. Based on this background, the study wanted to see how nutrition is based on gender in the city of Makassar.

Materials and Methods

This research was conducted in one senior high school in Makassar city, the capital city of South Sulawesi Province, Indonesia. The study lasted for 3 months, from July to August 2018. The population in this study was students of Class XI and Class XII in the

2018-2019 academic year, amounting to 594 people. The sample amounted to 114 students using a sampling technique of systematic random sampling. Data about the characteristics of respondents were collected using a standard questionnaire. The intake data were collected through 24-h food recall and processed using nutrisurvey. All information is then processed using SPSS. This was an observational study with a cross-sectional design. All variables are collected at the same time point. Data were analyzed using univariate analysis.

Results

The study found that male adolescents had a mean higher intake of energy, fat, fiber, Vitamin A, Vitamin B9, Vitamin B12, and calcium, whereas female adolescents have a mean higher intake of protein, Vitamin B6, Vitamin C, Fe, and zinc. However, the intake is not significantly different (Table 1).

Based on the adequacy of the 80% rate of nutritional needs, it was found that all adolescents did not meet these standards (Table 2)

Discussion

To the best of our knowledge, this is the first study to examine gender differences in nutrient intake among adolescents in Indonesia. In this study, it was found that the intake of adolescents in all sexes still did not meet the 80% of the recommended nutritional requirements. This needs to be a concern, considering that adolescents are facing growth spurts and preparing themselves for a preconception period. Inadequate intake will cause adolescents not to grow optimally

This study found that macronutrient and micronutrient intake in adolescent boys and girls still did not meet the recommendations. These results are almost similar to those found by Tanja, who looked at energy, nutrient, and fiber intake in adolescent boys. The study found that young men consumed macronutrients as recommended but did not consume micronutrients as recommended. The study found that energy intake from carbohydrates, fats, and proteins was still within the acceptable range. While micronutrient intake indicates that 50% of respondents do not consume Vitamin A and Vitamin B6 adequately and 75% of respondents do not consume magnesium, phosphorus, and zinc according to the recommended standards [6].

A study conducted by Farah in Bulaong District found that adolescent eating patterns were generally less varied. The level of adolescent nutrition adequacy is still far from the recommended nutritional adequacy rate. Energy intake from carbohydrate, protein, and fat sources is still very lacking. In India, a study reported that the majority of adolescents reported low intake, more than 30% of respondents did not consume vegetables. In addition, about 70% of respondents consume three or more energy-intensive snacks. Nearly half of the respondents (45%) did not consume fruit and 47% consumed high-energy drinks. In general, girls consume foods that are more nutritious than adolescent boys. Teenage girls consume more cereals, vegetables, fruits, and non-vegetarian food products than boys [7].

For vegetable and fruit consumption, several studies show that young women consume more vegetables and fruits than teenage boys. Although the practice is still far from expectations, teenagers' attitudes and preferences toward the consumption of vegetables and fruits show good results. One study found that attitudes toward fruit and vegetable consumption behavior showed that male respondents who had a good attitude toward fruit and vegetable consumption behavior amounted to 64% and female respondents amounted to 86.7%. Male respondents who had good food preferences for fruit and vegetable behavior were 92% and female adolescents were 95% [8].

Teenagers have an unhealthy diet. A study conducted by Atmarita found that men consume more sugar than women. Men tend to consume more salt than women. Total male fat intake is more than women [9]. Likewise, found by Alkazemi, all teens have an unhealthy diet. However, young women consume potato chips and high-salt and fat snacks and consume sweets more than twice a day [10].

Table 1: Distribution of intake of adolescents by gender

Nutrition intake	Boy				Girl				p
	Mean	SD	Min	Max	Mean	SD	Min	Max	
Energy	1471.7	435.6	381.86	2526.14	1368.3	4.55	504	2687.26	0.237
Protein	55.16	16.36	15.6	93.99	56.07	23.75	16.2	120.16	0.828
Fat	58.22	27.9	11.48	114.92	56.136	32.13	4.41	156.16	0.727
Carbohydrate	179.47	63.1	29	307.96	156.98	58.42	49.81	372.29	0.057
Fiber	6.45	3.2	1.05	14.95	5.88	3.2	0.99	16.42	0.905
Vit A	628.44	1537.6	6.5	7542	338.98	349.58	6.5	2052.85	0.128
Vit B6	0.83	0.368	0.22	1.99	0.87	0.404	0.18	1.93	0.595
Vit B9	114.48	96.097	10.75	534.55	94.48	59.18	21.95	279.8	0.172
Vit B12	0.88	0.636	0.05	2.94	0.82	0.55	0.05	2.58	0.617
Vit C	18.2	25.29	0	147.5	19.74	29.45	0	194.8	0.776
Fe	6.3	3.96	1.6	19.19	6.5	4.33	1.42	19.17	0.802
Zinc	5.58	2.49	1.54	13.56	5.74	2.88	1.83	15.33	0.738
Calcium	261.59	154.69	30	619.26	264.4	192.92	30.25	830.5	0.935

Table 2: Distribution of adolescent intake that meets 80% dietary allowed recommended based on gender

Nutrient Intake	Boy				Girl			
	Sufficient		Insufficient		Sufficient		Insufficient	
	n	%	n	%	N	%	n	%
Energy	2	4.8	40	95.2	13	18.1	59	81.9
Protein	24	57.1	18	42.9	42	58.3	30	41.7
Fat	12	28.6	30	71.4	28	38.9	44	61.1
Carbohydrate	4	9.5	38	90.5	6	8.3	66	91.7
Fiber	0	0	42	100	0	0	72	100
Vit A	8	19	34	81	17	23.6	55	76.4
Vit B6	10	23.8	32	76.2	29	40.3	43	59.7
Vit B9	2	4.8	40	95.2	0	0	72	100
Vit B12	3	7.1	39	92.9	4	5.6	68	94.4
Vit C	1	2.4	41	97.6	3	4.2	69	95.8
Fe	2	4.8	40	95.2	0	0	72	100
Zinc	0	0	42	100	3	4.2	69	95.8
Calcium	0	0	42	100	0	0	72	100

Recommendation

Nutritional intake in adolescents in Makassar still does not meet the recommended intake standards and does not differ in all sexes. Macronutrient and micronutrient intake in young men and women still does not meet the recommended nutritional adequacy rate.

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Accuracy of Actual Weight Measurement Using Upper arm Circumference in South Sulawesi Ethnics

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Abstract

BACKGROUND: Assessment of nutritional status in hospital patients is important to do. However, due to the patient's condition, the measurement must use an estimation formula. This study wanted to know the accuracy of the measurement of body weight from the formula commonly used in hospitals.

AIM: This study wants to see how accurate the actual body weight predictions are based on measurements of UAC in the ethnics in the province of South Sulawesi.

METHODS: The design of this study was cross-sectional. The population of this study was young adults aged 20–29 years. Number of sample is 896 respondents. Sampling consists of 2 stages, namely sample area and research sample. The sampling used was systematic random sampling. The sample size in this study was calculated using the Stanley Lemeshow formula.

RESULTS: The results showed that the formula used to predict the patient's weight, if the formula is calculated using the formula 100% Patient Upper Arm Circumference (PUAC), it is suitable for ethnic Bugis and Mandar male. The formula 90% PUAC is suitable for ethnic Bugis and Mandar and male ethnic Makassarese and Toraja. The formula 85% is suitable for women for all ethnicities.

CONCLUSION: It can be concluded that the accuracy of measuring body weight depends on gender and ethnicity, so it is expected that health practitioners in the hospital can adjust the use of formulas according to gender and ethnicity.

Introduction

Assessment of the nutritional status of hospitalized patients in hospitals is currently difficult because of the condition of patients who have to lie in bed. Adult and child patient body weight is usually difficult to measure before being given first aid/intervention [1]. Based on secondary data from Wahidin Sudirohusodo Hospital, from all patients in September–December 2015, only new patients who could measure their weight were only 23.33%. Some studies found that nearly 47% of patients who had just been admitted to hospital were suffering from malnutrition, and after being treated would increase to 69% [2].

Body weight is needed in the assessment of nutritional status, and determining the nutritional needs of patients. Measurement of body weight every week is an objective parameter, but what is an obstacle is that not all patients treated can be measured in body weight by weight scales. Weight has a relationship with other measurements, such as upper arm circumference (UAC) and body mass index (BMI). Several studies have shown that weight has a very strong relationship with UAC and BMI [3]. With this very strong relationship, weight, UAC, and BMI have the ability to be used as predictors of nutritional status [4].

Research on patients at Stanford University Hospital, San Francisco, United States, has obtained prediction results for UAC predictors and knee height [1]. In addition, there is a formula for predicting body weight from the calculation of combined knee height and UAC for blacks and whites. In China, studies have been conducted to predict body weight from the calculation of combined UAC and hip circumference. These formulas cannot be used as standards for Indonesia because the formula used is the result of research using samples that are physically different from Indonesian people [1].

In Indonesia, research has been carried out in the Nutrition Installation of the DR Hospital. Cipto Mangunkusumo for 1 week with a sample of adult age 19–56 years by obtaining formula equations in adults based on UAC with hip circumference and based on UAC with knee height to predict body weight. WHO stressed that adjustments to anthropometric standards in a country must be based on the results of research in the country concerned so that it is necessary to obtain an appropriate formula for Indonesian people. In the

context of ethnic and cultural diversity, each province in Indonesia certainly has its own ethnic characteristics and culture. One of them is South Sulawesi, which is a province in Indonesia, located in the southern part of the island of Sulawesi, with Makassar City as the capital. In general, there are four ethnic groups in the province of South Sulawesi, namely the Bugis, Makassar, Toraja, and Mandar Ethnics [5].

This study wants to see how accurate the actual body weight predictions are based on measurements of UAC in the ethnics in the province of South Sulawesi.

Materials and Methods

The research design was cross sectional. The study population was young adults aged 20-29 years. The sample in this study was partly young adults aged 20-29 years. The sampling method consists of 2 stages, namely the sample area and the research sample. To determine the area in this study, the method used to determine the selected District. District and Village was purposive sampling with reasons that represent the characteristics of the area. The sampling used was systematic random sampling. Systematic sampling by dividing the number or members of the population by the specified sample size. So that the sample is obtained according to the calculation results.

Samples were taken from all subjects that met the research criteria until the required number of samples was fulfilled. The inclusion criteria in this study were the two-sample parents were ethnicities included in the scope of the study, were not seriously ill (affected weight) for the past month, had no edema, were not pregnant, had no bone abnormalities, and were willing to participate as respondents in research. The sample size in this study was calculated using the Stanley Lemeshow formula. The estimated weight formula used in this study is based on a pocketbook commonly used in hospitals.

Results

In Table 1, it can be seen that in male, the largest measurement of actual body weight is found in the Toraja (58.60 kg) and the lightest is the Bugis (54.49 kg). Based on the results of the actual UAC measurements found that the greatest results were seen in the Mandar ethnics (27.237 cm) and the smallest was the Makassar ethnic (26.531 cm). Based on the ideal body weight, the results of the calculation are most found in the Bugis ethnic (59.12 kg) and the smallest is the Mandar ethnic (57.36 cm). Based on the results of the estimated body weight, the greatest results were found in the Toraja (59.90 kg) and the smallest found in the Makassar ethnic (58.217).

In women, the highest measurement of actual body weight was found in the Makassar ethnic (52.121 kg) and the lightest was the Toraja ethnic (49.7 kg). Based on the results of the actual UAC measurements found that the greatest results were seen in the Makassar ethnic (26.17 cm) and the smallest was the Toraja ethnic (24.7 cm). Based on the ideal body weight, the most calculated results are found in the Bugis ethnic (48.59 kg) and the smallest is the Mandar ethnic (47.824 cm). Based on the results of the estimated body weight, the largest results were found in the Bugis ethnic (49.315 kg) and the smallest one was found in the Toraja ethnic (46.7 kg).

In Table 2, it can be seen that by using the 100% UAC standard formula to calculate estimated body weight, it was found that the measurement value of estimated body weight in women differed significantly from the actual weight value ($p < 0.05$). Whereas in men, the measurement value was found to be different in the Makassar and Toraja ethnics, but it was found to be no

Table 1: Characteristic respondents

Measurement component	Male				Female			
	Bugis	Makassar	Mandar	Toraja	Bugis	Makassar	Mandar	Toraja
n	96	62	95	125	92	149	126	151
Actual weight (kg)								
Min	42.9	42.4	36.6	40.40	32.4	35.2	34.2	36.6
Max	81	69.7	82.6	123.50	80.5	91.5	81.6	80
SD	7.063	6.25	9.22	10.42	8.768	10.028	9.614	7
Mean	54.49	56.937	55.215	58.60	50.914	52.121	50.021	49.7
Upper arm circumference actual (cm)								
Min	21.8	20	21	19.60	20	19.8	19	19.1
Max	39.5	32	36	38.00	35	38	35.5	35.5
SD	2.536	2.394	3.087	2.99	3.277	3.56	3.785	2.4
Mean	26.54	26.531	27.237	26.97	26.055	26.173	25.969	24.7
Ideal weight (kg)								
Min	47	48.5	41	45.30	41.5	37	38	38
Max	65.25	68.67	68.4	70.47	62.1	59.85	58.14	60.2
SD	3.409	3.554	4.355	4.40	4.518	3.084	2.935	3.75
Mean	59.12	57.74	57.366	58.50	48.59	48.036	47.824	48.5
Estimated body weight (kg)								
Min	44.68	45.86	35.13	41.58	32.68	33.96	34.24	32.5
Max	82.45	74.93	78.84	97.53	75.61	71.19	68.36	78.5
SD	6.926	6.098	8.301	8.21	7.969	7.43	7.491	5.95
Mean	59.69	58.217	59.454	59.90	49.315	48.937	48.309	46.7

Table 2: Comparison of the results of measurements of actual body weight and estimated body weight using several formula in South Sulawesi Ethnics

Gender and etnic	The formula for percentage of standard upper arm circumference								
	100%			90%			85%		
	Mean actual weight (kg)	Mean estimati on weight (kg)	p-values*	Mean actual weight (kg)	Mean estimation weight (kg)	p-value *	Mean mean actual weigh (kg)	Mean estimation weight (kg)	p-value*
Female									
Bugis (92)	50.910	45.100	0.000	50.910	50.110	0.515	50.910	53.060	0.089
Makassar (149)	52.120	44.128	0.000	52.121	49.032	0.003	52.210	51.916	0.845
Toraja (151)	49.650	42.262	0.000	49.650	46.962	0.000	49.65 0	49.724	0.927
Mandar (126)	50.020	43.749	0.000	50.021	48.610	0.198	50.021	51.471	0.196
Male									
Bugis (96)	54.480	53.325	0.224	54.480	59.250	0.000	54.480	62.740	0.000
Makassar (62)	56.940	51.994	0.000	56.937	57.764	0.453	56.937	61.166	0.000
Toraja (125)	58.600	53.711	0.000	58.601	59.678	0.360	58.601	63.189	0.000
Mandar (95)	55.220	53.455	0.150	55.215	59.390	0.001	55.215	62.880	0.000

*paired t test Significant value if p <0.05

different in the Bugis and Mandar ethnics (p = 0.224 and p = 0.150). It appears that the value of the estimated body weight is smaller than the actual weight.

Using the 90% standard UAC formula to calculate estimated body weight, it was found that the estimated weight values for women were found to be significantly different in the Makassar ethnic (p = 0.003) and Toraja (p = 0.000). However, the value was found to be no different in the Bugis ethnic (p = 0.515) and Mandar (p = 0.198). Whereas in men, the measurement values were found to be significantly different in Bugis (p = 0.000) and Mandar ethnics (p = 0.001). However, this value was found to be no different in the Makassar ethnic (p = 0.453) and Toraja (p = 0.360). It appears that the value of the estimated body weight is greater than the actual body weight.

Using the 85% standard UAC formula to calculate estimated body weight, it was found that the measurement value of estimated body weight in women did not differ significantly in all ethnics, namely Bugis (p = 0.089), Makassar (p = 0.845), Toraja (p = 0.927), and Mandar (p = 0.196). However, the value was found to be no different in the Bugis ethnic (p = 0.515) and Mandar (p = 0.198). Whereas in men, the measurement values were found to be significantly different in Bugis (p = 0.000) and Mandar ethnics (p = 0.001). However, this value was found to be no different in the Makassar ethnic (p = 0.453) and Toraja (p = 0.360). It appears that the value of the estimated body weight is greater than the actual body weight. Whereas in men, it was found that the measurement value of estimated body weight using 85% standard UAC differed significantly in all terms (p < 0.000). It appears that the value of the estimated body weight is greater than the actual body weight.

Discussion

Differences in body size in various ethnicities are influenced by several factors such as gene and environmental factors. Linasari, who examined differences in Balinese ethnic body proportions and Madurese ethnicity, found that the Madurese were found to be smaller in body size than Balinese ethnicity. Ethnic Madurese apparently have a shorter height, lighter weight, and smaller UAC compared to Balinese, although the difference is not significant [6]. The same was found by Nidiaputri, who looked at a comparison of anthropometry of Indonesian female students based on the three largest ethnics in Indonesia. The study found that the dimensions of Javanese hand lengths were the largest compared to Batak and Sundanese ethnic groups. Meanwhile, the Batak ethnic group has wider and thicker hand dimensions than the Javanese and Sundanese. The study also found that when compared to other countries, such as Bangladesh, Vietnam, Hong Kong, Nigeria and the United Kingdom, the dimensions of Indonesian women tended to be longer and thicker than those of Vietnam and Bangladesh. As for the size of the hand width, Indonesian women have the smallest size of all comparison countries [7].

Anthropometric differences between ethnicities are associated with genetic factors. In addition to environmental influences that affect individual growth, genes affect physical conditions because they are inherited by parents to their offspring biologically. Inherited gene expression and growth patterns are embraced by biological systems that operate in the appropriate environment. This biological system is like the role of genes that regulate the release and regulate the activation of growth hormones [8]. This explanation is reinforced by observations made by Artaria [9]. From the results of research on two different ethnicities, it was seen that the body size of the two ethnic groups began to differ after the age of puberty [9].

In assessing nutritional status, especially in special circumstances, such as in the elderly or patients who cannot stand upright, certain formulas have been prepared using other anthropometric components that are in accordance with the specific conditions. The results show that the results of the estimated anthropometric component calculations are in accordance with the results of the actual measurements, but some are different. Like a study conducted by MY Jung [10], who found that the estimated body weight calculated from the knee height equation was significantly higher than the actual body weight in ethnic Chinese [10]. Similarly, the study conducted by Ariyani found that the UAC threshold

which has the most optimal value of sensitivity and specificity and positively correlated in Indonesian women is 24.95 or 25 cm. Higher than the standard commonly used is 23.5 cm [4].

However, there are also studies that find that different anthropometric components can be used to determine nutritional status. Like the study conducted by Mulyasari, who found that the UAC was associated with significant body weight and length of the ulna also significantly associated with height. Thus, the circumference of the upper arm can be used to predict body weight while the length of the ulna can be used to predict height [11].

Recommendation

From this study, it can be seen that based on the formula commonly used to predict the patient's body weight, if the formula is calculated using the formula 100% patient UAC (PUAC), then it is suitable for Bugis and Mandar Ethnic men. The use of the formula 90% PUAC is suitable for ethnic Bugis women and ethnic Mandar and male ethnic Makassarese and ethnic Toraja. The use of the formula 85% is suitable for women for all ethnicities, namely Bugis, Makassar, Toraja, and Mandar.

Conclusion

From this study it can be seen that based on the formula commonly used to predict the patient's body weight, if the formula is calculated using the formula 100% Patient Upper Arm Circumference, then it is suitable for Bugis and Mandar Ethnic men. The use of the formula 90% Patient Upper Arm Circumference is suitable for ethnic Bugis women and ethnic Mandar and male ethnic Makassarese and ethnic Toraja. The use of the formula 85% is suitable for women for all ethnicities, namely Bugis, Makassar, Toraja and Mandar.

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Analysis of Factors Affecting the Unmet Need Incidence in Couples of Childbearing Age in the West Bulotadaa Village Gorontalo City in 2019

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Abstract

BACKGROUND: Population that continues to increase is a big problem for countries in the world, especially developing countries. One of the problems in the management of family planning programs is the high level of unmet need for family planning in Indonesia. Unmet need is the number of couples of childbearing age who want to postpone pregnancy or do not want additional children but do not use birth control methods.

AIM: The aim of the study was to determine the determinants of the occurrence of unmet need in fertile age couples in the West Bulotadaa Village, Gorontalo City.

METHODS: The study design was cross-sectional with a sample of 146 fertile age couples selected by systematic random sampling. Data collection was made, using questionnaires containing questions from the research variables. Data were analyzed by multiple logistic regression analysis through the SPSS for windows program.

RESULTS: The visit of KB officers affected the unmet need with $p = 0.032$ ($p < 0.05$) with OR = 2.893, and there were some variables that were not significant such as the age variable $p = 0.766$ ($p > 0.05$), family income $p = 0.189$ ($p > 0.05$), distance of family planning services $p = 0.057$ ($p > 0.05$), and cost of contraception $p = 0.632$ ($p > 0.05$).

CONCLUSION: It was concluded that the visit of family planning officers affected the unmet need and age, family income, distance to the place of family planning services and the cost of contraceptives did not affect the incidence of unmet need in West Bulotadaa, Gorontalo City.

Introduction

Realizing the highest degree of maternal health is one of the development agendas covered by the health component's sustainable development goals development objectives, namely, achieving universal access to reproductive health services. There are four parameters used to assess access to reproductive health services, namely, active participation in family planning contraceptive prevalence rate (CPR), birth rates in adolescent girls aged 15–19 years ago [1].

Recent data on unmet needs in the Pakistan Demographic and Health Survey revealed a CPR of 29.6%, where the use of modern methods was only 21.7%. On the other hand, 55% of women want to use family planning, but family planning services and programs fail to meet demand and result in unmet needs of 25% [2]. Unmet need and CPR will affect TFR, which in turn will affect maternal mortality rate. Unmet need can have an impact on the occurrence of KTD, which is high in Indonesia [3].

Unmet need for family planning is a multidimensional problem because it is influenced by various factors such as demographic, socio-economic characteristics, attitudes, and service access. In general, unmet need for family planning is common among women who face financial, educational, geographical, and social barriers. Other factors in the community, such as culture, service quality, presence of transportation routes, and regional characteristics play a role in the use of contraceptives [4]. The Gorontalo Province is one of the provinces with a greater percentage of provincial unmet needs than national unmet needs. Where the percentage of national unmet need is 10.6%, which is divided into thinning categories by 6.5% and restrictions as much as 4.1% while the province of Gorontalo the percentage of unmet need is 12.9% which is divided into thinning categories by 3.9% and restrictions at 9.15% [5].

Based on data from the BKKBN Gorontalo Province in 2019, regencies or cities with the highest unmet need figures are in Gorontalo City at 13.6% and the lowest was in Boalemo Regency with 5.8%.

Furthermore, in Gorontalo City the highest unmet need number was in Sipatana sub-district with 21.9% with the highest percentage of Unmet need village occurring in West Bulotadaa Village at 57.4% and the lowest was in Molosipat U village at 4% [6].

The high number of unmet need in Gorontalo City compared to other districts in Gorontalo Province is 13.6% in 2019. Sipatana sub-district is the highest sub-district with a percentage of unmet need of 21.9% and village with the highest unmet need percentage are in West Bulotadaa Village is 57.4%, so this study aims to determine the determinants of unmet need in the West Bulotadaa Village Gorontalo City.

Materials and Methods

This research is an observational analytic study and the design used was cross-sectional study. This research was conducted from October 2019 to November 2019 in Bulotadaa Barat Village, Sipatana District, Gorontalo City.

The population in this study was all couples of childbearing age group of 15–49 years old and recorded at the Family Planning Center of West Bulotadaa Village in 2019 amounted to 705 couples of childbearing age. The sample of this research is 146 fertile age couples with a systematic random sampling technique.

Collection is done by distributing questionnaires that contain questions related to the research variables given to respondents selected as research samples in Kelurahan Bulotadaa Barat Gorontalo City.

Analysis techniques of this study used univariate analysis, bivariate analysis with test Chi-square and multivariate analysis with multiple logistic regressions in the SPSS for Windows Program.

Results

Table 1 shows the characteristics of respondents consisting of age, education, and occupation. The majority of respondents in the age group of >35 years were 71 respondents (48.6%), while five respondents (3.4%) were in the age group of <20 years. For education variables, the most respondents were elementary school education by 50 respondents (34.2%), while the fewest respondents with D3 education were one respondent (0.7%). Job variable shows that most respondents are non-employed/IRT respondents, namely, 105 respondents (71.9%), while the least number of respondents who work as farmers are one respondent (0.7%).

Table 1: Characteristics of respondents in the district of West Bulotadaa

Characteristics	n	%
Age (years)		
<20	5	3.4
20–35	70	47.9
>35	71	48.6
Education of respondents		
Elementary school	50	34.2
Middle school	34	23.3
High school	43	29.5
D3	1	0.7
S1	16	11.0
S2	2	1.4
Work		
Private	13	8.9
IRT	105	71.9
Trader	15	10.3
Civil servants	10	6.8
Labor	2	1.4
Farmers	1	0.7

Table 2 shows the distribution of respondents based on research variables. The distribution of respondents based on events unmet need, the majority of respondents who met need were 91 (62.3%) while respondents with unmet needs were 55 (37.7%). The age distribution of respondents mostly in the risk age group is 76 respondents (52.1%), while the respondents in the age group are not at risk as many as 70 respondents (47.9%). The distribution of family income to respondents is mostly on high family income, as many as 101 respondents (69.2%), while respondents with low education are 45 respondents (30.8%). The distribution of family planning visits by respondents to most respondents who had never been visited was 112 respondents (76.7%), while respondents who had been visited were 34 respondents (23.3%). Distribution of distance to family planning services, the majority of respondents who are close to family planning services are 134 respondents (91.8%), while respondents who live far from family planning services are 12 respondents (8.2%). The cost distribution of contraceptives to most respondents is the cost of affordable contraceptives as many as 142 respondents (97.3%), while respondents who are not affordable contraception costs are four respondents (2.7%).

Table 2: Distribution of respondents by research variables in West Bulotadaa village

Variable	Amount (n)	Percentage (%)
Unmet need incident		
Unmet need	55	37.7
Met need	91	62.3
Age		
Risky	76	52.1
No risk	70	47.9
Family income		
Low	101	69.2
High	45	30.8
Visit of KB Officers		
Never	112	76.7
Ever	34	23.3
Distance of KB services		
Far	12	8.2
Close	134	91.8
Cost of contraception		
Unreachable	4	2.7
Affordable	142	97.3

Table 3 shows the distribution of respondents based on research variables on the occurrence of

Table 3: Factors affecting unmet need in fertile age couple village West Bulotadaa

Variable	Unmet need KB						p value
	Unmet need		Met need		Amount		
	n	%	n	%	n	%	
Age							
Risky	30	39.5	46	60.5	76	100.0	0.766
No risk	25	35.7	45	64.3	70	100.0	
Family Income							
Low	34	33.7	67	66.3	101	100.0	0.189
High	21	46.7	24	53.3	45	100.0	
Visit of KB officers							
Never	48	42.9	64	57.1	112	100.0	0.032
Ever	7	20.6	27	79.4	34	100.0	
Distance of KB service area							
Far	8	66.7	4	33.3	12	100.0	0.057
Close	47	35.1	87	64.9	134	100.0	
Cost of contraception							
Unreachable	2	50.0	2	50.0	4	100.0	0.632
Affordable	53	37.3	89	62.7	142	100.0	

unmet need. Unmet need occurs more at risk age groups (<20 years and> 35 years) that is as many as 30 respondents (39.5%) compared to those who are not at risk (20–35 years), i.e., as many as 25 respondents (35.7%) with a value of p > 0.05. Unmet need is more common in respondents with low family income as many as 34 respondents (33.7%) compared to respondents with high family income, as many as 21 respondents (46.7%) with a value of p > 0.05. Unmet need is more common in groups that have never been visited by family planning officers, as many as 48 respondents (42.9%) compared to groups of respondents who have been visited, as many as seven respondents (20.6%) with a value of p < 0.05. Unmet need is more common in groups where respondents are close to family planning services, namely, 47 respondents (35.1%) compared to the group of respondents who have been visited, as many as 8 respondents (66.7%) with a value of p > 0.05. Unmet need is more common in the group that is affordable by the cost of contraceptives as many as 53 respondents (37.3%) compared to the group that is not affordable by contraception costs which is as much as two respondents (50.0%). with a value of p > 0.05

Table 4 shows the conclusions of multivariate analysis with multiple logistic regressions. Of thefive independent variables included in the test simultaneously only family planning visits by the staff of consistent significance. Hence, it can be concluded that the visit of family planning officers with an OR value of 2.893 >1 is a risk factor with a lower-upper value = 1.163–7.199, which means couples of childbearing age who have not received family planning visits during the past 6 months have the possibility of 2893 times greater unmet need for KB compared to couples of childbearing age who have been visited by family planning officers in the past 6 months.

Table 4: Multivariate analysis of unmet need events in the West Bulotadaa Village

Variable	B	Df	p value	OR	95% CI for exp. (B)	
					Lower	Upper
Visit of family planning officers	1,062	1	0.022	2.893	1.163	7.199

Nagelkerke R^2=0.054

Discussion

This study shows that the visit of a family planning officer in the West Bulotadaa Village affected the unmet need incident. Most respondents have not been visited by family planning staff during the past 6 months; so many couples of childbearing age do not get more information about family planning, especially for the prevention of side effects of birth control. In addition, most respondents who were not at home were also the reason that respondents felt they had never been visited so that when family planning officers came to deliver information to couples of childbearing age, they were outside the home.

This research is in line with research conducted by Ayuningtyas *et al*. [7] in NTB which suggested that the visit of family planning staff was a factor influencing the unmet need. This study is not in line with research conducted by Sulikhah *et al*. (2016) in Purworejo Regency which suggested that the visit of health workers was not related to the unmet need for family planning in Purworejo.

This study also shows that age, family income, distance to family planning services, and the cost of contraception do not affect the incidence of unmet need in West Bulotadaa Village. For age variables, respondents assume that at age <20 years are too young to use contraception and there is a prohibition on husbands to use contraception at a too young age. While at the age of >35 years, many respondents assume that it is no longer a reproductive period and consider themselves to be old so that the possibility of pregnancy occurring is very small. This study is in line with research conducted by Sariyati *et al*. [8] in Yogyakarta which suggests that there is no significant relationship between wife's age and unmet need. Other research also conducted by Nzokirishaka and Itua [9] in Burudi suggested that younger ages (18–24 years) had higher needs that were not met for family planning.

For the family income variable, low family income is not a factor of unmet need childbearing age, this is because the cost of contraceptives in West Bulotadaa is affordable, and even many can use BPJS to the Puskesmas to get free contraception. Thus, income is not a factor influencing fertile age couples for the utilization of health services in the West Bulotadaa Village. In addition, the distance to family planning services in this case the Puskesmas is close enough to be reached on foot so that there is no need to ride a public vehicle (bentor and motorcycle taxi) to incur costs.

This research is not in line with research conducted by Ayuningtyas *et al*. [7] in West Nusa Tenggara which suggests that income levels can affect the unmet need for family planning through various means, such as disagreement about contraception, inadequate information, and financial problems in daily

needs. Other research was also conducted by Uljannah *et al*. [10] who suggested that income was not related to unmet need events in Adiwerna Village.

For the variable distance to family planning services, the distance from the respondent's house to family planning services in this case the Puskesmas is close enough to be walked on foot <2 km so there is no need to ride a public vehicle (bikes and motorcycle taxi). Many people choose to walk to the family planning service. However, the close distance is not a preventative factor for a person who does not need unmet; this can be seen that more respondents distance from the respondent's house to a family planning service location is close but still choose not to use contraception (unmet need). This is caused by the lack of family planning staff visits to socialize family planning. The family planning center is more focused on implementing posyandu and rarely does counseling related to contraception. Respondents' fear of side effects also requires counseling from PLKB cadres and local health centers. This study is not in line with research conducted by Eliason *et al*. [11] in Ghana which suggests that distance to health facilities affects unmet need for family planning in Ghana.

For the variable cost of contraception, the results of this study found that affordable or low costs are not a guarantee that women will use contraception [12], [13]. There are still other factors that determine whether a woman will use contraception or not. Government programs that make contraceptive costs cheaper seem to have not been very successful in handling unmet need for family planning in the West Bulotadaa Village when viewed from the results of the above research. Most of the respondents use BPJS for free but the collaboration between the government and family planning officers is still lacking in providing information about the family planning itself. This study is in line with research conducted by Putro and Listyaningsih [14] which suggests that the cost of contraceptives does not have a significant effect on the incidence of unmet need for family planning.

Conclusion

It was concluded that the visit of family planning officers affected the unmet need and age, family income, distance to the place of family planning services and the cost of contraceptives did not affect the incidence of unmet need in West Bulotadaa, Gorontalo City.

Recommendation

It is expected that the government, family planning field officers and health workers will work together to give more attention to visits every 6 months, especially for socialization related to the use of contraception to reduce the prevalence of unmet need.

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Effect of Honey Variation on Blood Glucose Level in Pregnant Wistar Rats (*Rattus norvegicus*)

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Abstract

BACKGROUND: In addition to *Moringa* one of the food products that are often used as supplements is honey. Honey contains carbohydrates and content of antioxidants and other active substances needed during pregnancy.

AIM: This study aimed to look at the effect of the intervention on the blood glucose levels of normal white pregnant Wistar strain of *Moringa* honey, honey plus *Moringa* or natural honey interventions.

METHODS: This research method uses a quantitative research with experimental lab research type. With a completely randomized pre-test-post-test controlled completely randomized research design. The samples in this study were 24 white Wistar pregnant rats, divided into four groups, the control group, the honey group, the honey plus *Moringa* group, and the *Moringa* honey group, each consisting of six animals. The intervention was carried out for 20 days with initial BB measurements pregnancy (pre) and end of pregnancy (post). Data analysis used paired t-test and one-way ANOVA test.

RESULTS: GD levels showed a significant decrease in GD levels in all groups at the end of pregnancy with a $p < 0.05$, but a decrease in GD levels between groups did not show a significant difference at the end of the study, the control group (82.33 ± 8.98), honey (83.83 ± 6.67), plus honey (73.17 ± 10.92), and *Moringa* honey (73.00 ± 6.45) with a $p = 0.065 > 0.05$.

CONCLUSION: It shows that honey variation has the effect of controlling blood glucose levels during pregnancy.

Introduction

The problem of nutritional status in infancy and toddlers is closely related to nutrition problems in pregnant women. The condition of pregnant women provides a very large influence on the growth and development of the baby in the womb. For this reason, the government's efforts to overcome this problem have been focused since the fetus was in the womb or when the mother was pregnant. This program is known as a thousand early days of life and has been established through Presidential Regulation no. 42 of 2013 concerning the National Movement for the Acceleration of Nutrition Improvement [1].

Micronutrients have been shown to affect fertility, embryogenesis, and placentation. Micronutrient supplementation has been widely used to prevent abnormalities in pregnancy outcomes. Malnutrition in pregnant women can cause pregnancy complications, low-birth weight babies, increase the risk of degenerative diseases such as hypertension, coronary heart disease, and type 2 diabetes [2].

Increased insulin resistance in pregnant women increases to 80% in the second and third trimester of pregnancy. This problem is increasing along with increasing gestational age in pregnant women, causing an increase in blood glucose levels, this if not addressed will increase the risk of gestational diabetes mellitus that often occurs in pregnant women. According to data from the American Diabetes Association in 2000, about 7% of gestational diabetes mellitus occurs during pregnancy each year, where the prevalence of gestational diabetes mellitus varies between 1% and 14%. In Indonesia, the prevalence of gestational diabetes mellitus is in the range of 1.9–3.6% [3].

One good source of nutrients is *Moringa* leaves and honey (*Moringa oleifera*), *Moringa* is known worldwide as a nutritious plant and the World Health Organization (WHO) has introduced *Moringa* as an alternative food to overcome nutritional problems (malnutrition) while honey is known to be a one of the foods that have been used for generations as a traditional medicine. In Africa and Asia *Moringa* leaves are recommended as a nutrient-rich supplement for breastfeeding mothers and children during infancy [4].

Research on the nutritional content of *Moringa* leaves has been widely stated, one of them is research, stating that in other studies show that in 100 grams of fresh *Moringa* leaves have a water content of 94.01%, 22.7% protein, 4.65% fat, 51 carbohydrates, 66%, 7.92 fiber, and 0% energy [5]. *Moringa* leaves contain

phenols in large quantities which are known as antidote to *Moringa* leaves that have been extracted are 1.6% [6] while honey is known to have many health benefits. The content of nutrients in honey is carbohydrates, proteins, amino acids, vitamins, and minerals. Vitamins contained in honey include Vitamin B1, B2, B3, B6, C, A, and E, while for the mineral content such as Na, Ca, K, Mg, Cl, Fe, Zn, and others, honey also contains flavonoids honey is believed to be beneficial for health because of the antioxidant ability of honey [7].

In a study conducted by Odedele *et al*. using *Moringa* seed extract given to diabetic pregnant mice showed that giving *M. oleifera* seed extract in pregnant mice with diabetes could reduce blood glucose levels in pregnant mice and play a role in reducing fetal morbidity and mortality [8]. In addition, studies have shown that giving honey together with *Moringa* leaf extract in pregnant women has been proven to prevent DNA damage [9].

Honey and *Moringa* (*M. oleifera*) are food ingredients that are commonly found in areas that have great potential to become herbal supplement ingredients. *Moringa* honey products are needed as a supplement for pregnant women for the needs of macro- and micro-nutrients. To increase the nutritional content of honey, honey-producing bees are usually given additional food in the form of sugar water mixed with other ingredients that contain the desired nutrition [10].

Based on data on the nutritional content of *Moringa* and honey and their health benefits, especially pregnant women researchers are interested in seeing the effects of weight gain in white Wistar rats (*Rattus norvegicus*) pregnant women given *Moringa* honey, honey plus *Moringa*, and natural honey.

Materials and Methods

The research process in the experimental animals was carried out at the Laboratory of Immunology and Molecular Biology, Microbiology Section of the Faculty of Medicine, Universitas Hasanuddin. This research is a quantitative research with experimental lab research type. With a completely randomized pre-test and post-test controlled (RAL) research design.

The population of this study was female Wistar white rats aged 10–12 weeks weighing 110–150 grams while the samples in this study were pregnant female Wistar strain rats that met the study inclusion criteria. Animal samples were divided into four groups with each group consisting of six pregnant Wistar rats, namely, the control group, natural honey, honey plus *Moringa*, and *Moringa* honey with honey doses of 0.27 ml/rat/day given orally for 20 days of pregnancy by measuring blood glucose levels in early pregnancy and late pregnancy.

The data collected in this study are primary data obtained from laboratory results in the form of test results of nutrient and phytochemical content of honey, *Moringa*, and *Moringa* honey as well as the results of the treatment of experimental animals.

Data processing was performed using a computer with the SPSS 20 program by comparing measurement results before and after treatment using paired t-test/Wilcoxon test and one-way ANOVA/ Kruskal–Walls test to see the results of the comparison between groups presented in tabular and graphic form with narrative with a significance value of $p < 0.05$.

Results

Blood glucose in this study was measured using a nescometer. Measurements were taken at 0 days before the intervention (pre-test), 2 weeks after the intervention and at the end of 20 days (post-test).

Figure 1 shows the data on the state of blood glucose in pregnant Wistar rats. The blood glucose in the lowest control group was found in rat C with a blood glucose level of 73 mg/dL and the highest blood glucose level was found in rat B with a glucose level of 177 mg/dL. In the honey group, the lowest blood glucose level was found in mice C with blood glucose levels of 93 mg/dL and the highest blood glucose levels were found in mice B with blood glucose levels of 139 mg/dL. In the honey plus *Moringa* group, the lowest blood glucose level was found in rat D with blood glucose level of 63 mg/dL and the highest blood glucose level was found in rat A with blood glucose level of 131 mg/dL. In the *Moringa* honey group, the lowest blood glucose level was found in rat F with blood glucose level of 105 mg/dL and the highest blood glucose level was found in rat C with blood glucose level 128 mg/dL.

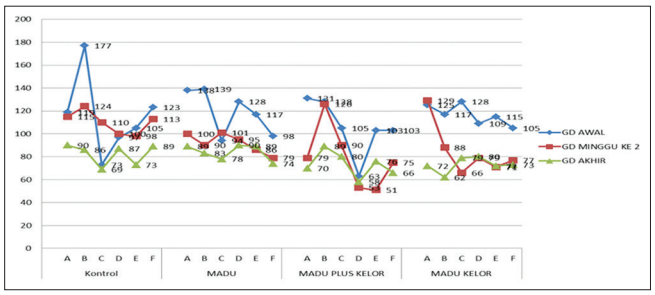

Figure 1: Description of blood glucose levels in pregnant Wistar rats

At 2 weeks gestation, the lowest blood glucose level in the control group was found in rat E with a blood glucose level of 98 mg/dL and the highest blood glucose level was found in rat B with a blood glucose level of 124 mg/dL. In the honey group, the lowest blood glucose level was found in F rat with blood glucose level of 79 mg/dL and the highest blood glucose level was in C mouse with blood glucose level of 101 mg/dL,

in the honey group plus *Moringa* the lowest blood glucose level in pregnant mice found in rat E with a blood glucose level of 51 mg/dL and the highest blood glucose level found in rat B with a blood glucose level of 126 mg/dL, while in the *Moringa* honey group the lowest blood glucose level was found in rat C with a blood glucose level of 66 mg/dL and the highest blood glucose level was found in rat A with blood glucose level of 129 mg/dL (Figure 1).

At the end of pregnancy at the age of 20 days, the lowest control blood glucose level was found in rat C with a blood glucose level of 69 mg/dL and the highest blood glucose level was in mouse A with a blood glucose level of 90 mg/dL, in the honey group, the lowest blood glucose level was found in rat F with blood glucose level of 74 mg/dL and the highest blood glucose level was in rat D with blood glucose level of 90 mg/dL, in the honey group plus *Moringa* the lowest blood glucose level was found in rat D with blood glucose levels of 58 mg/dL and the highest blood glucose levels were found in mice B with blood glucose levels of 89 mg/dL, whereas in the *Moringa* honey group the lowest blood glucose levels were found in mice B with blood glucose levels of 62 mg/dL and the highest blood glucose levels were found in rat D with a blood glucose level of 80 mg/dL (Figure 1).

In Table 1, the state of blood glucose levels in pregnant Wistar rats in early pregnancy showed the results of paired T-test in the control group that there was a decrease in blood glucose levels with an average initial blood glucose of 115.67 ± 34.95 at the end of pregnancy the mean reduction in blood glucose levels of pregnant rats was 82.33 ± 8.98 and showed a significant decrease with a p value of 0.045 <0.05. The honey group was a decrease in mean blood glucose levels of pregnant mice with a mean initial blood glucose level of 119.00 ± 19.55 indicating a decrease in mean blood glucose levels at the end of pregnancy with a mean value of 83.83 ± 6.67 and showing a significant decrease with a p value of 0.002 <0.05 at the end of pregnancy.

In the honey plus *Moringa* group also showed a decrease in blood glucose levels in pregnant Wistar rats with an average initial blood glucose of 105.50 ± 24.39 experienced a significant decrease in late gestational age with mean blood glucose levels in pregnant Wistar mice to 73.17 ± 10.92 with a p value of 0.008 <0.05. In the *Moringa* honey group also showed a significant decrease in blood glucose levels in Wistar rats with an average initial blood glucose level of 116.50 ± 8.89 at the end of pregnancy mean blood glucose levels in pregnant Wistar rats showed a significant decrease to 73.00 ± 6.45 with a p value of 0.000 <0.05 (Table 1).

Meanwhile, the one-way ANOVA test showed no significant difference in decrease in blood glucose levels between treatment groups with a p = 0.774 > 0.05 in early pregnancy. At the end of pregnancy also showed a decrease in blood glucose levels that were not significant between groups with a p = 0.065> 0.05. In the delta test results, the mean difference in blood glucose levels early in pregnancy and in the end of pregnancy pregnant Wistar rats showed the mean difference in the reduction of initial and final blood glucose levels in the control group by 33.33 ± 30.82, in the honey group by 35.17 ± 15.34, in the honey plus *Moringa* group by 32.33 ± 18.53, and in the *Moringa* honey group by 43.50 ± 10.91 with a significance value of 0.771 > 0.05 which means that there was no difference in the decrease in blood glucose levels between groups in pregnant Wistar rats (Table.1).

Even though statistically did not show a significant difference in the final blood glucose level of pregnant Wistar rats, p = 0.065 indicates there is a tendency that leads to significant collar or significant borderline within acceptable limits; therefore, it will proceed to the *post hoc* LSD test (Table 1).

Based on Table 2, there is a significant value of final blood glucose levels in the honey group with honey plus *Moringa* with a p = 0.041 and between the honey group with *Moringa* honey with a p value of 0.038 while in the control group, honey, honey plus *Moringa,* and *Moringa* honey are in a significant borderline value, whereas in the honey plus *Moringa* and *Moringa* honey groups did not show significant differences in final blood glucose levels.

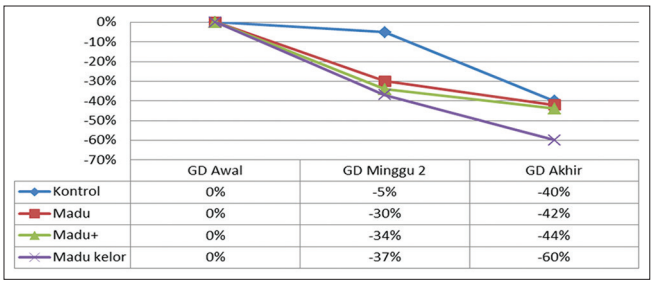

Figure 2: Percent graph average decreased blood glucose levels of pregnant Wistar rats

Figure 2 shows that the blood glucose levels of all pregnant Wistar rats decreased at 2 weeks and the end of pregnancy, where at the end of pregnancy in the *Moringa* honey group had the highest average reduction in blood glucose levels by 60%, the honey group plus *Moringa* with a decrease of 44%, the honey group by 42% and the lowest percent average decrease in blood glucose levels in the control group by 40%.

Table 1: Analysis of blood glucose levels in pregnant Wistar rats early in pregnancy and late in pregnancy

Variable	Kelompok				p**
	Kontrol	Madu	Madu + Kelor	Madu Kelor	
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	
GD awal	115.67 ± 34.95	119.00 ± 19.55	105.50 ± 24.39	116.50 ± 8.89	0.774
GD akhir	82.33 ± 8.98	83.83 ± 6.67	73.17 ± 10.92	73.00 ± 6.45	0.065
p*	0.045	0.002	0.008	0.000	
□ mean selisih GD awal dan GD akhir	33.33 ± 30.82	35.17 ± 15.34	32.33 ± 18.53	43.50 ± 10.91	0.771

Paired t-test, **one-way ANOVA.

Table 2: LSD test blood glucose levels in pregnant wistar rats late in pregnancy

Kelompok Perlakuan	Kelompok perlakuan			
	Kontrol	Madu	Madu+Kelor	Madu Kelor
	Nilai Sig	Nilai Sig	Nilai Sig	Nilai Sig
Kontrol		0.762	0.075	0.070
Madu	0.762		0.041	0.038
Madu+Kelor	0.075	0.041		0.973
Madu Kelor	0.070	0.038	0.973	

Discussion

The study showed GD levels determined a significant decrease in the final group of the study, but the decrease in GD levels between groups did not show a significant difference at the end of the study.

Pregnancy is one of the factors that can increase blood glucose levels. During pregnancy, physiological changes occur in pregnant women, namely, increased production of certain hormones such as hPL, estrogen, progesterone, cortisol, and prolactin. These hormones can cause insulin resistance, which results in high blood glucose levels while insulin levels also remain high [11].

During early pregnancy, there are anabolic conditions associated with hyperphagia and accumulation of body fat. Conversely, during late pregnancy there are catabolic conditions associated with insulin resistance where not only glucose but also free-fatty acids and ketone bodies can function as important sources of energetic substrates during fasting conditions [12], [13]. During pregnancy, there are two main metabolic problems. First, there is the possibility of gestational diabetes where the level of insulin secretion cannot overcome insulin resistance that occurs at the end of pregnancy. Second, there is an increased tendency for hypoglycemia that occurs not only in humans [14] but also mice [15].

Initial blood glucose levels in pregnant Wistar rats showed that there were mice in the control group who had diabetes with blood glucose levels of 177 mg/dL and in the honey group there were mice that had prediabetes with blood glucose levels of 138 and 139 mg/dL, this classification was based on data criteria for normal rat blood glucose levels are in the range of 50–135 mg/dL, prediabetes is 136–149 mg/dL, and diabetes ≥150 mg/dL [16]. The state of high blood glucose levels is thought to be due to the treatment when taking blood in Wistar rats through the tail which must be repeatedly pierced so that blood can be drawn and measured. In this study, the results showed that there was a decrease in blood glucose levels in pregnant Wistar rats in early pregnancy to the end of pregnancy in both the control group and the intervention group for significant honey variations while in the one-way ANOVA test results showed that there was no significant difference in decreased blood glucose levels in control pregnant Wistar rats and honey variation intervention groups. This is in line with several reports which show that during late pregnancy there is an increasing tendency for hypoglycemia in not only mice [15] but also humans [14].

Although the results showed no significant difference in the decrease in blood glucose levels in pregnant Wistar rats with an average percent decrease in blood glucose levels of all groups by 46% at the end of pregnancy, the average reduction in blood glucose levels in the intervention group honey variation was better than in the control group, where the average percent decrease in blood glucose levels in the control group was around 40%, 42% honey group, 44% honey plus *Moringa,* and *Moringa* honey 60%.

In a study conducted by Odedele *et al*. using *Moringa* seed extract given to diabetic pregnant mice showed that giving *M. oleifera* seed extract in pregnant mice with diabetes can reduce blood glucose levels in pregnant mice [8], in other studies have shown that consumption of metformin combined with honey is more effective at lowering serum glucose than only consuming metformin alone, as well as consumption of glibenclamide combined with honey is more effective at lowering serum glucose than only consuming glibenclamide alone [17]. Other results show that stevia and honey can reduce blood glucose levels [18].

Laboratory test results show that honey plus *Moringa* and *Moringa* honey contains antioxidants, flavonoids, polyphenols, Vitamin C, and carbohydrates. The content of honey is thought to have an important role in reducing blood glucose levels in pregnant Wistar rats.

Honey is a sweet liquid because it is dominated by carbohydrates in the form of fructose and glucose [7]. Based on laboratory test results the carbohydrate content of *Moringa* honey is 72.17% and in honey plus *Moringa* is 56.56%, this means that the sugar content in *Moringa* honey is higher than honey plus *Moringa*, carbohydrates are an energy source in honey which is dominated by fructose and glucose. This fructose content enters the cell, starting during the absorption process of the fructose content by the intestinal wall. In the apical membrane of the intestinal epithelium, there are two transporters, namely, sodium-glucose transporter (SGLUT1) which is a glucose and galactose transporter and glucose transporter 5' (GLUT 5) which is a fructose transporter. Fructose is transported from the intestinal lumen to epithelial cells through GLUT 5 by simple diffusion due to differences in concentration, from high to low concentrations. GLUT 5 has a high affinity for fructose. Fructose does not need insulin mediators to enter the cell [19].

In addition to fructose content in *Moringa* honey, *Moringa* honey also contains flavonoids which act as antioxidants. From the test results, the antioxidant content of *Moringa* honey is 130.60 ppm

with a flavonoid content of 0.028 ppm. The ability of flavonoids as antioxidants can reduce oxidative stress and reduce the reactive oxygen species which cause a protective effect against pancreatic beta cells and increase insulin sensitivity [20]. Besides flavonoids also have the ability to inhibit GLUT 2 in intestinal a mucosa so that it can reduce glucose absorption, resulting in a reduction in the absorption of glucose and fructose from the intestine so that blood glucose levels fall [21].

In addition to flavonoids, other content of *Moringa* honey which acts as an antioxidant is polyphenols, the test results of polyphenol content in *Moringa* honey by 0.13%, in honey plus *Moringa* by 0.02%. Some previous researchers prove that the antioxidants of green tea polyphenols can reduce oxidative stress by preventing a chain reaction of converting superoxide to hydrogen superoxide by donating hydrogen atoms from the aromatic hydroxyl (-OH) polyphenol group to bind free radicals and remove them from the body through the excretion system [22], [23]. The role of polyphenols as antioxidants is thought to protect pancreatic β cells from the toxic effects of free radicals produced under chronic hyperglycemia. According to Kaneto [24], administration of antioxidants can increase pancreatic β cell mass and maintain insulin content in it.

In cells that have insulin receptors (muscle cells, adipose cells, and liver cells), binding of free radicals will increase insulin signaling in intracellular GLUT 4 translocation to cell membranes so that it can take glucose from the blood. In general, a decrease in oxidative stress can reduce insulin resistance and inhibits pancreatic β cell damage. Thus, the polyphenols in *Moringa* honey are indicated to be able to withstand the risk of disease increasing blood glucose levels in pregnant mice [24], [25], [26].

As with the effect of weight gain, a decrease in blood glucose levels in pregnant Wistar rats is also thought to be strong due to the effects of *Moringa* leaves which in the *Moringa* test contain Vitamins A, C, and E, flavonoids polyphenols which act as powerful antioxidants [27]. Polyphenol antioxidant content as already explained that polyphenol antioxidants by donating hydrogen atoms from the aromatic hydroxyl group (-OH) polyphenols to bind to free radicals and remove them from the body through the excretion system [22], [23].

Recommendation

All study groups experienced a significant decrease in GD but the decrease did not differ significantly. However, the decrease in GD in the intervention group of *Moringa* honey is better than in other groups, this is due to the nutritional content of *Moringa* honey in the form of polyphenols, flavonoids, and Vitamin C which acts as an antioxidant as well as the main energy content in *Moringa* honey which is dominated by more fructose easily metabolized in the body so that it can reduce GD. *Moringa* honey in the future so that it can be used as a supplement for pregnant women to control GD levels in pregnant women.

Conclusion

It shows that honey variation has the effect of controlling blood glucose levels during pregnancy.

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The Effect of *Moringa oleifera* to Hemoglobin Levels of Preconception Women in the Health Center Tibawa District Tibawa, Gorontalo

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Abstract

BACKGROUND: The maternal mortality rate (MMR) in Gorontalo Province is still high at 194.7/100,000 live births. Causes of high MMR include bleeding and anemia.

AIM: This study aimed to assess the effect of giving *Moringa oleifera* extract on the hemoglobin concentration of preconception women in the area of the health center Tibawa.

METHODS: This research method was a true experiment with a type of randomized controlled double-blind intervention of WUS aged 15–35 years with a sample of 44 people selected using purposive sampling techniques collected by trained personnel, including general data of respondents.

RESULTS: The results showed nutritional status and hemoglobin concentration in the treatment group of 12 people (54%) with an increase in Hb 0.1–1.0 g/dl and ten people (45%) with an increase in Hb 1.5–2.0 g/dl after the intervention, whereas in the control group of five people (22%) with an increase in Hb 0.1–1.0 g/dl and 17 people (77%), there was no increase in Hb after the intervention. There was a significant difference in hemoglobin concentration in the treatment group with $p = 0.000$ ($p < 0.05$) with an average increase of 1.54. There was a significant difference in hemoglobin concentration in controls with $p = 0.025$ ($p < 0.05$) with an average increase of 0.22.

CONCLUSION: There is a difference in the effect between administration of *M. oleifera* extract that is more effective on hemoglobin concentration compared to MMN. It is hoped that in supporting government programs in reducing anemia in women of childbearing age, *M. oleifera* extract can be an alternative to giving blood-added tablets MMN.

Introduction

The World Health Organization targets a 50% reduction in the prevalence of anemia in WUS by 2025. Riskesdas 2013 data show the prevalence of anemia in WUS aged >15 years by 22.7%, while for pregnant women by 37.1%. Based on the results of Riskesdas in 2018, it showed that the proportion of anemia of pregnant women had increased to 48.9% from 37.1% and mostly occurred in pregnant women with group 15–24 years with a percentage of anemia in pregnant women in the Puskesmas area. This is an increase from 2017, which is 8.3% [1].

Adolescent fertilization is an important issue in terms of health and social because it is related to the level of morbidity and mortality of mother and children. Mothers who are teenagers, especially <18 years, are more likely to experience problems in their babies or even experience childbirth related deaths compared to older women. SKDI 2012 results show that 10% of adolescents have become mothers, 7% had given birth, and 3% were pregnant with their first child [2].

The situation of public health status in Gorontalo Province in 2014 can be seen from the achievement of the maternal mortality rate (MMR) which still high at 194.7/100,000 live birth. This number is declining compared to 2013, which reached 251.7/100,000 KLH. For the Tibawa health center area in 2018, the percentage of anemia in pregnant women was 10% (38 people), the number of pregnant women in the health center area. This was an increase from 2017, which was 8.3%.

The first 1000 days of life, which starts from the time of conception until the child is 2 years old, which is the most critical period to improve the child's physical and cognitive development. The nutritional status of women before conception can affect the critical development process during pregnancy and child born. In addition, women who intend to become pregnant are more vulnerable to suggestions for lifestyle changes [3].

Reproductive planning is very important in ensuring good outcomes for women and their offspring in the future. Sufficient micronutrient intake beforehand during the preconception period will provide additional benefits for malnourished girls and adult women as well as in cases of an unplanned pregnancy. Folic acid,

vitamin B, and zinc have been shown to affect fetal development early in life, even before women realize that they are pregnant [4]. Preconception micronutrient interventions may be a promising approach to reducing iron deficiency during pregnancy [4], [5].

Research conducted by Young *et al*. [6] shows that the nutritional status of mother during preconception such as height and weight influences the nutritional status of children until 2 years of age. Mother <150 cm in height and weight <43 kg/m^2 increases the risk of stunting in children until 2 years (IRR incident risk ratio, respectively, 1.85, 95% CI 1.51–2.28 and IRR 1.35.95% CI 110–1.65), BMI cut-offs (<17/m^2 or 18.0 kg/m^2) 1.3 timer can increase the risk of stunting in children. Every 1 SD increase the risk of stunting in an increase in maternal weight and height can increase 0.30 SD and 0.23 SD in the fetus until 2 years of age.

A study conducted by Amalia showed that there are still preconceptions women who are not compliant in taking MMN. Non-compliance with drug consumption is influenced by the explanation of the officers about the benefits of MMN [7].

According to research results, *Moringa oleifera* contains Vitamin A, Vitamin C, Vitamin B, calcium, potassium, iron, and protein, in very high amounts that are easily digested and assimilated by the human body. *M. oleifera* is the leaves of Moringa trees that contain a variety of macro and micronutrients as well as active ingredients that are as antioxidants. It contains essential nutrients such as iron (fe) 28.2 mg, calcium (ca) 2003.0 mg and vitamin A 16.3 mg rich in β-carotene, protein, Vitamins A, C, D, E, K, and B (thiamine, riboflavin, niacin, pantothenic acid, biotin, Vitamin B6, Vitamin B12, and folate), various types of antioxidant compounds such as ascorbic acid, flavonoids, phenolics, and carotenoids. Moringa eggs are used as the main ingredient for hundreds of drugs, both for prevention and treatment [8].

Especially for the Gorontalo community, they only use this plant as a fodder and live fence. Lack of socialization about the benefits of Moringa has resulted in the low consumption of Moringa [9].

Materials and Methods

This research was conducted in the area of the Puskesmas Tibawa, Tibawa Subdistrict, Gorontalo Regency. This type of research is a true experimental study with a type of randomized controlled intervention double-blind design.

The population in this study were all preconception women registered in the area of the Puskesmas Tibawa regency aged 15–35 years, who were married and registered in the KUA of the Tibawa District, which were 703 people. There were 22 samples for the treatment group and 22 control groups that met the inclusion criteria, namely, preconception women registered in the KUA of the Tibawa subdistrict aged 15–35 years, who suffer from mild-moderate anemia with hemoglobin levels (<10 g/dl-7 g/dl), willing to receive *M. oleifera* extract capsules, and MMN for 6 weeks, do not consume multivitamins and other minerals during the study and are willing to sign informed consent.

Data collection was carried out by interview using a structured questionnaire to get data on maternal characteristics, namely, data on age, education, income, and pregnancy history, measurement of hemoglobin. Data collection for hemoglobin was carried out twice, namely, before the intervention and after conducted and intervention.

Univariate analysis is used to obtain a description of the frequency distribution of respondent characteristics, including data on age, education, income, and history of pregnancy. Bivariate analysis was used to assess differences in mean before and after treatment in each group with paired t-test, if the data distribution was normal, and the Wilcoxon test if the data distribution was not normal. To see the difference in mean changes between the two groups, the independent t-test was used if the data distribution was normal and the Mann–Whitney U-test if the data were not normal.

Results

Table 1 shows that the majority of respondents in the two groups were vulnerable aged 20–35 years, had the number of children 1 person, occupation as a household RT, and the level education last junior high, the results of statistical tests of differences in the two groups at the beginning of the study showed that both groups were significantly different (p > 0.05), which indicate that the two groups have equality for the variable characteristics of aged, number of children, work and education, and income.

Table 1: Characteristics of respondent

Variables	Intervention group		Control group		P
	n	%	n	%	
Age					
<20 year	6	37.5	10	62.5	0.174
20–35 year	16	57.1	12	42.9	
>35 year	0	0	0	0	
Parity					
0	6	27.3	5	22.7	0.627
1	14	63.6	13	59.1	
2	2	9.09	4	18.2	
Work					
IRT	21	95.5	22	100	
Private	1	4.5	0	0	0.500
Education					
SD	2	9.1	8	36.4	0.19
SMP	10	45.5	11	50.0	
SMA	10	45.5	2	9.09	
PT	0	0	1	4.5	
Income					
<2,500,000	21	95.5	21	95.5	0.579
>2,500,000	1	4.5	1	4.5	

Table 2 shows that in the capsule group intervention before intervention, as many as 18 people

(81.8) had mild anemia, and four people (18.1%) had moderate anemia. Then, after the intervention for 6 weeks, 3 people (13.6%) had normal Hb status, 18 people (81.8%) were mild, and one person (4.5%) had moderate Hb status.

Table 2: Distribution subject according to hemoglobin levels before and after intervention to group intervention to woman preconception in area health center Tibawa 2019

Clasifika status hemoglobin	Hemoglobin levels	Before intervention		After intervention	
		n	%	n	%
Normal	>12 g/dl	0	0	3	13.6
Mild anemia	9–11.9 g/dl	18	81.8	18	81.8
Moderate anemia	7.0–8.9 g/dl	4	18.1	1	4.5
Severe anemia	<7 g/dl	0	0	0	0
Number		22	100	22	100

Table 3 shows that in the group control before intervention, as many as 21 people (95.5%) had mild anemia, and one person (4.5%) had moderate anemia. However, after 6 weeks of intervention, the status of hemoglobin in the group control subjects remained constant, with 21 people (95.5%) having mild anemia and one people (4.5%) having moderate anemia.

Table 3: Distribution subject according to hemoglobin levels before and after the intervention to group control to woman preconception in area health center Tibawa 2019

Clasifikasi status hemoglobin	Hemoglobin levels	Before intervention		After intervention	
		n	%	n	%
Normal	>12 g/dl	0	0	0	0
Mild anemia	9–11.9 g/dl	21	95.5	21	95.5
Anemia moderate	7.0-8.9 g/dl	1	4.5	1	4.5
Severe anemia	<7 g/dl	0	0	0	0

Table 4 shows that the change in hemoglobin Hb concentration in the group intervention was 12 people (54%) with an increase in Hb 0.1–1.0 g/dl and ten people (45%) with an increase in Hb with an increased in Hb 1.5–2.0 g/dl after the intervention, whereas in group control of 5 people (22%) with an increase in Hb 0.1–1.0 g/dl and 17 people (77%), there was no increase in Hb after the intervention.

Table 4: Distribution subject according to hemoglobin levels before and after intervention to group intervention and group control to woman preconception in area health center Tibawa 2019

Change of hemoglobin (g/l)	Before intervention		After intervention	
	n	%	n	%
<0.1	0	0	17	77
0.1–1.0	12	54	5	22
1.0–1.5	0	0	0	0
1.5–2.0	10	45	0	0
Total	22	100	22	100

Table 5 shows that the change in hemoglobin Hb concentration group intervention was 12 people (54%) with an increase in Hb 0.1–1.0 g/dl and ten people (45%) with an increase in Hb 1.5–2.0 g/dl after the intervention, whereas in group control of 5 people (22%) with an increase in Hb 0.1–1.0 g/dl and 17 people (77%), there was no increase in Hb after intervention.

Table 5: Analysis subject according to hemoglobin levels before and after intervention to group intervention and group control to woman preconception in area health center Tibawa 2019

Group	n	Hemoglobin (g/dl)		Δ Mean	p*
		Pre-test	Post-test		
		Mean ± SD	Mean ± SD		
Group intervention	22	9.05 ± 1.046	10.59 ± 1.054	1.54	0.000
Group control	22	9.55 ± 0.912	9.77 ± 0.973	0.22	0.025
p**		0.043	0.005		

*Wilcoxon signed-ranks test. **Mann–Whitney U-test.

Discussion

A mother age is related to women reproductive organs. In this study, the majority (63.6%) of respondents were vulnerable aged 20–35 years, and the rest (36%) aged <20 years. This study is in accordance with research conducted by Aminingsih and Putra [10] that most of the age group of respondents (50.1%) are vulnerable aged 20–35 years. It is considered that the majority of respondents already have a safe reproductive system for pregnancy preparation and also have a connection with the mental readiness of the mother to be able to accept the process of pregnancy.

Education is developing all abilities and human behavior through knowledge. In this study, the majority of respondents (47.7%) had a junior high school level, and only (2.7%) had the highest level of education, namely, S1. This greatly affects the level of acceptance of respondents aim absorbing knowledge related to health, especially anemia. The higher the mother's nutritional knowledge was, the higher the awareness to participate in the provision of food so that anemia is fulfilled, the Hb levels will increase where there is a tendency for each additional 1% of knowledge, the Hb levels will increase by 0.006 g/dl [11].

Income is the real amount of income of all household members who are donated to meet the needs of both people and individuals in the household. In this study, most of the respondents 42 people (95.5%) have income levels <2,500,000/month and only 2 people (5%) have income >2,500,000/month. The low level of income in the household will affect the purchasing power of foodstuffs that contain nutrients.

Parity is the number of children born to a mother whether born or stillborn. This study showed that the majority of respondents, 27 people (61.4%) had one child, and 11 people (25%) did not have children. However, this respondent had planned for her pregnancy several years in advance. Parity is one of the factors that are assumed to have a relationship with the incidence of anemia in pregnant women. According to the recommendations issued by the BBKBN, the ideal pregnancy distance is 2 years or more because a short birth interval will cause that a mother is not enough to restore the condition of her body after giving birth before. Short pregnancy intervals tend to deplete maternal nutrition from pregnancy and blood loss during childbirth [2].

Maternal nutrition and health status during pre-pregnancy are very important, while breastfeeding is a very critical period for the growth and development of children. In this study, as many as six people (13.6%) experienced KEK, and this was related to the risks that would be faced by expectant mothers and babies who would later be born. In this study, six people (13.6%) respondents experienced KEK. The occurrence of

KEK is influenced by several factors, both directly and indirectly. Family economic factors greatly affect the availability of food containing fe in the household. This can be seen from the total family income in the two treatment groups having an average income of <Rp. 2,500,000 by 42 people (95.4%) and only two people (4.5%) who have an income of >Rp. 2,500,000. This lack of income indirectly affects food intake, especially for expectant mothers. The amount of income spent on food can be used as a guideline for the level of household well-being and affect the power of Brli and the choice of food to be consumed [12], [13], [14].

M. oleifera is one type of tropical plant that is easy to grow in Indonesia. The high iron content of *M. oleifera* leaves is thought to be efficacious to overcome iron deficiency anemia by increasing the number of red blood cells so that it can increase blood viscosity and peripheral resistance of blood vessels that affect blood pressure. This study showed that there were significant differences in hemoglobin concentration in the group intervention with p = 0.000 (p < 0.05). The results of Hb concentration measurements showed that there was an increase in Hb concentration in the group intervention which was 9.05 ± 1.046 (Mean± SD) at the initial measurement to 10.59 ± 1.054 at the end of the measurement, with an average increase of 1.54. Hence, it can be assumed that Moringa leaf extract is very influential in increasing the concentration of preconception female hemoglobin.

One effort that has been made by the government is to support the 1000 HPK Movement, especially in overcoming anemia in WUS through the administration of MMN in the form of iron (60 mg $FeSO_4$) and folic acid (0.25 mg). This research shows that there is a significant difference in hemoglobin concentration in group control which had increased from 9.55 ± 0.912 (Mean ± SD) to 9.77 ± 0.973 (Mean ± SD) at the end of the measurement with an average increase of 0.22. Average Hb levels both before and after were significantly different (p < 0.05). Hence, it can be assumed that the intervention of MMN influences the increase in the concentration of preconception female hemoglobin, although the effect on hemoglobin is very different from the group intervention. Hence, that group intervention can be used as an alternative in increasing hemoglobin in preconception women.

Conclusion

There was a significant difference in hemoglobin concentration in the group given Moringa capsules by p = 0.000 (p < 0.05). *M. oleifera* extract has a more significant effect on the subject's hemoglobin concentration compared to MMN so that *M. oleifera* extract can be used as an alternative other than MMN. As for suggestions from this research in supporting government programs in reducing anemia in women of childbearing age, Moringa leaf extract can be an alternative to giving MMN.

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Effect of the Stems Lemongrass (*Cymbopogon citratus*) in Pallumara and Pepes Anchovy (Stolephorus Sp.) to Uric Acid Levels of Hyperuricemia Elderly Women

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Abstract

BACKGROUND: Compliance with food-base dietary guidelines has been known delivered positive effect on nutrition and public health.

AIM: The aim of the study was to assess the effect of lemongrass stems in pallumara and anchovy pepes on changes in uric acid levels in elderly women in hyperuricemia.

METHODS: This research is a quasi-randomized pre-test-post-test control group design experiment. The study sample was elderly women with hyperuricemia who met the inclusion and exclusion criteria of 45 persons divided into two intervention groups and one control group. The first group was given lemongrass stems in pallumara anchovy, the second group was given lemongrass stems in anchovy pepes, and the control group only consumed family food. Data were analyzed using paired t test, one-way ANOVA, Chi-square, and Kruskal–Wallis.

RESULTS: The results showed that a significant change in uric acid levels in both intervention groups ($p = 0.001 < 0.05$), whereas the control group was not significant. There was a difference in changes in uric acid levels between the intervention group and the control group ($p = 0.000 < 0.05$).

CONCLUSION: It was concluded that the large difference in uric acid levels between the intervention group and the control group was 26.5% and 28.3%. It is recommended to use lemongrass in preventing elevated blood uric acid levels.

Introduction

The rate of development of the world's population, including Indonesia, is now heading toward an aging process, marked by an increasing number and proportion of elderly populations (residents aged 60 years and over) that have exceeded 7% [1]. Indonesia is among the top five countries with the largest number of elderly people in the world. The 2016 Susenas results showed an increase in the number of elderly people reaching 22.4 million people or 8.69% of the total population, while in 2018 the percentage of elderly people reached 9.27% or around 24.49 million people [2].

Various problems arise in line with the aging process, such as physical, psychological, social, economic, cultural, and health problems that can cause the condition of the elderly to be vulnerable to an illness. Hyperuricemia is an increase in uric acid levels above normal, in men above 7 mg/dl and in women above 6 mg/dl. The average level of uric acid in the blood depends on age and sex [3]. The prevalence of hyperuricemia continues to increase. In Taiwan the prevalence of hyperuricemia is 30.4%, in men (30.2%), and women (30.6%). This prevalence will increase significantly with age [4].

In Indonesia according to the World Health Organization in 2013, the prevalence of hyperuricemia was 81% [4]. While a study in North Halmahera also showed that the prevalence of hyperuricemia was high, namely, 60% (men 50.83% and women 69.17%) [5].

Risk factors associated with hyperuricemia include sex and increasing age, hypertension, obesity, smoking and increased serum triglycerides, type 2 diabetes, and alcohol consumption, hyperuricemia plays an important role in the occurrence of cardiovascular morbidity in the general population, hypertension, and type 2 diabetes mellitus [6], [7], [8].

Lemongrass (*Cymbopogon citratus* Stapf.) is a type of grass plant that contains 1–2% essential oils containing various active chemicals that are biologically functioning therapeutically [9], [10]. Lemongrass launched has antibacterial, antifungal properties. antiprotozoal, anti-carcinogenic, anti-inflammatory, antioxidant, cardioprotective, antitussive, antiseptic, and anti-rheumatic activity [11].

The antioxidant activity of lemongrass was analyzed by DPPH scavenging test and the highest inhibition was obtained with essential oils extracted from lemongrass stems (89.5%). The anti-gout test was examined through the xanthine oxidase inhibition (XOI) test with a maximum percentage of xanthine oxi XOI 81.34% obtained from essential oils on the lemongrass stalk [9], [12]. Pelleng research [13] showed a decrease in blood uric acid levels in male white Wistar rats fed with lemongrass herbal steeping.

Pallumara fish and Pepes fish are types of dishes that are favored by the community. Anchovy is a type of high-quality fish, contains a lot of protein and calcium, is very easy to obtain in the market, with a relatively cheap selling power [14]. Jeneponto Regency is one of the regencies in South Sulawesi Province that is currently still a disadvantaged region where the number of elderly people in this Regency continues to increase. In 2014, the number of the elderly was 8.78%, in 2016, it increased to 9.12% and, in 2017, it became 9.32%. In this region, we have encountered a lot of lemongrass plants, both in the garden land and in the yard of the house. Likewise, anchovies are easily obtained and become one of the types of fish that are widely consumed by Jeneponto residents.

Barana Health Center is one of the remote health centers in Jeneponto District where hyperuricemia cases were found to show an increase from 71 cases in 2017 to 122 in 2018. This study aims to assess the effect of lemongrass stems in anchovy anchovies and anchovy pepes on changes in uric acid levels in elderly women suffering from hyperuricemia.

Materials and Methods

This research was conducted in the working area of Barana Health Center, West Bangkala District, Jeneponto Regency, South Sulawesi. This type of research is a non-randomized pre-test-post-test control group design experiment.

The study population was all elderly women who suffer from hyperuricemia in the work area of Barks Puskesmas, Bangkala Barat District, and Jeneponto Regency. Samples amounted to 45 people who met the inclusion and exclusion criteria divided into three groups: Fifteen people in the intervention group who were given lemongrass stems in pallumara anchovy cooking, 15 people in the intervention group who were given lemongrass stems in anchovies pepes, and 15 people in the control group.

Characteristic data (age, disease history, occupation, and BMI) were obtained directly from respondents using questionnaire sheets and taking anthropometric measurements, while intake data (energy, protein, and purines) were obtained using food record sheets. Data of uric acid levels pre- and post-test were obtained from the Prodia Makassar laboratory.

Food intake data were processed using Nutraclin software, while other determinant factor data (characteristic data and changes in uric acid levels) were processed using SPSS for windows 21.

To compare the results of examination of blood uric acid levels before and after the intervention, the paired t-test was used. For categorical scale characteristics data were analyzed using the Chi-square test. To compare the difference in changes in uric acid levels between groups, the one-way ANOVA test was used, and to find out which pair experienced different changes, further test analysis was performed using the *post hoc* Bonferroni test.

Results

Table 1 shows that the majority of respondents in each group were aged 60–69 years with a percentage of 86.7% in the lemongrass intervention group in anchovy pallumara cooking, 53.3% in the lemongrass intervention group in anchovy pepes cooking, and 66.7% in the control group.

Based on the history of the disease, Table 1 shows that the majority of respondents suffer from hypertension, in the lemongrass stem intervention group in pallumara anchovy cooking by 53.3%, the lemongrass intervention group in anchovies pepper cooking by 80%, and the control group in 46.7%.

Table 1 also shows that in the occupational variable, it is known that respondents generally work as farmers, 60% in the first intervention group, 80% in the second intervention group, and in the control group 46.7%. In the IMT variable, it can be seen that the majority of respondents are in the normal category, in the lemongrass stem intervention group in pallumara anchovy cooking by 53.3%, the lemongrass intervention group in anchovy pepes cuisine 60%, and the control group by 66.7%.

The uric acid levels in the pre-test in Table 1 showed that the mean uric acid levels of respondents in the lemongrass intervention group in anchovy pallumara cooking was 6.68 ± 0.32, the lemongrass intervention group in anchovy pepes 6.67 ± 0.33, and in the group control 6.92 ± 0.50. Statistical test results in Table 1 showed that there were no significant differences in all of the respondent's characteristic variables ($p > 0.05$), this meant that all the characteristics that were sampled as research samples were homogeneous. In other words, the results of the study are not the influence of the characteristics of the study sample.

Table 2 shows that the level of energy sufficiency in the lemongrass stem intervention group

in pallumara anchovy cooking (90.47%) and the lemongrass stem intervention group in anchovy pepes cooking (90.08%) was classified as good, while the control group was low (89.78%).

The level of protein adequacy in Table 2 shows, lemongrass stem intervention group in pallumara anchovy cooking 100.97%, lemongrass stem intervention group in anchovy pepes cooking 100.54%, and 98.78% control group, all groups were classified as good.

Likewise, with the adequacy level of purines, lemongrass stem intervention group in pallumara anchovy cooking is 116.36%, lemongrass stem intervention group in anchovy pepes cooking 111.12%, and control group 114.36%.

Through the Kruskal–Wallis test in Table 2 is known that the level of energy, protein, and purine adequacy did not differ significantly between the lemongrass intervention groups in pallumara anchovy cooking, lemongrass intervention groups in anchovy pepes cooking, and the control group with $p > 0.05$.

Table 3 shows in the group given lemongrass stems in anchovy pallumara cooking, a decrease in uric acid levels with an average decrease of 0.95 mg/dl or 31.6%, whereas in the group given lemongrass stems in anchovy pepes, there was a decrease in uric acid levels with an average decrease of 1.06 mg/dl (33.4%).

Statistical test results in Table 3 showed that the decrease in uric acid levels in both intervention groups was a significant change with a value of $p = 0.001 < 0.05$, in the control group found an increase in uric acid levels of 0.12 mg/dl (5.13%) and the change was not statistically significant ($p = 0.582 > 0.05$).

Then, the results of the analysis of the comparison of the differences in uric acid levels in each group in Table 3, where the uric acid levels in the pre-test did not differ significantly, on the contrary in the post-test the uric acid level was significantly different. For comparison of the large differences in changes in uric acid levels in each group was analyzed using the one-way ANOVA test which showed a significant difference ($p = 0.000 < 0.05$).

Further test analysis in Table 3 showed that the different groups were the groups that were given lemongrass stems in pallumara anchovy cooking with the control group ($p = 0.001 < 0.05$) with a large comparison percentage of change of 26.5% and between groups that were given lemongrass stems in pepes cooking anchovies with a control group ($p = 0.001 < 0.05$), with a large percentage change in change of 28.3%, while for the two intervention groups, the results of statistical tests showed no significant differences.

Based on the analysis results in Table 3, it can be said that there is an effect of providing lemongrass stems in pallumara anchovy and anchovy pepes cooking on changes in uric acid levels.

Table 1: Characteristics of research respondents

Characteristics of research respondents	Stems lemonggrass+Pallumara anchovy		Stems lemonggrass+Paepes anchovy		Control		p value
	n	%	n	%	n	%	
Age							0.391[a]
60–69 (years old)	13	86.7	8	53.3	10	66.7	
70–79 (years old)	2	13.3	7	46.7	5	33.3	
Disease history							0.570[b]
DM	4	26.7	0	0	5	33.3	
Hypertension	8	53.3	12	80	7	46.7	
There is no	3	20.0	3	20	3	20.0	
Work							0.808[b]
Housewife	5	33.3	3	20	7	46.7	
Farmers	9	60.0	12	80	7	46.7	
Trader	1	6.7	0	0	1	6.7	
BMI							0.515[b]
Stunting	3	20,0	3	20.0	2	13.3	
Normal	8	53.3	9	60.0	10	66.7	
Overweight	4	26.7	3	20.0	3	20.0	
Uric acid level							0.148[a]
Mean ± SD	6.68 ± 0.32		6.67 ± 0.33		6.92 ± 0.50		
Minimum–Maximum	6.2–7.1		6.1–7.2		6.2–8.1		

[a]One-way ANOVA test; [b]Chi-square; *P*<0.05.

Table 2: Energy, protein, and purine adequacy levels during the intervention

Intake	Mean ± SD						p value
	Stems lemonggrass+Pallumara anchovy		Stems lemonggrass+Paepes anchovy		Control		
	Mean intake	%	Mean intake	%	Mean intake	%	
Energy (cal)	1526.4 ± 148.98	90.47 ± 5.23	1445.5 ± 118.70	90.08 ± 3.52	1452.2 ± 126.58	89.78 ± 3.69	0.92*
Protein (g)	42.53 ± 3.12	100.97 ± 5.51	40.28 ± 3.21	100.54 ± 6.62	39.95 ± 3.83	98.78 ± 5.82	0.35*
Purine (mg)	202.33 ± 18.31	116.36 ± 10.53	193.25 ± 12.57	111.12 ± 7.22	198.89 ± 17.82	114.36 ± 10.26	0.35*

*Kruskal–Wallis; P<0.05.

Table 3: Changes in uric acid levels

Group	n	Mean ± SD Uric acid level (mg/dl)		p	%	Different couple	% Different couple
		Pre	Post				
Stems lemonggrass+Pallumara anchovy	15	6.68 ± 0.32	5.73 ± 0.86	0.001*	31.6	1.000[a,b]	1.8[a,b]
Stems lemonggrass+Paepes anchovy	15	6.67 ± 0.33	5.61 ± 0.84	0.001*	33.4	0.001[a,c]	26.5[a,c]
Control	15	6.93 ± 0.50	7.05 ± 0.92	0.582*	5.13	0.001[b,c]	28.3[b,c]
p value		0.210**	0.000**				0.837[a,b]***

*Paired t-test; **One-way ANOVA; Different couple *post hoc* test – Bonferroni. ***t independent; *P*<0.05. Source: Primary data, 2019.

Discussion

The statistical test results in this study show that the decrease in uric acid levels after the intervention is not the influence of the respondent's characteristic variables.

One of the risk factors for hyperuricemia is age and sex in which various research results indicate that the age range that is usually at risk of developing gout is 30–50 years in men, whereas in women it increases after entering menopause. This is consistent with the results of research showing that the incidence of gout arthritis is more experienced by women as much as 45.2% (42 people) because the majority of the age of respondents in this study is >50 years [15].

Obesity and body mass index contribute significantly to the risk of gouty arthritis where the risk is very low for men with a body mass index between 21 and 22 but is tripled for men who have a body mass index of 35 or greater [16]. Diabetes mellitus will lead to insulin resistance; as a result glucose will accumulate in the bloodstream and disrupt blood circulation, which will make the kidneys work more slowly and inefficiently when releasing waste or uric acid into the urine so that the kidney is difficult to remove excess uric acid from the body [15].

The relationship between gout and hypertension has been described since the early 1960s. It was found that hyperuricemia, in some populations, stimulates the onset of hypertension through the formation of an inflammatory cascade, in which endothelial dysfunction occurs, smooth muscle proliferation, and renal afferent artery arteriosclerosis. In addition, hypertension is a comorbid gout which affects more than 74% of patients with gouty arthritis [17].

Protein especially derived from animals can increase uric acid levels in the blood. Food sources contain animal protein in high amounts such as liver, kidney, brain, and spleen. Recommended protein intake is 50–70 g/day or 0.8–1 g/kg body weight/day. The recommended source of protein is vegetable protein derived from milk, cheese, and eggs [17].

High protein diets usually contribute to an increase in purine intake which is associated with hyperuricemia. Based on the description of the adequacy of purine intake, subjects consume purines <400 mg/day, so the daily purine consumption of most subjects tends to be low [18].

The results of this study are similar to the results of Hastuti *et al*. [18] which showed that there was no relationship between total protein intake and uric acid levels ($p \geq 0.05$). This shows that the decrease in uric acid levels in the intervention group was not influenced by protein and purine intake. In this study, the results of analysis of changes in uric acid levels after the intervention showed that there was an effect of lemongrass stems in pallumara anchovy and anchovy pepes cooking on changes in uric acid levels.

The results of this study are in line with the results of a study that showed that lemongrass can reduce uric acid levels. Increasing the dose of lemongrass is also directly proportional to the decrease in uric acid levels, which means that the more doses used, the active substances contained in lemongrass will be more effective in reducing uric acid levels [13]. Lemongrass (*C. citratus*) is a plant commonly used as a spice by people in Indonesia, in tropical countries, especially in Southeast Asia [11]. This plant contains 1–2% of the dried essential oil with a very wide variation in chemical composition [9]. The oil is a yellow liquid containing about 75–85% of aldehydes [11].

Boukhatem *et al*. [19] revealed 23 compounds from essential oils of lemon grass whereas in other studies showed the chemical composition of essential oils from searai stems consisting of 68 compounds, while the chemical composition of essential oils from lemongrass leaves consisted of 72 compounds. GCMS analysis results are geranial (32.10% and 29.64%), Neral (22.36% and 21.73%), geraniol (5.40% and 7.75%), limonene (5.71% and 5.92%), and β-myrcene (2.20% and 2.28%), where the essential oil content of lemongrass stems is 67.77% and in lemongrass leaves is 67.33% [12], [20].

In addition, *C. citratus* is also reported to contain flavonoids and phenolic compounds, which consist of luteolin, isoorientin 2'-O-rhamnoside, quercetin, kaempferol, and apigenin [11], [21]. It contains alkaloids, saponins, tannins, anthraquinones, steroids, and phenols. Wherein, the ethanol extract of lemongrass contains 535.44–1007.35 mg/100 g phenolic total and has antioxidant activity of 80.38–93.31% [22].

Various studies have been conducted regarding the antioxidant activity of lemongrass, a study showed that infusions and decoctions made from lemongrass showed antioxidant properties by cleaning superoxide anions, inhibiting lipoperoxidation, and DPPH decolorization. This effect is higher in infusion than stew [23] likewise, lemongrass infusion showed stronger antioxidant activity in relation to other extracts (methanol, 80% ethanol, and water stew) [23].

The antioxidant activity of lemongrass analyzed by DPPH scavenging test showed that the highest inhibition was obtained with essential oils extracted from lemongrass stems (89.5%), and the anti-gout test was examined through the XOI test with a maximum percentage of xanthine oxi XOI 81.34% obtained from essential oils in the lemongrass stalk [9], [12].

These results are in line with the results of research by Anggraeni *et al*. [24] which shows that essential oils extracted from lemongrass stems have antioxidant activity with inhibition of up to 809 ppm at a ratio of 1:2 for the concentration of volatile oil volume per volume of solvent. Similar research also

shows that the β myrcene content in lemongrass has antigout properties [23] and kaempferol compounds are anti-inflammatory [25], it was also reported that the inhibitory activity of essential oils will decrease when the concentration of essential oils decreases [26].

Xanthine oxidase is a source of oxygen free radicals. In the reperfusion phase (i.e., reoxygenation), xanthine oxidase reacts with oxygen molecules, and releasing superoxide free radicals. Two types of flavonoids, quercetin and silibin, can inhibit the activity of xanthine oxidase, resulting in decreased oxidative injury [27]. Flavonoids are secondary metabolites that have potential as XOI and have similar structures with xanthine. This is due to the presence of two aromatic rings that have hydroxyl groups as electron acceptors of the xanthine oxidase enzyme [28].

The structure of flavonoids generally consists of three benzene rings. Where the C atom in the structure has a double bond, so it easily binds to the xanthine oxidase enzyme which causes that the formation of xanthine is reduced and the production of uric acid is reduced [29]. Flavonoids inhibit xanthine oxidase enzyme activity through interactions with enzymes in side groups and competitive inhibition mechanisms. With the increase of XOI, it shows that the production of uric acid will be lower so that this condition will reduce the risk of developing gout [30], [31], [32]. Thus, citronella essential oil has high potential to be an alternative source of antigout medication because it contains a potential compound of XOI [12].

Recommendation

It is recommended to use lemongrass in preventing elevated blood uric acid levels.

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The Effect of Socioeconomy on Chronic Energy Deficiency among Pregnant Women in the Sudiang Raya Health Center, 2019

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Abstract

BACKGROUND: Chronic energy deficiency (CED) is a condition of malnutrition of pregnant women which have an advanced impact in the form of health problems and complications in the mother and baby. For this reason, it is necessary to work toward prevention by knowing the socioeconomic influence on CED.

AIM: The aim of the study was to determine the effect of socioeconomics on the incidence of CED in pregnant women.

METHODS: This research is observational analytic with case–control research design. A sample of 99 pregnant women was taken from the working area of the Sudiang Raya Health Center. This sample consisted of 33 case groups of mothers with CED and 66 control groups of pregnant women who did not suffer from CED who had met the inclusion and exclusion criteria of the study. Data were analyzed using analysis Chi-square and multiple logistic regression.

RESULTS: The results showed that maternal occupation (p = 0.018; odds ratio [OR] = 6.091; confidence interval [CI] 95% 1.367–27.133) was significant for CED, whereas that education (p = 0.213; OR = 0.593; CI 95% 0.260–1.351) and income (p = 0.576; OR = 0.733; 95% CI 0.247–2.179) are not significant to CED. Based on multivariate analysis we found that the most influential factor was occupation (adjusted OR = 11.734, CI 95% 1.253–109.91).

CONCLUSION: Based on the results of research and discussion, it can be concluded that work affects the CED in pregnant women, while maternal education and income have no effect on CED in pregnant women. Occupation is the most influential factor on the CED, women who do not work have a risk of 11.734 times experiencing CED compared to women who work.

Introduction

Globally, malnutrition is an important health problem, especially in children under five and pregnant women. The World Health Organization (WHO) classifies malnutrition as the biggest threat to public health. Chronic energy deficiency (CED) is one of the conditions of malnutrition, a state of fertile age women (WUS) suffering from chronic food shortages (chronic), which results in relative or absolute health problems arising from one or more nutrients [1].

The proportion of pregnant women with chronic energy deficiency based on Basic Health Research in 2013 was 38.5% and experienced a significant decrease in 2018 to 17.3%. In South Sulawesi Province, chronic energy deficiency cases experienced an upward trend in 2017, reported 15.9% of cases, and increased in 2018 to 16.9% [2]. While in Makassar City in 2017, there were 8.43% of pregnant women chronic energy deficiency and experiencing a significant increase in 2018, the proportion of pregnant women chronic energy deficiency is 11.44%. Of the 47 health center in Makassar City, the highest health center in the proportion of chronic energy deficiency, namely, Sudiang Raya in 2017, there were 7.52% cases, and in 2018, there were 16.12% [2].

The main determinants of nutritional status are economic status as indicators of access to adequate family food, use of health services, availability of water sources, and sanitation facilities [3]. Several studies have shown that chronic energy deficiency is influenced by factors, including age, knowledge, genetics, obstetrics, diet, food intake, illness, physical and socio-economic activities, including education, employment, and income. Based on the description, that the cause of chronic energy deficiency in pregnant women is not just a single factor, but there are several influences; therefore, this study aims to find out more about the socio-economic effect on chronic energy deficiency in pregnant women at the Sudiang Raya Public Health Center.

Materials and Methods

The research was performed using quantitative methods, design analytic observational with a approach

case–control with matching the distance of pregnancy in the control group and a distance of <2 years and >2 years. The factors, in this study (education, employment, and income), are independent variables, while the CED events are the dependent variable. The study was conducted from September to October 2019 in the working area of the Sudiang Raya Health Center in Makassar City.

The population in this study were all pregnant women giving birth in the working area of Sudiang Raya Health Center, Makassar City, in 2018. The sample in this study consisted of 99 respondents in the case group is pregnant women who experienced chronic energy deficiency and the control group is pregnant women who did not experience chronic energy deficiency, with a case: control sample ratio of 1:2, so the minimum sample size was 33: 66.

This study uses primary data that are directly taken or obtained by researchers from respondents using a questionnaire (list of questions). The data contain the respondent's identity, age, pregnancy distance, education, employment, and income.

The data analysis technique of this study used univariate, bivariate analysis with test Chi-square, and multivariate analysis with multiple logistic regression with SPSS 21.0 for windows program.

Results

Table 1 shows the characteristics of respondents. The majority of reproductive age (20–35 years) are 90.9% and are the age range recommended by the WHO for safe and good age for pregnant women, while in risk groups (<20 years and >35 years), that is, 9.1%. Pregnancy distance, pregnant women with a risk pregnancy distance of <2 years (<2 years) is 24.2%, and the pregnancy interval are more than 2 years (≥2 years) of 75.8%. Education, mothers with low education (elementary and junior high) in the case and control, had the same proportion, amounting to 33.3%. Likewise, mothers with higher education (high school and university) in cases and controls had the same proportion of 66.7%. Occupation, the average pregnant woman, does not work in cases of 97.0% greater than the control (78.8%). Revenue <2,860,382 (UMK Makassar city) in the case amounted to 72.7% greater than the control (63.6%).

Table 2 shows that the results of an analysis of the effect of education on chronic energy deficiency show a p = 1.000 with an odds ratio (OR) = 1.000; 95% confidence interval (CI) 0.412–2.426 that education is not significant which means that there is no influence of education on chronic energy deficiency. Analysis of the effect of work on chronic energy deficiency shows the p = 0.017 with OR = 8.615; 95% CI 1.081–68.686 that work is significant which means that there is an effect of work on chronic energy deficiency. Pregnant women who do not work at risk 8.615 times experience chronic energy deficiency compared to pregnant women who work.

Table 1: Distribution of respondent characteristics based on pregnancy in the work area of Sudiang Raya Health Center in 2019

Variable	Case		Control		Total	
	n	%	n	%	n	%
Age during pregnancy						
Age<20th and>35th	3	9.1	12	18.2	15	15.2
Age 20–35 Th	30	90.9	54	81.8	84	84.8
Distance of pregnancy						
<2 Years	8	24.2	16	24.2	24	24.2
≥2 Years	25	75.8	50	75.8	75	75.8
Education						
Low	11	33.3	22	33.3	33	33.3
High	22	66.7	44	66.7	66	66.7
Work						
Not working	32	97.0	52	78.8	84	84.8
Working	1	3.0	14	21.2	15	15.2
Income						
<UMK	24	72.7	42	63.6	66	66.7
≥UMK	9	27.3	24	36.4	33	33.3

Table 2 shows that the results of the analysis of the effect of income on chronic energy deficiency show the p = 0.366 with OR = 1.524; 95% CI 0.610–3.807, that income is not significant which means that there is no influence of income on chronic energy deficiency.

Table 2: Bivariate analysis of socio-economic effects on chronic energy deficiency in the work area of Sudiang Raya Health Center in 2019

Variable	Case		Control		Total		p-value	OR	95% CI	
	n	%	n	%	n	%			Lower	Upper
Education										
Low	11	33.3	22	33.3	33	33,3	1.000	1.000	0.412	2.426
High	22	66.7	44	66.7	66	66.7				
Jobs										
Not working	32	97.0	52	78.8	84	84.8	0.017	8.615	1.081	68.686
Working	1	3.0	14	21.2	15	15.2				
Income										
<UMK	24	72.7	42	63.6	66	66,7	0.366	1.524	0.610	3.807
≥UMK	9	27.3	24	36.4	33	33.3				

Table 3 shows the results of the multiple logistic regression analysis by looking at the higher influence values which are looking at the value Wald and the p-value so that the most influential is work after being controlled with education and income variables with a value Wald of 4.654 and a p = 0.031 OR (adjusted OR) = 11.734, CI 95% 1.253–109.918 that pregnant women who do not work are 11.734 times more likely to experience CED compared to working mothers.

Table 3: Logistic regression test results of socio-economic impacts on CED in pregnant women in the work area of Sudiang Raya Health Center in 2019

Variable	B	SE	Wald	Df	p-value	OR	95% CI for Exp.(B)	
							Lower	Upper
Education	−0.284	0.480	0.350	1	0.554	0.753	0.294	1.930
Occupations	2.462	1.14	4.654	1	0.031	11.73	1.253	109.91
Income	−0.257	0.556	0.213	1	0.644	0.774	0.260	2.299
Constant	−204	1.276	0.890	1	0.345	0.300		

Discussion

In this study, there are three variables studied, namely, education, occupation, and income. It can be

seen that from the three variables studied, there is one variable that significantly influences the CED, namely, occupation.

The results of this study indicate that employment is a significant influence factor on CED. This study is in line with research in Metro City, Lampung Province using a design case–control by looking at the effects of demographics and socioeconomics on the incidence of CED with (OR = 17.50), so mothers who do not work 17.50 times have more CED compared to mothers who work [4]. Ernawati [5] regarding the relationship of age and occupational status with the incidence of CED in pregnant women show that there is a relationship between maternal employment status and CED in pregnant women, pregnant women who do not work at risk of experiencing CED by 9.286 times compared to pregnant women who work. The results are similar to Kotut [6] in Kenya that the proportion of unemployed mothers is more likely to experience CED (68%) than working mothers (2%).

Mahirawati research [7] shows that there is a significant relationship between maternal work and the incidence of CED in pregnant women. Someone who works will be more socially interacting in the association so that it can increase knowledge and easily obtain information about health so that it is more selective to meet nutritional needs and choose food to consume.

Work is closely related to economic status, economic status affects the choice of food consumed daily, and working mothers have their own income more easily meet their nutritional needs [1]. Someone with a higher education level tends to choose better food compared to a lower education level. This study shows that maternal education has no effect on the incidence of chronic energy deficiency (CED). The results of the research show that the average respondent has a history of senior secondary education (SMA).

The results of this study are in line with the research of Teguh [8] stating that there is no significant relationship between the level of education and the incidence of CED in pregnant women. Opportunities for CED events in low education are 2.3 times higher than pregnant women with higher education levels in line with the Kotut [6] study conducted in 2014, in which the proportion of mothers with higher education had less CED than mothers with low education. The same results as the research of Ahmad [9] showed that education was not related to the CED occurrence in pregnant women but, in proportion to primary education, more experienced CED than secondary education.

The ability of families to buy food depends on the size of the family income. Families with limited income will most likely not meet the nutritional needs of their bodies. This study shows that income is insignificant with the incidence of chronic energy deficiency, the results of the study indicate that the proportion of mothers with family income above UMK is less likely to experience CED than mothers who have income below UMK.

Marsedi *et al*. [10], in the Sei Jang Health Center in Bukit Bestari District, stated that there is no relationship between family income and the incidence of chronic energy deficiency in pregnant women. In theory, income is a factor that affects the lack of chronic energy, family income determines the quality and quantity of dishes in the family [11], [12]. However, in this study, income is not at risk for CED because in both cases and controls the average monthly income of families <UMK Makassar city.

This study is in line with the study of Wati *et al*. [13] about the relationship of knowledge about nutrition, family income, and soil-transmitted helminths infestation with CED in the Sungai Siak Pekanbaru coastal area that there is no meaningful relationship between income and chronic energy deficiency. Similar to the research by Petrika *et al*. [14] in Sedayu District, Bantul show that there is no significant relationship between the level of income and the risk of chronic energy deficiency in pregnant women. The results of this study are not in line with the study of Daba *et al*. [15] in the East Wollega Zone of Ethiopia showing that income is significant to the nutritional status of mothers (AOR = 5.670 (2.082–15.439). Mothers with low incomes are 5.670 times more at risk of developing CED events compared to mothers with high income.

Recommendation

It is recommended to use lemongrass in preventing elevated blood uric acid levels.

Conclusion

Based on the results of research and discussion, it can be concluded that work affects the CED in pregnant women, while maternal education and income have no effect on CED in pregnant women. Occupation is the most influential factor on the CED, women who do not work have a risk of 11.734 times experiencing CED compared to women who work.

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Dating Behavior and Age at First Time having Premarital Sexual Intercourse on Young Men in Indonesia

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Abstract

BACKGROUND: Adolescence is a period of growth and development that occurs dynamically and rapidly both physically, psychologically, intellectually, socially, and sexual behavior that is associated with the onset of puberty. Health problems in adolescence are one of the important problems in the lifecycle. One of the health problems of adolescents today is sexual conduct before marriage. This behavior is a sexual behavior that is very risky to cause unwanted pregnancy problems, and risks causing various diseases such as sexually transmitted diseases, and even HIV/AIDS.

AIM: The aim of the study was to describe dating behavior and age at first having premarital sexual relations for adolescent boys in Indonesia in 2017.

METHODS: This study uses data from the Indonesian Demographic Health Survey (SDKI) in 2017 with the number of male respondents who are not married aged 15–24 years as many as 12,523 person.

RESULTS: The results showed that more adolescents who are dating are 7047 people (56.3%) compared to those who are dating who are as many as 5476 people (43.7%). The most age at first having sexual relations with young men is at the age of 17 years, namely, as many as 254 people (20.2%), while the age at first having sexual relations with young at least is at the age of 11 years, as many as two people (0.2%).

CONCLUSION: It is suggested to the role of parents, schools, health centers, and health offices in providing information related to comprehensive reproductive health education.

Introduction

Adolescence is a period of growth and development that occurs dynamically and rapidly both physically, psychologically, intellectually, socially, and sexual behavior that is associated with the onset of puberty. The UN mentions young people (youth) for ages 15–24 years. This is then incorporated into the terminology of young people (young people) which covers the ages of 10–24 years. Health problems in adolescence are one of the important problems in the lifecycle. One of the health problems of adolescents today is risky sexual behavior [1].

Based on the WHO data, in some developing countries show about 40% of adolescents aged 18 years have had sex even without marriage. As a result of sexual intercourse, around 12% have been positively affected by sexually transmitted infectious disease; around 27% are HIV positive [2]. Data Center for Disease Control in a study conducted on several high school students in the US in 2011, about 47.4% of students had sexual intercourse (sexual intercourse). Around 33.7% had sexual intercourse in the past 3 months, and 15.3% had sexual relations with four or more people during their lives [3].

Research in sub-Saharan Africa, reports that up to 25% of children aged 15–19 have had sexual relations before the age of 15 years. In most countries, ≥5% of women are reported to be married before the age of 15, and >20% have given birth. First time having sex and giving birth is more common in women who live in rural areas that are less educated. Having sex with changing partners is more common in men than women, but decreases with time [4]. The results of the 2012 Adolescent Reproductive Health Survey showed that adolescent knowledge about reproductive health was inadequate, where only 35.3% of adolescent girls and 31.2% of adolescent boys aged 15 years knew that women could get pregnant with one times of sexual intercourse, and only 9.9% of teenage girls and 10.6% of teenage boys have comprehensive knowledge about HIV/AIDS [5].

The National Family Planning Coordinating Board (BKKBN) examined 8084 adolescents aged 15–24 years in 20 districts in West Java, Central Java, East Java, and Lampung. Sexual behavior in adolescents aged 15–24 years continues to increase every year, due to dating behavior that is often excessive [6].

Changes in views on sexuality are thought to have caused a major shift in sexual habits and lifestyles

especially young people [7]. Research by Ninik at 2010 in Deran shows that there is a significant relationship between unsafe sexual behavior and reproductive health knowledge with a p = 0.000 with alpha 0.05 [8].

Teenage boys have the opportunity to engage in risky sexual behavior in dating 6.8 times greater than teenage girls. This is related to the hormone testosterone which causes a man to be more sensitive to stimulation which causes sexual sensations. Testosterone levels in the blood will also make the brain activate the mind, so adolescent boys are more prone to erections compared to adolescent girls if stimulated or sexually stimulated, both from vision, hearing, and also touch [9].

This evidence reflects that the lack of understanding of adolescents about healthy life skills and the risk of sexual relations. Findings from various studies indicate that increased sexual activity among adolescents, not accompanied by increased knowledge about sexual and reproductive health [10]. Knowledge lower 1.5 times more likely to perform premarital sexual behavior at risk than adolescents who have high knowledge. This low knowledge can be caused by a lack of proper and correct understanding of the risks and impacts of the actions taken [11]. On the description of these problems, researchers are interested in conducting research on the characteristics of adolescents at first sexual intercourse.

Materials and Methods

The 2017 Indonesian Demographic and Health Survey (SDKI) was conducted by the Central Statistics Agency (BPS) and in collaboration with the National Population and Family Planning Agency (BKKBN) and the Ministry of Health. Survey funding was provided by the Government of Indonesia. In implementation, Indonesia got help from Inner City Fund International through project Demographic and Health Surveys (DHS) program, a program of United States Agency for International Development (USAID) provided funding and technical assistance in the implementation of population survey and health in many countries.

Data collection took place in 34 provinces, 47,963 households in Indonesia. This type of research is quantitative with a cross-sectional method based on the 2017 IDHS data design. The population is all unmarried men aged 15–24 years who were successfully interviewed as many as 13,079 people. The research sample is as many as 12,523 people after Mel Alui process of cleaning based on the variables examined and the answers of respondents who missed (the symbol 9 on the data IDHS 2017) as well as the answers do not know (symbol 8 on the data IDHS 2017) respondent on the dependent variables.

In this study, the data collection method used is to use secondary data from the 2017 IDHS data on the Adolescent Reproductive Health sub-survey. This data were obtained from the National Population and Family Planning Agency (BKKBN) of Indonesia. Before data collection, researchers observed the 2017 IDHS questionnaire to find out any questions relating to sexual behavior and factors related to premarital sexual behavior of young men.

Data analysis uses univariate analysis which aims to explain the characteristics of male teenage respondents. Univariate analysis functions to explain or describe the characteristics of the research variables processed by looking at the percentage.

Results

The results of the study in Table 1 show that the distribution of young men with the highest number was at the age of 15 years, namely, as many as 1686 people (13.5%) while the respondents with the smallest number were at the age of 24 years as many as 743

Table 1: Distribution of young men by age in Indonesia in 2017

Age	Frequency (n)	Percentage
15 years	1686	13.5
16 years	1652	13.2
17 years	1777	14.2
18 years	1339	10.7
19 years	1263	10.1
20 years	1163	9.3
21 years	1003	8.0
22 years	1022	8.2
23 years	875	7.0
24 years	743	5.9

Table 2: Distribution of respondents by age for first time conducting sexual relations in young men in Indonesia in 2017

First time for sexual intercourse	Frequency (n)	Percentage
11 years	2	0.2
12 years	10	0.8
13 years	19	1.5
14 years	45	3,6
15 years	134	10.7
16 years	194	15.4
17 years	254	20.2
18 years	216	17.2
19 years	141	11.2
20 years	144	11.4
21 years	54	4,3
22 years	29	2,3
23 years	5	0.4
98 (do not know)	11	0.9

people (5.9%). Table 2 illustrates the distribution of young men by the age of first doing sexual intercourse on adolescent the largest man was at age 17 years that as many as 254 people (20.2%), while the smallest percentage in 11 years is that as many as 2 (0.2%).

Table 3 illustrates the distribution of male adolescents based on the highest level of education, the highest being at the level of high school/vocational/MA/equivalent level as many as 7370 people (59.2%). While the smallest level of tertiary education is found at the Academy/DI/DII/DIII level which is 266 people

Table 3: Distribution of respondents based on youth education in Indonesia at 2017

Highest education	Frequency (n)	Percentage
Never/currently in school	64	0.5
SD/MI/Equal	1142	9.1
SMP/MTs/Equivalent	2028	16.2
SMA/SMK/MA/Equal	7370	58.9
ACADEMY/DI/DII/DIII	266	2.1
Diploma IV/University	1652	13.2

Table 4: Distribution of respondents who are dating on male young in Indonesia in 2017

In a relationship	Frequency (n)	Percentage
In a relationship	5476	43.7
Not dating	7047	56.3

(2.1%). Table 4 illustrates that the contribution of male adolescents who are not dating is as much as 7047 people (56.3%) compared to those who are dating that is as many as 5476 people (43.7%).

Discussion

This study shows that the characteristic description of adolescents is that most young men are 15 years old, the highest level of education is at the high school/vocational/MA/equivalent level, male adolescents who are not dating are higher than those who are not dating, and adolescents most men have the first sexual intercourse is at the age of 17.

The distribution of male adolescents based on age for the first time having sexual intercourse with the biggest male adolescents is at the age of 17 years which is 254 people (20.2%), while the smallest percentage is at the age of 11 years which is as much as two people (0.2%).

This is consistent with research Rosdarni *et al*. [12] showed that the data IDHS 2007 in Kendari recorded 13.3% of adolescents aged 15–19 years were surveyed admitted to having sex Cuma time at the age of 15 years. Adolescence or adolescence comes from the Latin word adolescere (the word adolescentia which means adolescent) which means “to grow” or “grow into adulthood.” The term adolescence as used today has a broader meaning, which includes mental, emotional, social, and physical maturity [13].

Indonesia has a population of ± 233 million. Based on 2009 BKKBN data, the number of adolescents aged 10–24 years reached 64 million or 27.6% of the total population of Indonesia and in 2010, it increased to 657 million. In the perspective of population collected by the National Population and Family Planning Agency (BKKBN), the size of the population of this youth group will greatly influence population growth in the future. Teenagers need to get serious attention considering that they are still in school age and working age, they will enter the workforce and enter reproductive age [14].

The survey, which uses secondary data from the 2012 IDHS on adolescent reproductive health, was conducted on unmarried adolescent girls and men. The results are 8.3% of teenage boys and 1% of teenage girls have premarital sex. Most sexual intercourse was carried out in adolescents aged 20–24 years by 9.9% and 2.7% at the age of 15–19 years. The same survey almost 80% of respondents had held hands, 48.2% of male teenagers, 29.4% of female teens had kissed, and 29.5% of male teenagers and 6.2% of female teenagers had stimulated each other of the total teenagers surveyed. The influence of the increase was through mass media, print media, TV and radio, online web, and other social networks. And the influence of peers who have had premarital sex [6].

Adolescents aged 20–24 years have 2.3 times the chance to have risky sexual behavior compared to adolescents aged 15–19 years. This is influenced by changes and developments that occur during adolescence. As adolescents get older, the reproductive organs that influence sexual drive develop so that a person begins to feel clearly the increase in sex drive that can arise in the form of attraction toward the opposite sex and desire to get sexual satisfaction [10]. In other words, adolescents aged 20–24 years will undergo a process of sexual maturity that is more advance than adolescents aged 15–19 years old so late teens has sexual urges greater than the initial or middle teens. Similar research shows the same thing, there is a significant relationship between age and adolescent risk behavior, including premarital sexual behavior.

The results of the Indonesian Demographic and Health Survey 2012 in Wijayanti show that adolescents begin dating at the age of 15–17 years. Approximately 33% of female adolescents and 34.5% of male adolescents aged 15–19 years dating before the age of 15 years. Based on the results of the 2002 IDHS and 2007, premarital sexual relations were mostly carried out at the age of 20–24 years, 9.9% and 15–19 years of age 2.7% [15], [16], [17].

This is consistent with the results of research Rusmiati [10] that there is a significant relationship ($p = 0.000$; OR = 2.3; CI = 2.1–−2.6) between the ages of age (divided into ages 15–19 years and 20–24 years) with sexual behavior in dating.

Conclusion

It is expected that the role of parents, schools, health centers, and health offices in providing information related to comprehensive reproductive health education.

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Factors Affecting Pregnant Women's have Nothihg in Prevention of Mother-to-Child Transmission Examination in Public Health Centers of Makassar in 2019

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Abstract

BACKGROUND: Prevention of mother-to-child Human Immunodeficiency Virus (HIV) transmission or prevention of mother-to-child transmission (PMTCT) is part of efforts to control HIV-Acquired Deficiency Syndrome and sexually transmitted infections. In Indonesia, there were 1,805,993 pregnant women who were tested for HIV and there were 5074 (0.28%) pregnant women who were HIV positive.

AIM: The purpose of this study was to analyze the factors that influence pregnant women not to conduct a PMTCT examination in Makassar City in 2019.

METHODS: This study was an observational analytic study with cross-sectional design. The sample in this study was 260 pregnant women in the working area of the Sudiang Raya Health Center and Antang Perumnas Makassar City. Data were analyzed using Chi-square test and multiple logistic regressions.

RESULTS: The results showed that education affected pregnant women who did not conduct PMTCT examination with p = 0.013 (p <0.05) with odds ratio = 4.571 and there were some variables that were not significant such as age variable with p = 0.700 (p> 0.05), knowledge p = 0.621 (p > 0.05), perceived susceptibility p = 0.467 (p > 0.05), and perceived severity p = 1000 (p > 0.05).

CONCLUSION: It was concluded that education affects pregnant women who do not conduct PMTCT examinations and for age, knowledge, perceived susceptibility and perceived severity do not affect pregnant women who do not conduct PMTCT examinations in Makassar City.

Introduction

Human Immunodeficiency Virus (HIV) is a disease caused by a virus that attacks white blood cells causing a decrease in the immune system, while Acquired Deficiency Syndrome (AIDS) is a collection of signs or symptoms that will arise due to a decrease in the immune system due to infection by a virus. HIV/AIDS continues to be a major health problem for the global community and requires serious attention because every year the numbers increase [1].

Prevention of mother-to-child transmission (PMTCT) is part of efforts to control HIV-AIDS and sexually transmitted infections (STIs) in Indonesia and the Maternal and Child Health Program (MCH). PPIA services are integrated with MCH, family planning (KB), reproductive health, and adolescent health service packages at every level of health services in the HIV-AIDS and STI continuous comprehensive service strategy [2].

Globally, HIV incidence has decreased from 0.40/1000 uninfected populations in 2005–0.26 per 1000 uninfected populations in 2016. The African region remains the most affected by HIV, with an incidence rate of 1.24/1000 uninfected populations in 2016. In 2016, an estimated 1 million people died due to HIV-related illnesses, 120,000 of whom were children under the age of 15. The global increase in antiretroviral therapy (ART) has been a major driver of a 48% reduction in HIV-related deaths from a peak of 1.9 million in 2005. In mid-2017, around 20.9 million people received ART. However, ART only reached 53% of people living with HIV at the end of 2016, and rapid response acceleration is needed to increase the scope of care, along with other interventions throughout the service chain, including prevention, diagnosis, and chronic care [3].

According to data on the health profile of South Sulawesi province in 2018 out of 24 cities/regencies in South Sulawesi province, Makassar is the highest case of HIV/AIDS, with 772 HIV sufferers and 381 AIDS sufferers. Next is Bone with 77 HIV sufferers and 38

AIDS sufferers and Palopo with 71 HIV sufferers and 54 AIDS sufferers [4].

In recent years, various types of HIV control services in Indonesia have progressed and the number of people using them has also increased so that the goals of HIV control can be implemented. However, there are still several sub parts of the program that have not met the target. Because of the high number of HIV/AIDS cases and the lack of PMTCT coverage, the study aims to analyze the factors affecting pregnant women who did not conduct PMTCT examinations at Puskesmas Sudiang Raya and Antang Perumnas Makassar City in 2019.

Materials and Methods

This type of research is an observational analytic study with the research design used is cross-sectional study. This research was conducted in the Sudiang Raya Health Center and Antang Perumnas Makassar City in September 2019.

The population in this study were all pregnant women who did ANC in January-July 2019 in the working area of the Sudiang Raya Health Center as many as 605 pregnant women and Puskesmas Antang Perumnas as many as 413 pregnant women. The samples in the study were 260 respondents divided by 155 respondents in the Sudiang Raya Community Health Center and 105 in the Antang Public Health Center.

Data collection was carried out by distributing questionnaires that were prepared in accordance with the objectives of the study given to respondents selected as research samples at the Sudiang Raya Health Center and the Antang Perumnas Health Center.

Data analysis techniques using univariate analysis, bivariate analysis with Chi-square test and multivariate analysis with multiple logistic regression in the SPSS For Windows Program.

Results

Table 1 shows the characteristics of respondents consisting of age and education. Most respondents in the age group <20–35 years old were 222 (85.3%), while 38 respondents (14.7%) were in the age group >35 years. For education variables, the most respondents were high school education as many as 130 respondents (50.0%), while the fewest respondents who were not in school were 1 respondent (0.4%).

Table 1: Distribution of mothers pregnant is not doing examination PMTCT based on the characteristics of capital

Characteristics	N	%
Age of respondents		
<20-35 years	222	85.3
>35 years	38	14.7
Education of respondents		
No school	1	0.4
Elementary school	12	4.6
Middle school	32	12.3
High school	130	50.0
Tertiary institution	85	32.7

PMTCT: Prevention of mother-to-child transmission.

Table 2 shows the distribution of respondents based on research variables. Distribution of respondents based on PMTCT status, most respondents who were PMTCT were 247 (95.0%) while respondents who were not PMTCT were 13 (5.0%). Distribution of respondents based on age mostly at young age as many as 223 respondents (85.5%), while respondents at old age were 37 respondents (14.2%). Distribution of respondents based on education mostly in higher education as many as 215 respondents (82.7%), while respondents who had low education were 45 respondents (17.3%). Distribution of respondents based on knowledge most of the knowledgeable enough is 235 respondents (90.4%), while respondents who lack knowledge are 25 respondents (9.6%). Distribution of respondents based on the perceived susceptibility most of the respondents with enough perceived susceptibility is 248 respondents (95.4%), while respondents with less perceived susceptibility are 12 respondents (4.6%). Distribution of respondents based on the perceived severity most of the respondents with enough perceived severity is 240 respondents (92.3%), while respondents with a perceived severity are less as many as 20 respondents (7.7%).

Table 2: Distribution of mothers pregnant is not doing examination PMTCT

Perception	n	%
PMTCT examination		
No PMTCT	13	5.0
PMTCT	247	95.0
Age		
Young	223	85.8
Old	37	14.2
Education		
Low	45	17.3
High	215	82.7
Knowledge		
Less	25	9.6
Enough	235	90.4
Perceived Susceptibility		
Less	12	4,6
Enough	248	95.4
Perceived Severity		
Less	20	7.7
Enough	240	92.3

PMTCT: Prevention of mother-to-child transmission.

Table 3 shows the distribution of respondents based on research variables on the PMTCT examination. Respondents who experienced PMTCT were more likely to occur at a young age, as many as 12 respondents (5.4%) compared to respondents who were older, namely, 1 respondent (2.7%) with a $p > 0.05$. Respondents who experienced PMTCT were more likely to be respondents with tertiary education as many as seven respondents (3.3%) compared to low education respondents, that is, as many as six respondents (13.3%) with $p < 0.05$. Respondents who experienced PMTCT were more likely to have sufficient knowledge, namely, as many as 13 respondents (5.5%) compared

Table 3: Factors affecting pregnant women not doing the PMTCT examination

Variable	PMTCT						p-value
	No PMTCT		PMTCT		Amount		
	n	%	n	%	n	%	
Age							
Young	12	5.4	211	94.6	223	100.0	0.700
Old	1	2.7	36	97.3	37	100.0	
Education							
Low	6	13.3	39	86.7	45	100.0	0.013
High	7	4.7	208	96.7	215	100.0	
Knowledge							
Less	0	0.0	25	100	25	100.0	0.621
Enough	13	5.5	222	94.5	235	100.0	
Perceived susceptibility							
Less	1	8.3	11	91.7	12	100.0	0.467
Fair	12	4.8	236	95.2	248	100.0	
Perceived severity							
Less	4	19.0	17	81.0	21	100.0	0.014
Enough	9	3.8	230	96.2	239	100.0	

PMTCT: Prevention of mother-to-child transmission.

to respondents who lacked knowledge with a value of p > 0.05. Respondents who did not PMTCT were more likely to have experienced perceived susceptibility, namely, as many as 12 respondents (4.8%) compared to respondents who were less susceptible perceptions, namely, as many as 1 respondent (8.3%) with a p > 0.05. Respondents who did not have PMTCT were more likely to have sufficient perceived severity, as many as 12 respondents (5.0%) compared to respondents with less perceived severity, namely, as many as 1 respondent (5.0%) with a p > 0.05.

Table 4 shows the conclusions of multivariate analysis with multiple logistic regressions of the five independent variables entered into the test simultaneously only education has a consistent significance. Hence, it can be concluded that education with an odds ratio value of 4.571 > 1 is a risk factor with a lower-upper value = 1458–14,334, which means pregnant women with low education are 4 times more likely to not have PMTCT examinations compared to pregnant women with higher education.

Table 4: Results of test multivariate factors that affect mothers pregnant do checks PMTCT in Makassar city year 2019

Variable	B	Wald	Df	p-value	OR	95% CI for Exp (B)	
						Lower	Upper
Education	1.520	0.583	1	0.009	4.571	1.458	14.334

PMTCT: Prevention of mother-to-child transmission, OR: odds ratio.

Discussion

This study shows that there are several factors that do not affect pregnant women undergoing PMTCT examinations. Where there are several factors including education, age, knowledge, perception of vulnerability, and perception of severity.

This research shows that education influences pregnant women who do not conduct PMTCT examinations in Makassar City. Education is the last formal education ever completed by respondents. The high level of education causes pregnant women to be compliant with examinations in pregnancy, including screening for HIV/AIDS. Likewise, highly educated mothers will check their pregnancy in an orderly manner while maintaining the health condition of herself and the fetus it contains. The education of respondents in this study is good but higher education does not necessarily describe the acceptance of pregnant women toward PMTCT examinations.

This study is not in line with the research of Halim [5], the results of bivariate analysis showed that a statistical test with a significance level of 5% was obtained p = 0.550, which means that statistically there was no relationship between education and HIV examination behavior. Research Setiyawati and Meilani [6] is not in line with this study that there is no relationship between the levels of education with HIV test behavior in pregnant women. This study is in line with the study of Umar and Erni [7] which concluded that there was a significant relationship between education and the acceptance of HIV testing by pregnant women.

This study also showed that age, knowledge, perceived susceptibility, and perceived severity did not affect pregnant women who did not conduct PMTCT examinations in Makassar City. For the age variable, age is the length of life that passed from the time of birth until the time of the study. The age of respondents in this study is 17 years and the lowest is 45 years. HIV testing behavior more at a young age than old age because of the perception of HIV risk is low when you get older. This research is in line with Halim *et al*. [5] which states that there is no relationship between age and the behavior of pregnant women in HIV testing

For the knowledge variable, the knowledge referred to in this study includes knowledge about behavior that has the potential to transmit HIV/AIDS, body fluids that can transmit HIV/AIDS, ways to find out someone infected with HIV/AIDS, HIV counseling and testing, PMTCT services, how to prevent HIV transmission from a pregnant woman to her fetus. For the respondents' knowledge, most of them are knowledgeable, but sufficient knowledge cannot be used as a benchmark for someone taking an HIV test themselves. This study is not in line with research conducted by Arniti *et al*. [8] which shows that there is a relationship between knowledge of pregnant women and the acceptance of HIV testing. This study is in line with Fatimah and Hati [9] which concluded that there is no relationship between the levels of knowledge of pregnant women about HIV/AIDS with PITC examination behavior in pregnant women at the Sleman Yogyakarta Public Health Center.

For the susceptibility variable, perceived susceptibility is not a factor that influences a person to conduct PMTCT examination. This is because respondents already know that HIV/AIDS is an incurable disease so that respondents feel the need to conduct PMTCT examinations. This study is in line with the study of Wenny *et al*. [10], there is no relationship between

susceptibility perceptions with HIV testing in pregnant women. Legiati *et al*. [11], there is a relationship between perceived susceptibility with test behavior.

For the severity variable, a person who has sufficient perceived severity about an illness is not always in line with the behavior in his life [11], [12], [13], [14]. This can be influenced by environmental factors that are driving so that someone is motivated to adopt healthy behaviors. This study is in line with Wenny *et al*. [10] perceived severity not significantly related to HIV test behavior in pregnant women. This study is not in line with the research of Arniti *et al*. [8] obtained a significant relationship between the perceived severity with the acceptance of HIV testing by pregnant women.

Recommendation

It is expected that an increase in information and education communication (IEC) communication services for health workers regarding HIV and PMTCT information so that pregnant women have additional knowledge about HIV and PMTCT especially pregnant women with education who are not in school and have completed primary school.

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Influence of Education and Parental Income of Parents on Early Marriage for Young Women the Village Baranti Districts Baranti Regency Sidenreng Rappang

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Abstract

BACKGROUND: Early marriage is a marriage with a relatively young age under the age of 16 years. The phenomenon of early marriage many occur in Indonesia. Globally, 80% of girls aged 10–16 years have a 5 times greater risk of dying in cases of pregnancy and childbirth than women aged 20–24 years. Early marriage factors are: Coercion from parents, promiscuity, curiosity about the world of sex, socio-cultural factors, economic pressure, level of education, difficulty in getting a job, mass media, and views and beliefs.

AIM: This study aimed to analyze the socio-cultural determinants that influence the incidence of early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

METHODS: The design of this study is a cross-sectional study design with a simple random sampling technique carried in Village Baranti, District Baranti. The population in this study was 165 people and the number of samples 102 people. Data were collected by interview and questionnaire. Data were analyzed using Chi-square analysis.

RESULTS: The results showed that the significant of the incidence of early marriage was fathers education (p = 0.023), mothers education (p = 0.041), and parental income (p = 0.036).

CONCLUSION: It was concluded that there was a relationship between education father, mothers' education, and parents' income, toward the occurrence of early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

Introduction

Early marriage is a marriage carried out by someone who has a relatively young age. Age in question is the age of puberty, which is the age between 10 and 19 years [1]. Ideal marriage is a marriage done by a man with a minimum age of 25 years and a minimum age of a woman of 20 years [2]. The phenomenon of early marriage is common in Indonesia. This has been happening for a long time in several regions scattered in parts of Indonesia, especially in rural and rural areas [3] with a variety of backgrounds such as social, economic, and cultural [4]. Besides, the couple was forced to get married early due to the pregnant woman before marriage [5].

Adolescence is a transition between childhood and adulthood. Adolescence at this stage has not yet reached sexual maturity that is the ability to carry out the process of reproduction [6]. Child marriage is a serious problem faced by developing countries including Indonesia [7]. Reproductive health problems are started with early marriage, that is, at the age of women 10–54 year there were 2.6% married at the age of <15 years and then 23.9% were married at the age of 15–19 years [8].

UNDESA (2010) Indonesia is the 37th country with the second highest percentage of early marriage in ASEAN after Camboja A UNICEF study in Indonesia found that the incidence of marriage for 15-year-olds is around 11%, while at 18 years of age around 35% [9], [10], [11]. There are 158 countries with legal age of marriage at the age of 18 years and over but in Indonesia, the age of early marriage is 16 years and there are even under the age of 16 years [12], [13].

The Government of Indonesia through Law Number 1 of 1974 provides a limit on the age at which a person is permitted to marry. Law Number 1 of 1974 in Article 7 Paragraph (2) states that marriage is only permitted if the man has reached the age of 19 years and the woman has reached the age of 16 years [8], while Article 26 of RI Law Number 23 of 2002 concerning Child Protection states that parents are required to protect children from early marriage [14].

The results of research conducted by Pohan [15] show that there is a relationship between

knowledge, education, employment, status economic, culture, promiscuity, and media mass with early marriage in young women and there is no relationship between the role of parents with early marriage in young women and the most factor dominant related to early marriage in young women is knowledge.

Based on the above background and the previous studies, the aim of researcher is knowing the effect of education and income of parents in Village Baranti, District Baranti, Regency Sidenreng Rappang, South Sulawesi.

Materials and Methods

This research was conducted in Village Baranti, District Baranti, Regency Sidenreng Rappang. This type of research is quantitative with a cross-sectional study.

The population is all married young women aged 14–20 years. The sample of 102 people chosen by simple random sampling that has met the inclusion criteria is all young women aged 14–20 years who married in 2018–2019 in Village Baranti, District Baranti, Regency Sidenreng Rappang and were willing to participate in this study by signing an informed consent issued by the Ethics Committee of the Faculty of Public Health, Hasanuddin University.

Data collection techniques in this study using primary data obtained directly through observation to respondents using a questionnaire. Other than that, besides that, using interpersonal interview techniques to obtain data that are needed related to marriages conducted by teenagers. Secondary data in this study were data obtained from the office of religious Affairs in Village Baranti, District Baranti, Regency Sidenreng Rappang, namely, the address and number of adolescents aged 14–20 years who were married in 2018–2019 in Village Baranti, District Baranti, Regency Sidenreng Rappang.

Data processing is done using computerization through the SPSS program which includes: Editing (checking form and questionnaire), coding (coding for each variable with the aim of making it easier to identify research variables), data entry (entering data from the questionnaire into the SPSS program), and cleaning (cleaning errors that might occur during the data input process). In this study, there are two stages of analysis univariate analysis and bivariate analysis. Univariate analysis was carried out on each variable from the results of the study which subsequently resulted in the distribution and presentation of each variable studied. In addition, bivariate analysis was carried out to see the relationship between two variables in the form of cross tabulation using the SPSS application with the Chi-square statistical test.

Results

Table 1 shows that the distribution of respondents based on age 14 years was 26.5%, age 15 years was 43.1%, age 16 years was 7.8%, age 17 years was 14.7%, age 18 years by 2.0%, by age 19 years by 1.0% and by age 20 by 4.9%. The group of teenagers who married early age 14–16 years was 79 people and the youth group of ages 17–20 was 23 people, the distribution of respondents based on the level of education the most widely married early is the group of junior high school education level of 74 people (72.5%), while the number of respondents in the high school education group is 28 people (27.5%).

Table 1: Distribution of respondents based on the characteristics of respondents in Village Baranti, District Baranti Regency Sidenreng Rappang

Characteristics respondent	n	%
Age group		
≤14 years	27	26.5
15 years	44	43.1
16 years	8	7.8
17 years	15	14.7
18 years	2	2.0
19 years	1	1.0
>20 years	5	4.9
Education of respondent		
SMP	74	72.5
SMA	28	27.5

Table 2 shows that the early age group 67.7% fathers respondents had low education and high education whereas in the age group of not getting married early 32% fathers' respondent had education low and 55.0% had education high. Based on the results of the analysis of the Chi-square test the p-value (0.023) < α (0.05), Ha is accepted meaning that there is a relationship between fathers' education and early marriage in Village Baranti, District Baranti Regency Sidenreng Rappang.

Table 2: The relationship between education fathers and early marriage In Village Baranti, District Baranti Regency Sidenreng Rappang

Fathers education	Early marriage				n	%	p-value
	Get marriage early		Not marriage early				
	n	%	n	%			
Low	42	67.7	20	32.3	62	100.0	0.023
High	18	49.0	22	55.0	40	100.0	

Table 3 shows that in the age group of early marriage 66.7% of respondents mothers had low education and 46.2% had high education. Whereas in the unmarried age group 33.3% of respondents' mothers had low education and 53.8% had high education. Based on the results of the analysis of the Chi-square test obtained p value (0.041) < α (0.05) Ha, it means that there is a relationship between maternal education and early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

Table 3: The relationship between education mothers and early marriage In Village Baranti, District Baranti Regency Sidenreng Rappang

Mothers education	Early marriage				n	%	p-value
	Get marriage early		Not marriage early				
	n	%	n	%			
Low	42	66,7	21	33,3	63	100,0	0,041
High	18	46.2	21	53.8	39	100.0	

Table 4 shows that based on the above table shows that in the age group of early marriage 67.2% was low income and 46.3% was high income, whereas in the unmarried age group 32.8% had low income and 53.7% had high income. Based on the analysis of the Chi-square test the p-value (0.036) 36 α (0.05), Ha is accepted meaning that there is a relationship between fathers income and early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

Table 4: The relationship between income parents and early marriage in Village Baranti, District Baranti Regency Sidenreng Rappang

Income parents	Early marriage				n	%	p-value
	Get marriage early		Not marriage early				
	n	%	n	%			
Low	41	67.2	20	32,8	61	100.0	
High	19	46.3	22	53,7	41	100.0	0.036

Discussion

In this research was seen that significantly affecting the occurrence of early marriage was education fathers, education mothers, and income parents who significantly influence the occurrence of early marriage, which are fathers' education, mothers' education, and parents' income.

Education is one thing that is highly required by every government in any country Indonesia meant. Evidenced by the existence of a law governing the procedures for implementing education in Indonesia, namely, starting from elementary school to junior high school age which is included in the 9-year compulsory education system, then school/vocational levels up to tertiary level including diploma, bachelor, master, and doctorate to professor.

According to law No. 20 of 2003 article 3 education aims to educate the life of the nation and develop Indonesian people fully, namely, people who believe and devote to god almighty and virtuous character, have knowledge and skills, have physical and spiritual health, personality a steady, and responsible social and nationality.

The results showed that in the age group of early marriage 67.7% of respondents fathers had low education and 45.0% had high education, whereas in the age group of not getting married early 32% of respondents fathers had low education and 55.0% had high education. And in the age group of early marriage, 66.7% of respondents mothers had low education and 46.2% had high education, whereas in the unmarried age group 33.3% of respondents mothers had low education and 53.8% had high education.

Based on the analysis of Chi-square test results obtained p value (0.023) and (0.041) α α (0.05) Ha accepted means that there is a relationship between parents education toward early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

The study is in line with research conducted by Dwinanda [16] with the title of the relationship between maternal education and knowledge of respondents with early marriage in Plaosan Sub district, Magetan Regency, East Java 2015. This study was an observational study with a case control design using the Chi-square statistical test with a total sample of 76 cases and 76 controls. Chi-square statistical test results show that there is a relationship between parental education and early marriage (p = 0000: odd ratio = 9.821; 95% confidence interval = 4.657–20.714).

Parent income is the entire income received by someone whether coming from direct involvement in the production process or not. Family income in this study is all forms of children need that must be met such as children education costs, allowances, and other needs. The results showed that in the age group of early marriage 67.2% were income low and 46.3% were income high, whereas in the unmarried age group 32.8% had income low and 53.7% had income high. Based on the analysis of the Chi-square test, p-value (0.036) 36 α (0.05) Ha is accepted, meaning that there is a relationship between fathers income and early marriage in Village Baranti, District Baranti, Regency Sidenreng Rappang.

This study is in line with research with the title of factors related to early marriage in young women in Tambusai District, Utara Regency Rokan Hulu. This research is a qualitative research. The results showed that parental income affected early marriage. The thing that influences the incidence of early marriage is not from the perspective of teenage work but rather the work of parents. Parents work reflects the socioeconomic status of the adolescent's family. A person's life is supported by the economic capacity of the family a family that is in the poverty line will make the decision that to ease the burden on their parents, the daughter is married to those who are considered capable [15], [16], [17].

Recommendation

It is hoped that the Regional Government of Sidenreng Rappang Regency will be more strict in applying sanctions for violators of the marriage law in accordance with applicable regulations, and parents or families should equip their children with education to a higher level so that they develop critical thinking patterns and rational, especially in preparing for their marriage.

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Reinforcers and Inhibitors of Family-based Stunting Children Parenting (Case Studies in Slums Area of Makassar City)

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Abstract

BACKGROUND: Stunting is a condition of failure to thrive in toddlers (5-year-old babies) with length or height of the body under minus two standard deviations (<−2SD). This is caused by chronic malnutrition and recurrent infections, especially in the first 1000 days of life.

AIM: This study aimed to examine the parenting style of family-based stunting children seen from the reinforcers and inhibitors of stunting in Makassar City Slums.

METHODS: This type of research is qualitative research with a case study approach. Informants, in this study, were 26 people, consisting of families with stunting children aged 0–59 months in 2019 as many as 14 people, families who have stunting children aged 0–59 months in 2018 and are free from stunting as many as four people, one nutritionist, four Integrated Healthcare Center cadres, and three Community Leaders/Religious Leaders. Analysis of the data used is content analysis which is then interpreted and presented in the form of narratives, matrices, and schemes.

RESULTS: The reinforcers factors consisting of adequate health service support and family members provide support in caring for children and providing nutritious food. While the inhibiting factors consist of uncertain family income for the daily needs of family members, and irregular nutritional food intake is given in a day. The need for nutrition education for community stunting management was analysed by the public health center and integrated health-care center through a program to improve the first 1000 days of life and increase family planning coverage.

CONCLUSION: Based on the results of research and discussion of the reinforcers factor of family-based stunting children parenting in the slums of Makassar City. Hence, it can be concluded that the reinforcers factor consists of support for health services that are already quite good, and family members provide support in child care. While the inhibitors factors consist of uncertain family income for the daily needs of family members, and irregular nutritional food intake is given in a day.

Introduction

Stunting is a condition of failure to thrive in toddlers (5-year-old babies) with a length or height of the body under minus two standard deviations (<−2SD). This is caused by chronic malnutrition and recurrent infections, especially in the first 1000 days of life. Thus, the child's height is shorter and very short compared to normal children his age and has a delay in thinking [1], [2].

Parenting is an important role for growth disorders in children. There are three components that must be considered, namely, food, health, and psychosocial stimulation are factors that play a role in optimal child growth [3], [4]. Parenting is an interaction between parents and children consisting of caring practices and the practice of providing food to children [5]. There is a relationship between parenting parents in terms of caring attitude and practice of feeding toddlers with the nutritional status of toddlers (weight/age) [6]. The better parenting provided, the better the nutritional status of toddlers and vice versa if the mother provides poor parenting in providing food to toddlers, the nutritional status of toddlers will also be disrupted [7].

Nutrition Status Monitoring in 2016 in Makassar City prevalence of stunting was 25.2%, while the 2018 data prevalence of stunting 5.04% and increased again in June 2019 by 2.97% [8]. The previous research conducted in Tallo District showed that the number of stunting children aged 18–23 months was 39.3%. Where there is a significant relationship between the attention/support of mothers to children in the practice of feeding, psychosocial stimulation, hygiene/hygiene, and environmental sanitation as well as the utilization of health services with the occurrence of stunting. Based on Sakti [9] conducted in Slum City of Makassar, based on primary data from the Rappokalling Community

Health Center, the number of stunting children aged 24–59 months was 25.4% and the results showed a relationship between LBW risk, breastfeeding which is not exclusive, a history of infectious diseases, maternal education, and low income are risk factors for stunting. Nutritional care is also a pattern of behavior in the practice of providing care performed by parents, grandparents, grandmothers, caregivers, nurses or even neighbors, and siblings who are related to nutritional status. There are three factors that influence nutrition parenting, namely, sociocultural, and political and economic conditions [10].

Based on some of the facts that have been described in the previous paragraphs, it can be seen that although there has been a lot of research related to the determinants and patterns of handling stunting in Indonesia, particularly in the aspect of giving care. However, there is still little research related to aspects of reinforcers and inhibiting family-based parenting. This study examines the reinforcers and inhibitors aspects of the adoption of family-based stunting parenting in the Slums of Makassar City.

Materials and Methods

This research was conducted in the Slums of Makassar City in four villages, namely, Rappokalling, Tammua, Buloa, and Tallo which are the working areas of the Rappokalling Health Center. The research approach used in this research is a case study approach with qualitative research type.

There are 26 informants in this study, consisting of the main informants divided into two families "A" (families who have stunting children aged 0–59 months in 2019 and are still stunted) 14 people and families "B" (families who have stunting children) age 0–59 months in 2018 and free from stunting) four people, supporting informants, namely, one Nutrition Officer, four Integrated Healthcare Center Cadres, and three Community Leaders/Religious Leaders. The age of the informants interviewed in-depth interviews ranged from 21 to 61 years.

Primary data were collected through observation to obtain information about the general picture of parenting reinforcers and inhibitors of family-based stunting children, interviews with in-depth interviews (in-depth interviews) conducted on key informants and supporting informants, based on interview guidelines that have been prepared.

The analysis of the data used in this study is content analysis which is then interpreted and presented in the form of narratives and matrices. Content analysis is used to draw conclusions through attempts to find the characteristics of the message and is carried out objectively and systematically.

Results

Reinforcers factors

Reinforcers factors health education for family-based stunting child care in the slums of Makassar City consists of support for health services, and family support. The following are excerpts from interviews with informants about the reinforcers factors.

"...Iya adaji kaya apa itue suntikan anu' tambahan Rubella dengan vitaminto diinformasikan Eh, sebentar pembagian vitamin kesana ke Posyandu datang meki…" (SS, 41 Tahun)

"...Iyaa...sendiriki dengan 30 Posyandu dededeee...Dibantumi sama anu kedong teman-teman lintas program dibantu sama kader, kader aktifji bagaimana tidak aktif ada insentifnya ada absennya juga suka rela sebenarnya cuma dikasi insentif..."(EV, 42 Tahun-Petugas Gizi)

"...Dekatji kalo yang disini di belakang kantor lurah tapi kalo yang disana iyya jauhki kalo mauki periksa disitu baru biasa dirujukki kesana kalo nda bisa disini. Di pustu masih kurang dokter dan alatnya jadi pasti selalu dikasi rujukan ke Rappokalling..." (RT, 38 Tahun)

From interviews with informants it is known that the type of information provided by health workers is, provision of vitamins and additional injections of Rubella, information about non-communicable diseases, pregnancy problems, infants and toddlers, and environmental health through counseling. Related to the availability of health human resources; in this case, Nutritionists are known to be overwhelmed to be active directly in 30 Integrated Healthcare Center in their working area. With the Integrated Healthcare Center cadre and cross-program cooperation we can help the implementation of nutrition programs in the region. The availability of health facilities, some informants complained about the distance to the public health center but there were already integrated healthcare center and auxiliary health center which had a short distance from the community's residence and could be accessed only on foot.

The results of interviews with informants regarding family support can be seen from the following quote.

"...Didukungja semua itu sama keluargaku karna itu anu bagusji memang semua..." (ML, 31 Tahun)

"...Baa, tapi sayaji nda mendengar Heheheee biasa malas iyeee, ehh anu bikin bubur iyee yahh biasa buryam atau bur SUN ya itu saya kasi kalo orang tuaku nasarangkangnga biking iyyya tapi dehhh biasa kalo nda anui basimi malaskito namakan baru gelek-gelek kalo saya makangngi Heheheee..." (RO, 21 Tahun)

"...Jarangji bu dia ka kerjai paling anakkuji saja bantu-bantuka..." (NA, 41 Tahun)

"...iyaa...biasa kalo anu makanki bapaknya pii disitu mau makan juga makam nasi apa, biasa juga kalo naliatki kakaknya minum-minum es nangiski juga kalo nda dikasi heheheee..." (RT, 38 Tahun)

From interviews with informants, it is known that family support in child care provision in the form of exclusive breastfeeding, age of complementary feeding, and immunization get full support from family members, but sometimes parents who do not pay attention to providing nutritious food for their children. Environmental cleanliness is more dominantly done by the informants themselves, other families only help if they are on holiday and are at home. Provision of food intake what they eat to children if they want it because if not given the child will cry.

Inhibitors factors

The inhibiting factors of family-based stunting health education for family-based stunting in the slums of Makassar City consist of family income, and food intake. The following are excerpts from interviews with informants about the inhibiting factors.

"...Eee... anakku tiga , lima'ka Heheheee. Anuu...Ya'bo-ya'bokki Heehehee. Biasa ta' dua hari pi baru ditimbang biasa ta'100 biasa juga lebi kadang juga nda cukuki 100 Hehehee..." (KM, 31 Tahun)

"...Nda kerjaka mauka kerja bagaimana pernaja itu waktu bulang anu pigika mengulun tapi nda mi skarang karna jaga anak-anak baru masi skola semua yang dua kakanya ini..." (KM, 31 Tahun)

"...Baku gabungji. Iyaa, makan belanja. Biasa per pekan, biasa itu sampe 7 liter iyaa delapan. Eh, sekitar empat puluh ribu biasa ikan sayur eh kadang ikut tempe, tahu iyya itu telur karna anak-anak nda suka makan ikan. Kalo jajan iyya nda banyakji paling Rp. 5,000 ji..." (SS, 41 Tahun)

We analyzed data from the interviews related to family income chosen from the number of family members ranging from 3 to 8 people in one household. Most of the fixed income is obtained from husbands who work as day laborers. Most of the informants have additional income and there are some informants who do not have additional income except from fixed income. Allocation of daily expenses for childcare and research informant feeding where the costs incurred per day for daily food needs from morning to night starting from Rp. 30,000 to Rp. 50,000.

The results of interviews with informants regarding food intake can be seen from the following quote.

"...Inee...malaskieee biasa satu hari satu kaliji makan nasi, telur biasa makanang anuji ringanji biasa banyak namakang..." (TN, 21 Tahun)

"...Tiga kali sehari, itupun kalo anuii mintaki nasi. Anujii... biasa nasi air sayur jiii... kalo tidak ada mintai telur hehehee kalo ikan kadang-kadang'ngi makan ikan. Makan ji nasi tapi, ta'sedikitji. Kurngngi jajanna dia..." (MN, 34 Tahun)

"...Nda ada mau tongpi, ASI iyya atau makanan cemilan itu jajan-jajan kenyangmi anu gorengan yang kriuk itu jarangji gula-gula, teh Eco naminum juga terus..." (RO, 21 Tahun)

From the results of interviews related to the habit of giving meals in a day starting from 1 to 3 times a day there are even children who sometimes do not eat at all in a day the child wants more frequent snacks than eating. Foods given to children such as rice, side dishes, and vegetables even though the child's appetite are small. Providing food given to children if they are lazy to eat and more often snacks, which are to persuade children slowly to want to eat, do not force the child because if he is forced he will cry and spit out his food, give milk or formula milk.

Discussion

The results of this study indicate that the reinforcers and inhibitors factors related to family-based stunting parenting in the Slums of Makassar have several aspects. The following is a discussion of the results of the study.

The reinforcers factor for stunting parenting consists of support of health services seen from access to information where the provision of information to the public has been done by Health HR and the way of providing information is quite good because in general informants can obtain information with good health education Integrated Healthcare Center and at the health center. lack of availability of Health HR (Nutritionist) in conducting health interventions to the community where there is only one Nutritionist to handle 30 integrated healthcare center in four Kelurahan. However, cross-sectorial cooperation can be established and also empowering integrated healthcare center cadres to conduct health interventions directly to the community.

Mother of children under five who get guidance from cadres will participate well to integrated healthcare center, because there is a sense of recognition and attention given by integrated healthcare center managers so that mothers of toddlers routinely come to integrated healthcare center [11]. Research conducted by Welasasih *et al*. [12] shows that attendance at integrated healthcare center is an indicator of the reach of basic health services for integrated healthcare center including monitoring of growth and growth.

In addition, research conducted by Maharsi [13] shows that knowledge of cadres is one of the keys in the service system at Posyandu, because with cadres who will get a positive response from mothers who have

children under five, it is easy to be adjusted friendly and well organized services. This encourages toddlers to visit the posyandu diligently.

The results showed that the informants received full support from family members who live in the same house; although there was still a perception that immunization could cause side effects such as paralysis. As for the pattern of child care seen from the provision of food intake, other family members have not provided significant support because it still prioritizes what the child wants rather than paying attention to the nutritional content of the food to be provided.

This study is in line with what was done by Yudianti and Saeni [14], which shows a relationship between feeding practices and personal hygiene to stunting, while the practice of personal hygiene related to the incidence of stunting. Other studies that are in line with this study were also conducted by Waroh [15] on toddlers who experience poor nutrition, family support is very important to pay attention to adequate and balanced nutrient density so that the physiological and immunological body of a toddler can return to normal and can increase body weight. Stewart [16] stated that nutrient deficiency or excess in the 0–2 years ago period will generally have an impact on the quality of life of children. Nutritional deficiencies in children under five will eventually cause stunting so that it disrupts the growth and development of infants, while excess nutrition causes obesity.

Family income in residential areas where the majority of community employment is laborers with varying income levels earned per day, per week, or per month. The economic level of most residential communities is at the lower middle level with the largest number of family members of more than seven people in one household. The results showed that most residential communities have additional income in the household. Allocation of daily expenses for childcare and feeding per day ranges from Rp. 30,000 to Rp. 50,000 which is used for the cost of meals per day as a family from morning to night. The community prefers to spend more on snacks than the cost to meet family nutrition intake.

The study conducted by Illahi [17] showed the results of statistical tests that there was a relationship between family income, birth weight of children under five, and length of birth of children under five with stunting in Ujung Piring Village, Bangkalan. Income factor becomes the dominant factor in the occurrence of stunting. A parallel study was conducted by Ngaisyah [18] which showed that in the stunting group, the income was below the UMR of 67 respondents (35.8%), while those who had an income above the UMR were only 45 people (22%).

The results of this study indicate that the way of giving food to children in a day mostly only feed children as much as 1–3 times with food intake that lacks good nutrition for children. Parents sometimes prefer to follow the desire to eat their children who prefer to eat snacks and drink milk instead of eating rice, side dishes, and food. Fulfillment of adequate nutrition, both macronutrition and micronutrition are needed to avoid or reduce the risk of stunting [19].

Another parallel study was also conducted by Welasasih and Wirjatmadi [12] which showed a significant relationship between the types of consumption of children under five with the nutritional status of stunting children in the village of Kembangan with $p = 0.035$ ($p < 0.05$). The types of food consumed in the stunting toddlers group are mostly with a menu composition consisting of staple foods + side dishes + vegetables which is an incomplete daily menu. The type of food consumption greatly determines the nutritional status of a child, said that the food is of good quality if the daily menu provides a nutritious, balanced, and varied menu according to his needs [19], [20], [21].

Eating habit is a human behavior toward a food such as attitude, belief, and selection in consuming food that is obtained repeatedly. Children's nutritional condition is influenced by various factors, which are divided into direct and indirect causes. The immediate cause is the adequacy of food and the state of children's health. Indirect causes are family food security, care for mothers and children, and environmental sanitation [4].

Recommendation

It is hoped that the Regional Government of Sidenreng Rappang Regency will be more strict in applying sanctions for violators of the marriage law in accordance with applicable regulations, and parents or families should equip their children with education to a higher level so that they develop critical thinking patterns and rational, especially in preparing for their marriage.

Conclusion

Based on the results of research and discussion of the reinforcers factor of family-based stunting children parenting in the slums of Makassar City. Hence, it can be concluded that the reinforcers factor consists of support for health services that are already quite good, and family members provide support in child care. While the inhibitors factors consist of uncertain family income for the daily needs of family members, and irregular nutritional food intake is given in a day.

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Knowledge and Understanding of Mental Disorders in Families of People with Mental Disorders

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Abstract

BACKGROUND: Utilization barriers of mental health services are the lack of knowledge about mental health.

AIM: This study aimed to identify the knowledge and understanding of the families of people with mental disorders about mental disorders.

METHODS: This study is a qualitative research with phenomenological approach. Data were obtained by interview, unstructured observation, and documentation on seven informants in Puskesmas Larompong Luwu, South Sulawesi. Content analysis was used to identify topics or categories in the data.

RESULTS: The family of people with mental disorders still has negative views about people with mental disorders. People with mental disorders are often called the term "lunatic," insane, scary, and dangerous. In addition, people with mental disorders regarded as a person who has a disease that makes people uncomfortable because of behavior that is unnatural. Families have an understanding that the causes of mental disorders associated with the occult and mystical or supernatural events. The factors that cause families have minimal understanding of the appropriate handling for people with mental disorders.

CONCLUSION: It was concluded that the knowledge and understanding of mental disorder which is owned by the family of people with mental disorders as the holder of a healing role in supporting people with mental disorders are lacking.

Introduction

Mental health is one of the targets contained in the Sustainable Development Goals, but often overlooked [1], [2]. In fact, mental health is a fundamental component of the definition of health, which is no less important than physical health [3], [4]. Mental disorders consist of a various problems, with various symptoms, but are generally characterized by some abnormal combinations of thoughts, emotions, behavior, and relationships with others [5]. In the context of mental health, there are two terms for individuals who have mental disorders people with psychiatric problems and the mentally ill [6].

Each individual people with psychiatric problems potentially have mental disorders or psychosocial disabilities [7]. Categories of mental disorders assessed in the 2018 Basic Health Research Data known to consist of mental emotional disorder (anxiety and depression) and severe mental disorders (psychoses) include schizophrenia. Other forms of mental disorder are postpartum depression, dementia, and suicide [8].

Anxiety disorders and depression are one of the most common mental health problems in society [9]. Until now, people with severe mental disorders in Indonesia are still deprived and mistreatment.

The proportion of households that had put in a family member with severe mental disorders was 31.5% [10]. Although the government has banned the stocks since 1977, Indonesia is even free from stocks for patients with mental disorders is a priority program that must be achieved by the government in 2019 [11], [12]. Some research suggests that barriers on mental health services are knowledge about mental health is lacking [13], [14], [15], [16], [17]. Society generally identifies people who have psychiatric problems with a "madman," because the symptoms are considered strange and different from normal people, while other mental disorders such as depression, anxiety, and mental disorders that appear in various physical complaints are still poorly known [18].

People with mental disorders will come to primary healthcare because of physical complaints. While untrained health workers often focus only on physical complaints by carrying out various checks and providing drugs to overcome them so that their mental problems are often ignored and treatments becomes ineffective [18], [19].

Based on preliminary studies carried out in the primary health service in Luwu District, South Sulawesi Province in 2018 stated of 353,277 inhabitants there were 470 (0.13%) recorded cases of mental illness including old cases and new cases, mostly a nuisance cases of schizophrenia and psychotic disorders other chronic of these 252 people (53.6%) with psychiatric disorders who come to the health center for treatment.

The highest number of visits was in the Larompong health center, 32 people (78%) came and were recorded at the health center from 41 cases (0.19%) of mental illness. Based on data from the Larompong Health Center, the number of people with mental disorders who visited the Larompong Health Center was increased from the previous year. This is because in Larompong Health Center already have a policy of the health center in an effort to deal with the situation.

Larompong Health Center is a health center that provides mental health services and to this day is currently running well. Therefore, this study aims to identify the knowledge and understanding of the families of people with mental disorders about mental disorders.

Materials and Methods

This research was conducted at the Larompong Health Center Luwu District, South Sulawesi. This type of research is qualitative research with phenomenological approach. Informants in this study were selected by purposive sampling. The informant in this study was people with mental disorders and family of people with mental disorders.

Data collection methods used in this research is in-depth interviews, unstructured observation and document study. Data analysis used in this study is content analysis which is a way to find the meaning of written or visual material by way of systematic content allocation to the detailed categories by simply dividing the data into small parts and then collecting coding in similar and calculated groups.

Results

Until now, the handling of families of people with mental disorders has not been satisfactory. The reason is the ignorance of family-related knowledge about the problem of mental disorders. Whereas, on the other hand, the family has a duty to make decisions appropriate health measures for family members sick with implications for the unfair treatment received by people with mental disorders.

The lack of knowledge and understanding of mental disorders cause sufferers often get unpleasant treatment of community family even patients themselves. The treatments were made by people with mental disorders such as discrimination, isolation, ostracism, and even up stocks. The family even considered a mental disorder is a disgrace that they hide the state of the mental disorder of society.

Negative views about people with mental disorders

People with mental disorders are often seen layman as a strange thing and they casually labeled “lunatic” on people with mental disorders. Besides labeled “lunatic,” sequestered away from the people they love, people with mental disorders are also often subjected to inhuman treatment.

The views informant against people with mental disorders is generally negative. Some informants revealed that people suffering from mental disorders are a “madman” and insanity. ODGJ also considered frequent tantrums and carrying weapons so that they feel fear when meeting with ODGJ. The following statement of the informant:

> *“Crazy people, usually likes to get angry and raged. When I see them on the street, I’m afraid”*
> (MT, 31 Years, Family ODGJ)
> *“What often carry machetes, do not wear clothes like wandering, just insane”*
> (MB, 60 Years, Family ODGJ)

Another informant expressed his views that people with mental disorders was dangerous, could hurt themselves and others.

> *“The disease makes people lose their minds to do a behavior that can be dangerous. If there are things that make him angry, can run amok and to carry a machete, it could hurt themselves and others”*
> (SM, 41 Years, Family ODGJ)

Not much different views expressed by other informants that ODGJ is a person who has a disease that makes people uncomfortable because of complaints that do unnatural behavior.

> *“Love alone, when talking with dirty language, his clothes in tatters even do not wear clothes, like collecting used plastic. The interface is not maintained even lazy bath”*
> (HJ, 56 Years, Family ODGJ)

No proper understanding of the causes of mental disorders

ODGJ alienating attitude because there is a stigma that the “madness” they caused their belief that these conditions occur because possessed by a demon,

or because of the sins committed parents, or because ever immoral practices. The existence of this poor outlook, the family that owns ODGJ tends to feel ashamed and try to hide ODGJ of interaction with others. Especially when it happens in families who live in remote areas with low education levels, stocks ended up being the final solution when the shaman or healer could not change the situation.

Interviews showed some informants have an understanding that the causes of mental disorders associated with the occult and mystical or supernatural events. As the informant the following statement:

> *"If older people antiquity said that he received the knowledge of the ancestors to be able to treat other people. But he was unable to accept the science"*
> (LH, 52 Years, Family ODGJ)
> *"It seems as there are female friend who sent witchcraft so that my sister sick like that"*
> (SM, 41 Years, Family ODGJ)

Another informant said that the expression of mental disorders occurs because there are vows of parents who are not satisfied. The following statement of the informant:

> *"He and his brother suffered from such diseases. Usually, the symptoms will appear when they go wandering, crossing oceans. It seems her parents have first-nazar nazar which is not implemented, so that children suffering from this disease"*
> (HJ, 56 Years, Family ODGJ)

Minimum understanding regarding proper handling for people with mental disorders

Disturbingly, due to lack of knowledge about mental disorder so as to cope with mental disorders are usually taken for treatment to a shaman, healer, or even religious leaders to pray for. The results of interviews conducted is known that when experiencing symptoms of psychosis brought some people with mental disorders go to traditional healers, teachers, and the treatment of the supernatural.

> *"Time began to frequent tantrums, I take to go to traditional healers, but he says this is not a cure. After that I bring to Ustadz for rukiyah but he says this is not a cure"*
> (LH, 52 Years, Family ODGJ)
> *"Once I brought to the treatment of the supernatural as I think he's like that because of witchcraft"*
> (SM, 41 Years, Family ODGJ)
> *"Delivered treatment to some Ustadz, in rukiyah, but not cured"*
> (MT, 31 Years, Family ODGJ)

Lack of knowledge about family psychiatric disorder led to a lack of understanding about the family of the symptoms of mental disorders. Families cannot distinguish the symptoms of mental disorders with physical symptoms that are similar. This led to the treatment of people with mental disorders are not exactly the case.

A person with a mental disorder has symptoms start showing symptoms of epilepsy. ODGJ often suffer from seizures that families consider as epilepsy, this causes the patient does not get proper treatment.

> *"Went to the doctor practice, a neurologist. The clerk at the health center told me he had to go to specialists life, my child epilepsy is not crazy. To what doctor to the soul?"*
> (MB, 60 Years, Family ODGJ)

Discussion

These results indicate that the lack of knowledge about mental disorder causing the patient and the family does not know and does not realize that he suffered a mental disorder. Lack of knowledge about mental disorders are caused by the lack of information received by people with mental disorders and family. This ignorance became dominant enough strength inhibitors that affect people with mental disorders that do not utilize mental health services in health centers.

One's knowledge will determine how they behave, as mentioned by Bloom in Notoatmojo (2007) knowledge is sensed or results to know a person against an object. Knowledge is most closely associated with the behavior.

Knowledge is the impression of the human mind as a result of the five senses. Knowledge about health is very important before health actions take place, but the health action may not occur if someone gains knowledge in advance [20]. In the use of health services, a person's behavior is influenced by the form of knowledge.

A person tends to be no use of health-care services due to the trust and confidence that health services cannot cure the disease, and vice versa [21], [22]. Knowledge of mental health can affect people's behavior in the utilization of mental health services in health centers. Knowledge is very important role because with the knowledge society will be formed stance, will be followed by action selecting a good health service [23].

The results are consistent with research conducted by Brown [14] and Ali [16] which revealed that knowledge of poor mental health is one of the barriers for people with mental disorders to access mental healthcare. The level of knowledge about mental health is known as mental health literacy is defined as the knowledge and understanding of mental disorders to identify, manage, and prevent it.

A person may seek treatment for themselves or another person optimally. The important thing was first required is able to recognize the symptoms of the disease, determine the cause, knowing the type of treatment, and knowing where medical facilities capable of providing no exception to the treatment of mental disorders [24].

These results indicate that the outlook for people living with mental disorders is generally negative. Some informants still refer to people with mental disorders as "lunatics," insane, scary, and dangerous. While other views provide a definition of people with mental disorders as people who have a disease that makes people uncomfortable because of complaints that do unnatural behavior.

These conditions explain that there are still some families who gave a negative stigma to provide special labels. People with mental disorders are still regarded as an embarrassment or a disgrace to the family or relatives of a family member experiencing a mental disorder to deserve excommunication.

The lack of knowledge about mental disorders make judgments given to people with mental disorders that they are different people with physical illness that can be cured so that labeled as "strange." This has led to the treatment and the wrong attitude toward people with mental disorders.

In contrast to physical health problems (body), which are easily recognizable by the public, the introduction of mental disorders more difficult to grasp. Besides, because of its abstract as well as still very much in terms of mental health is not known. Knowledge of mental health in the community is often overlooked [23].

There are several issues related to the lack of knowledge that the family is usually too late to recognize the early symptoms of the mental disorder. The family will do the search for drugs when the patient has begun to disrupt the activities of the family or the people around him. Some people believe that mental disorders are the result of bad choices.

In studies, Wardhani [25] and Colucci [26] stated that mental disorders occur due to supernatural causes and some are believed due to the offspring of parents or close relatives. The results are consistent with the previous studies that found that the emergence of health problems with symptoms that abstract regarded as something beyond reason (irrational). Everything that is outside of reason in society is regarded as a related to the occult and mystical or supernatural events.

This factor is the main driving force for families to seek treatment efforts using traditional medicine and go to traditional healers, Ustadz or supernatural treatment because it is considered the problem is not a doctor working area [27]. When families do not have enough knowledge about the pain experienced by the patient, they will be looking for information about a place that can cure patients to others [18], [19], [28].

Less familiar terms in mental disorders allows health workers cannot or misidentified their mental disorders in patients. Family cannot tell any complaints or symptoms are in good health providers. Family role in helping the diagnosis is very important because often patients themselves cannot recognize complaints of the [28].

Lack of understanding of the family will be the early symptoms because the family cannot distinguish the symptoms of mental disorders with symptoms of other physical ailments. Besides the lack of good communication between doctor and patient family related health symptoms of the disease makes improper handling occur [29], [30].

This study found that the people with mental disorders who have symptoms start showing symptoms of epilepsy, the seizures so frequently misdiagnosed as epilepsy. In the next development for handling initial treatment for the disease is not maximal, exacerbating the psychological condition of the patient.

People with mental disorders may not be able to overcome their own mental problems. Tesebut individual takes the role of other people around, especially families. Knowledge and information about mental disorders should be known by the whole of society, ranging from the causes of mental disorder to determine the appropriate treatment for them to be able to recover.

Recommendation

Knowledge and understanding of mental disorder which is owned by the family of people with mental disorders as caregiver who plays a role in supporting the healing of patients are still lacking. Family outlook generally still refer people with mental disorders as "lunatics," insane, scary, and dangerous.

Families also understand that mental disorders result from the occult and mystical or supernatural events. These factors encourage the family to seek treatment efforts using traditional medicine, religious leaders, or the treatment of the supernatural. Public health center and health workers advised to improve the provision of information and health education through counseling and mental health promotion to family of people with mental disorders and community programmed to improve mental health services.

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Smoking Characteristics on Junior High School Students: A Cross-Sectional Study

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Abstract

BACKGROUNG: The age of new smokers has shifted to a younger age group. Smoking has become a trend among teenagers.

AIM: The purpose of this study was to obtain a description of the characteristics of junior high school teenagers with smoking habit.

METHODS: This research was a survey with cross-sectional observational study design. Respondents were male and female students in two public Junior High Schools in Makassar City, Indonesia. 1062 students were chosen, 473 were male students and 589 were female students. Data were collected using structured questionnaires. Univariate analysis was conducted to see the characteristics of respondents.

RESULTS: The results showed 18.4% respondents never smoked with details of 39.4% male students and 1.5% female students. Students who ever smoked, as many as 26.7% are still smoking until currently with details of 28% male students and 1.5% female. As many as 11.3% of students had low knowledge about smoking, 27.8% interacted with peers who smokes, 17.3% lived with parents who smokes, and 18.8% interacted with tobacco advertising.

CONCLUSIONS: Teen smokers have the potential to become long-term smokers. The high number of teenage smokers will worsen the public health situation. Therefore, health promotion for prevention and intervention of smoking behavior in schools needs to be done intensively.

Introduction

The use of Tobacco can effect the cause of preventable death according to the Department of Health and Human Service US [1]. The World Health Organization and Oxford University imply that every secondary smoker would die prematurely due to smoking [2].

Every year, more than 217,000 people die in Indonesia due to diseases caused by cigarettes [3]. Smoking behavior has spread to almost all age groups and has now become a trend in teenage age groups. Smoking was considered could lower the stress, anxiety, and depression [4].

Results of Riskesdas (Basic Health Research) in 2013 shown that as many as 1.4% of smokers in Indonesia are at the age of 10–14 years. By habit, 0.5% teenagers are smoking every day and 0.9% of them are smoking occasionally [5].

Teenagers are a vulnerable age group and have the potential to become long-term smokers. Long-term smokers are at risk of facing up to 3 times higher deaths than nonsmokers [6]. Smoking behavior, not only as a risky behavior, but it can also be a bridge for teenagers to start trying alcoholic beverages, narcotics, psychotropic, and other addictive substances.

Personal, socio-cultural, and environmental are some factors for young people to smoke [7], [8]. The supportive numbers of father and child conversations, maternal smoking, and spending time with peers are significantly related with smoking risk experimentation on early teenagers [9].

However, teenagers tend to break away from parents and spend time interacting with their peers [10]. A study of 178 elementary school students in Bandar Lampung shows that there is a relationship of peer's role to smoking behavior. More than 50% of students have bad peers, and as many as 64 of them, have smoked. There are only five students who have good peers, yet have smoked [11].

Research on the description of smoking behavior in teenagers in Bantul District conducted to 188 junior high school students stated that respondents who started smoking at the age of 11, 12, and 13 mostly

came from families with smoking father and male brother [12]. Another study of 471 junior high school students from 13 junior high schools in Makassar showed that there was a relationship between peer group, family, cigarette advertisement, and attitudes toward teens smoking behavior [13].

Materials and Methods

Data and subjects

This study is a preliminary study (baseline) for the study of intervention in junior high school students. The research data were collected in two public junior high schools in Makassar City, South Sulawesi, Indonesia. This research was an observational study with survey method. The number of samples was 1062 people who were students in the 7th and 8th grades of junior high school. Primary data were obtained through a structured questionnaire list that was distributed to all male and female students present at the time of data collection.

Measurement

To investigate smoking characteristic, a standardized interview questionnaire was used. The questionnaire used has been tested on its validity and reliability in the same population in different public schools. The smoking characteristic was include history of smoking, sex, grades, level of knowledge, smoking behavior based on family environments, and interaction with peers. Data collection was done after obtaining permission from the school principal. Respondents signed the informed consent after receiving explanation about the research. Respondents were arranged in such a way that the information obtained reflects the true state of the student. Data analysis was done descriptively to know the frequency distribution of variables studied.

Statistical analysis

To determine the differences knowledge and attitudes based on grades and sex, Chi-square test was used for this analysis. Statistical analyses were conducted with SPSS version 20.0 and $p < 0.05$ indicated statistical significance.

Results

Characteristics of respondents

Respondents consisted of 473 male students and 589 female students, with age ranging from of 11 to 16 years old. Respondents characteristic are presented in Table 1.

Table 1: Characteristics of respondents

Characteristics of respondents	Total (n)	Percentage
Origin of school		
SMPN 37 Galangan Kapal	445	41.9
SMPN 25 Sudiang	617	58.1
Grade		
7th grade	549	51.7
8th grade	513	48.3
Sex		
Male	473	44.5
Female	589	55.5
Level of knowledge		
Low	53	5.0
Average	490	46.1
High	519	48.9
History of Smoking		
Have smoked	195	18.4
Have never smoked	867	81.6

Smoking history

The distribution of smoking history of respondents by sex is clearly shown in Table 2. Of the total respondents, 18.4% of the respondents claimed to have smoked, with nine people of them (1.5%) are female, and 186 of them (39.4%) are male.

Table 2: Distribution of respondents' smoking history by sex

Sex	History of smoking				Total	
	Have smoked		Have never smoked			
	n	%	n	%	n	%
Male	186	39.3	287	60.7	473	100
Female	9	1.5	580	98.5	589	100
Total	195	18.4	867	81.6	1062	100

The distribution of respondents' smoking history based on the level of knowledge is clearly illustrated in Table 3. There were 19.3% of respondents who had smoked and had moderate knowledge level and 18.3% had high knowledge.

Table 3: Description of smoking history based on knowledge level

Level of knowledge	History of smoking				Total	
	Have smoked		Have never smoked			
	n	%	n	%	n	%
Low	6	11.3	47	88.7	53	100
Average	94	19.3	394	80.7	488	100
High	95	18.3	423	81.7	518	100
Total	195	18.4	864	81.6	1059	100

Smoking behavior

Of the 18.4% of respondents who ever smoked, there are 26.7% of them who are still smoking and all are male respondents. The distribution of respondents based on smoking behavior is presented in Table 4.

Description of respondents' smoking behavior based on the level of knowledge is presented in Table 4. The majority of respondents who are still smoking have low knowledge about cigarettes (33.3%).

The description of respondents' smoking behavior based on interactions in the family environment is presented in Table 5. Respondents who smoke more and lived in the same household with smoking relatives (28.2%) are more frequent than those who do not have relatives that smoke. In addition, respondents who

Table 4: Distribution of respondents based on smoking behavior

Sex	Smoking behavior				Total	
	Yes		No			
	n	%	n	%	n	%
Male	52	28.0	134	72.0	186	100
Female	0	0.0	9	100.0	9	100
Total	52	26.7	143	73.3	195	100

smoke more often find their families smoking (27.5%) and often find cigarettes at home (28.3%).

Table 5: Distribution of respondents' smoking behavior based on knowledge level

Level of knowledge	Smoking behavior				Total	
	Yes		No			
	n	%	n	%	n	%
Low	2	33.3	4	66.7	6	100
Average	27	28.7	67	71.3	94	100
High	23	24.2	72	75.8	95	100
Total	52	26.7	143	73.3	195	100

Distribution of respondents' smoking behavior based on interaction with peers is presented in Table 6. The majority of respondents who smoke have close friends that smoke (30.7%) compared to those who do not have close friends that smoke. In addition, respondents who smoke admitted that they are often invited by friends to smoke (35.2%) and often given cigarettes by their friends (35.0%). More smoking respondents claimed to have been forced by friends to smoke (27.8%) than those who have never smoked.

Table 6: Distribution of respondents' smoking behavior based on interaction within the family environment

Interactions in the family environment	Smoking behavior				Total	
	Yes		No			
	n	%	n	%	n	%
Live in the same house with relatives that smokes						
Yes	29	28.2	74	71.8	103	100
No	23	25.0	69	75.0	92	100
Often find relatives smoking						
Yes	30	27.5	79	72.5	109	100
No	22	25.6	64	74.4	86	100
Often find cigarettes at home						
Yes	32	28.3	81	71.7	113	100
No	20	24.4	62	75.6	82	100
Total	52	26.7	143	73.3	195	100

Distribution of respondents' smoking behavior based on interaction with cigarette advertisement is presented in Table 7. Respondents who smoke more often paid attention to cigarette advertisement (28.3%) compared to those who did not pay attention to cigarette advertisement. Respondents who smoke also claimed to be more interested in images shown in cigarette advertisements (44.0%) and are moved to try smoking like how it is shown in ads (75.0%). In addition,

Table 7: Distribution of respondents' smoking behavior based on interaction with peers

Interactions with peers	Smoking behavior				Total	
	Yes		No			
	n	%	n	%	n	%
Have close friends that smoke						
Yes	50	30.7	113	69.3	163	100
No	2	5.2	30	93.8	32	100
Invited by friends to smoke						
Have	43	35.2	79	64.8	122	100
Never have	9	12.3	64	87.7	73	100
Given a cigarette by friends						
Have	36	35.0	67	65.0	103	100
Never have	16	17.4	76	82.6	92	100
Forced by friends to smoke						
Have	10	27.8	26	72.2	36	100
Never have	42	26.4	117	73.6	159	100
Total	52	26.7	143	73.3	195	100

Table 8: Distribution of respondents' smoking behavior based on interaction with cigarette advertisements

Interaction with cigarette advertisements	Smoking behavior				Total	
	Yes		No			
	n	%	n	%	n	%
Paid attention to cigarette ads						
Yes	28	28.3	71	71.7	99	100
No	24	25.0	72	75.0	96	100
Interested with images shown in cigarette ads						
Yes	11	44.0	14	56.0	25	100
No	41	24.1	129	75.9	170	100
Interested with messages in cigarette ads						
Yes	16	25.0	48	75.0	64	100
No	36	27.5	95	72.5	131	100
Moved to try smoking like how it is shown in cigarette ads						
Yes	21	75.0	7	25.0	28	100
No	31	18.6	136	81.4	167	100
Total	52	26.7	143	73.3	195	100

the respondents who smoke more did not pay attention to the message in cigarette advertisement (27.5%) compared to those who pay attention to the message on cigarette advertisement (Table 8).

Bivariate analysis of knowledge and attitude

Difference in respondents' knowledge and attitude based on grade and gender is presented in Table 9. The average score of knowledge in 7th grade is 13.29 and 8th grade is 13.50, the statistical test obtained p (0.228)> 0.05, which means there is no difference in the average knowledge score between 7th grade and 8th grade. While the average attitude score in 7th grade is 91.84 and 8th grade is 94.42, the statistical test obtained p (0.002) <0.05, which means that there is a differences in the average attitude score between 7th grade and 8th grade.

Table 9: Differences in respondents knowledge and attitudes based on grade and gender

Characteristics of respondents	Knowledge			Attitude		
	Mean	SD	p-value	Mean	SD	p-value
Grade						
7th grade	13.29	2.41	0.228	91.84	12.09	0.002
8th grade	13.50	2.47		94.42	10.90	
Sex						
Male	13.16	2.53	0.028	89.13	12.75	0.000
Female	13.55	2.38		95.78	9.89	

Independent t-test

Based on the gender category, the average score of knowledge of male respondents is 13.16 and female is 13.55, the statistical test results obtained p (0.028) < 0.05 which means that there is a difference in the knowledge score between male and female. While the average attitude score, which male is 89.13 and female is 95.78, the statistical test results obtained p (0.000) < 0.05 which means there is a difference in the average attitude score between male and female.

Table 10 shows the bivariate analysis of age associated with knowledge and attitude. Bivariate analysis for age and knowledge obtained p (0.423)> 0.05 which means there is a relationship between age and knowledge while the relationship between age and attitude obtained p (0.243)> 0.05 which means there is no relationship between age and attitude.

Table 10: Bivariate analysis of age associated with knowledge and attitude

Variable	Mean	SD	p-value	r-value
Correlation between age and knowledge				
Age	13.37	0.79	0.423	0.028
Knowledge	13.40	2.44		
Correlation between age and attitude				
Age	13.37	0.79	0.243	-0.041
Attitude	93.13	11.58		

Pearson correlation

Discussion

Smoking is one of the risk factors of various diseases which effects are felt only after few years later. Smokers who start at a young age will bear a greater risk. The impact is not only on their physical health but also on individual development [14]. Moreover, teenagers are a vulnerable age group and have the potential to become long-term smokers. Smoking at an early age also provides greater opportunities for other deviant behaviors as it can be start to start marijuana and narcotics [15].

The result of this study shows the respondents that claimed to have smoked most of them are male (39.4%). It is in line with research in South Korea that from 17.8% students of 13–15 years old in Korea had ever smoked cigarettes, 25.1% are boys and 9.9% are girls [16].

Based on history of smoking, in this study, there are still 18.3% of respondents who had high knowledge have smoked in past. Most frequently cited reason for tobacco use is, "smoking is an easy way to approach another person," cause declining the offers of cigarette from others as being unfriendly. Those who have this perception are more likely to be smokers in future [2].

Becoming a regular smoker has been shown to be a process rather than a single event [8]. Knowledge is one of the factors related to smoking behavior. The results of this study indicate that the majority of respondents who are still smoking have low knowledge about cigarettes (33.3%). The results also fit the theory that those who have knowledge and understand the high dangers of smoking or have more knowledge will have a low smoking behavior, in the sense that the level of dependence on cigarettes is low [17]. This can be the basis for behavioral change attempts, thus a strategy that can be used is to enlarge the cognitive-intellectual information on the subject.

The family is the smallest social unit that provides the primary foundation for child development. The research found that 17.3% of respondents who smoke live with parents or family members who are also smoke. This finding shown that family influence children behaviors. A study in 2016 addressed that family factors could affect adolescents' decision on smoking [4]. Family is the closest environment for teenagers. The results of this study indicate that the respondents who smoke the majority have family members who smoke and live with relatives who smoke. This result is accordance to a study result which was conducted in Kuwait; respondents in this research stated that one of the reason teenagers started smoking was because they have family members who smoked [4], [18]. Another study to test whether parent-specific interactions were significantly associated with the onset of smoking experimentation in early teen found that the supportive number of conversation between father and child conversations was consistently associated with a declined risk of across all models experimentation. These findings recommend that family could be a major factor in the arranging health related with teenagers' behaviors [9].

Furthermore, this result is also strengthened by a study in 2000; "Children residing with smokers were 3 times as likely to be currently smoking; 4 times as likely to be frequently smoking, 2 times as likely to have friends who smoke; and 4 times as likely to say they started smoking because family members smoked" [18]. It means, the surrounding environment and school participation give nuances to the development of children. Because of this, the good and bad of the family structure and the surrounding community influence the good or bad growth of the child's personality [19].

The development of the child's personality is not only influenced by parents and family but also by the school environment and friends outside the school [11]. The child will begin to withdraw his interaction with the parent's environment to develop new values. The formation of new values is done by the identification, imitation of certain figures, and by developing their own.

In several level of smoking, illustrated as an involving friendship and condiment of social activity in making new friends and develop relationships in easy way. Offering cigarettes between each others means as an interaction of social and a friendly gesture. Meanwhile, the beggar to reach acceptance from peers applying implied pressure and effect also promotes smoking or smoking attack [2].

The results are shown more respondents who smoke had close friends or peers who smoke as well. The results of this study are in line with research conducted in China that having peers who smoked was a dominant independent as contributor to youth smoking. Study conducted by Rozi *et al*. 2016 in Pakistan also shows that peers and families who smoke affect the increasing number of teenage smokers in Pakistan up to 20% [20]. This suggests that having a smoking friend turned out to be the most important predictor of teen smoking. According to a study conducted in Indonesia, there is a relationship between peer pressure and smoking behavior among elementary school students [21].

Peers have an influence in giving information about cigarettes verbally and also becoming role models for informants. As teenagers, peer relationships

become much stronger than the family that teens are more affected by the behavior of their friends. In relationships with peers, the need to be part of a social group is a major goal. Individuals tend to follow everything that is done by peers so that they seem to have the same values and behavior. There is a fear of losing social groups if they do not follow what is trending in the group. Therefore, it is very important to make an effort to change the behavior of teens smoking early by using the nearest environment, that is, peers.

Another factor that became one of the characteristics of teen smoking behavior is cigarette advertising. Cigarette advertising as a promotional medium for cigarettes and various types has the potential to shape teenagers smoking attitudes and behavior [13]. Media impressions showing teen idol figures smoking cigarettes will encourage teens to follow suit [22]. The results showed that respondents who smoke were attracted to cigarette advertisement images and were moved to try smoking like an advertisement. This is in line with research conducted by Kustanti in 2014 that there is a relationship between smoking behavior of respondents (32.4%) with the influence of cigarette advertising [23]. Viewing advertisements in mass media and electronics that display an image of smokers as a symbol of virility or glamor makes a person triggered to imitate the behavior in the cigarette advertisement [24].

The result on this study found that there is a difference in knowledge between two genders ($p = 0.028$), where the average score of females (13.16) has better than males (13.55) but there is no difference in average score of knowledge between 7th grade and 8th grade ($p = 0.228$). While for attitude on smoking behavior in teenagers, there is a difference in attitude between genders and between grades (all $p < 0.05$). This study also found that age is associated with knowledge and attitude (all $p < 0.05$).

A study in India also found a similar result that there is a difference in knowledge among all genders. However, males had significantly better knowledge compared to females ($p = 0.006$) and the knowledge score did not improve with the increasing grades. It is also in line with research in Botswana that found tobacco smoking significantly higher among senior students as opposed to those in junior secondary school levels [25]. Another study found that there is an association between general characteristics and scores on attitudes toward smoking among young military conscripts in Taiwan. The overall attitude toward smoking was significantly associated with age and education level (all $p < 0.05$). Older subjects had higher scores than younger subjects, and subjects with higher levels of education had higher scores than less educated subjects [26]. In this study, males in younger grade with the low knowledge and low attitude are a vulnerable group and have potential to become long-term smokers.

Conclusions

Based on finding of this study, we can conclude that interaction within the family, peers, and advertisement could affect teenagers' smoking behavior. The knowledge and attitude between genders, grades, and ages are also influence teenagers smoking behavior. Comprehensive strategy needs to prevent adolescent from taking up these habits in the future.

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Influence of Patient Experience and Hospital Image on Patient Loyalty in Meloy Public Hospital of Sangatta, East Kutai Regency

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Abstract

BACKGROUND: Patient experience is an indicator in measuring the quality of service by placing patients as the center of service in the hospital.

AIM: This study aimed to analyze the effect of patient experience and hospital image on patient loyalty, as well as the influence of patient experience and hospital image on patient loyalty through patient satisfaction variables in Meloy Public Hospital of Sangatta.

METHODS: The design of this study was analytic observational design with cross-sectional study approach. This research was conducted at Meloy Public Hospital of Sangatta, East Kutai Regency since May to July 2019. The sample of this study was 110 respondents. The samples were taken in each treatment class at hospital by proportional stratified random sampling. In this study we used a questionnaire and univariate, bivariate, and multivariate analysis using path analysis.

RESULTS: Patient experience affected patient satisfaction, hospital image affected patient satisfaction, patient experience did not directly influence patient loyalty, hospital image directly affected patient loyalty, and patient experience and hospital image indirectly affected loyalty patient through patient satisfaction. To the Meloy Public Hospital of Sangatta to maintain the good image of the hospital in providing services to the patient experience is memorable so that the desire arises to reuse hospital services in the future.

CONCLUSION: Based on research on the Influence of Patient Experience and Hospital Image on Patient Loyalty in Meloy Public Hospital of Sangatta, East Kutai Regency, researchers formulated the following conclusions: Patient experience influences patient satisfaction at the hospital. The image of the hospital has an effect on patient satisfaction at the hospital. Patient experience does not directly affect patient loyalty in the hospital. The image of the hospital has a direct effect on patient loyalty at the hospital. Patient experience and hospital image have an indirect effect on patient loyalty through patient satisfaction at the hospital.

Introduction

The hospital is a health service business, one of which is based on the principle of trust obtained from the patient's experience as well as from the hospital's image, so the problem of service quality, patient satisfaction that has an impact on patient loyalty is a very determining factor for its success. In the health sector, patient experience is an indicator in measuring service quality by placing patients at the center of service in hospitals [1].

Several other studies linking customer experience with loyalty, namely, Gentile [2] show that experience in identifying customer choices plays a fundamental role, and then influences purchasing decisions. Chang [3] show that experience is an important variable in understanding consumer behavior and repurchase. The results of the Biedenbach [4] study also showed that customer experience is directly proportional to brand loyalty.

East Kutai Regency has a number of public and special hospitals as well as government and private ownership, two regional public hospitals are in Sangatta with Class B and in Sangkulirang with Class D, three private public hospitals are located in Sangatta with Class D, and mother and child hospital is two located in Sangatta with Class C [5].

Based on preliminary data collection on three private public Class D hospitals in Sangatta, East Kutai Regency, namely, Meloy Public Hospital, Medika Hospital, and Pupuk Kaltim Prima Sangatta Hospital regarding the number of inpatient visits in 2016–2018, namely, Meloy Public Hospital in the amount of 3037 (2016), 3220 (2017), and 2936 (2018). The number of inpatient visits to Medika Hospital is 75 (2016), 3838 (2017), and 4927 (2018). While the number of inpatient visits to Pupuk Kaltim Prima Hospital is 2307 (2016), 2304 (2017), and 4599 (2018) [6], [7], [8].

Based on the things mentioned above, there is a problem in the decrease in the number of inpatient

visits at Meloy Public Hospital compared to Medika Hospital and Pupuk Kaltim Prima Hospital. This makes researchers interested in examining the problem of reducing the number of inpatient visits at Meloy Public Hospital.

Following are the results of inpatient satisfaction surveys at Meloy Public Hospital, in 2016 an average of 79.25% in patient satisfaction was obtained, in 2017 an average of 78.28% in patient satisfaction was obtained, while in 2018 it was obtained that the average inpatient satisfaction was 76.17% [6].

To measure the quality of services that are more meaningful then a measurement of patient experience is carried out. This is as stated by Jenkinson [9] that measuring patient experience provides a more meaningful indication of the quality of service received than measuring patient satisfaction.

Harrison [9], [10] states that patient experience is the various interactions that patients have with the health-care system, including their care from the health plan, from doctors, nurses, and hospital staff, doctors' practices, and other health-care facilities.

Based on the survey data of inpatient satisfaction in the past 3 years at Meloy Public Hospital that was mentioned previously shows a decrease in patient satisfaction and overall inpatient satisfaction has not reached the standard ≥90% by ministry of health. This indicates that the quality of inpatient services at Meloy Public Hospital is not yet in line with hospital minimum service standards.

Based on the results of preliminary research show a decrease in the number of inpatient visits and a decrease in patient satisfaction and do not meet the standards of inpatient satisfaction according to hospital minimum service standards, an explanation from experts, the researchers are interested in conducting research on "The Influence of Patient Experiences and Hospital Image on Patient Loyalty at Meloy Public Hospital of Sangatta, East Kutai Regency with the aim of analyzing the influence of patient experience and hospital image on patient loyalty, as well as the influence of patient experience and hospital image on patient loyalty through patient satisfaction variables at Meloy Public Hospital of Sangatta, East Kutai Regency."

Materials and Methods

This research was conducted from May to July 2019 at Meloy Public Hospital of Sangatta. The type of research used was quantitative research, using Time Horizon One Shoot or Cross-Sectional.

The population in this study was all patients who did or had been hospitalized at Meloy Public Hospital of Sangatta regardless of sex. The sample of this study was 110 people. The sampling technique in this study was purposive sampling, where the sample was selected based on certain criteria which had been previously determined by the researcher before.

Data collection instruments in this study were questionnaires, regarding the independent variables in the form of patient experience and hospital image while the dependent variable was patient loyalty with patient satisfaction as a mediating variable.

Measurements used in data processing use a Likert scale, where respondents state the level of agreement or disagreement regarding various objects regarding the behavior of objects, people, or events. Likert scale is used to measure the attitudes, opinions, and perceptions of a person or group of people about social phenomena. In this study, respondents chose one of the available answers, and then the answers were given a specific score. Respondent's scores are then added up and this number is given a specific score.

The data analysis technique used is univariate analysis bivariate, multivariate analysis. Univariate analysis describes each variable used in the study and the characteristics of the respondents, namely, by looking at the description of the frequency distribution and the single percentage related to the research objectives. Bivariate analysis was carried out to find out the relationship between dependent and independent variables in the form of cross tabulation, to see the relationship between the independent and dependent variables. Multivariate analysis with path analysis is a technique for analyzing cause and effect relationships that occur in multiple regressions if the independent variables affect the dependent variable not only directly but also indirectly.

Results

Table 1 shows the correlation between patient experience and patient satisfaction obtained p (0.000) < 0.05 which means there is an influence between patient experience with patient satisfaction with a correlation of 0.631 which is in the category of strong correlation.

Table 1: Influence and relationship between research variables at Meloy Public Hospital in 2019

Variable		p value	r value
Patient experience	Patient satisfaction	0.000*	0.631
Hospital image	Patient satisfaction	0.000*	0.610
Patient experience	Patient loyalty	0.146	0.139
Hospital image	Patient loyalty	0.000*	0.341
Patient satisfaction	Patient loyalty	0.000*	0.713

*Significant with p<0.005

Correlation between hospital image with patient satisfaction obtained p (0.0) < 0.05 which means that there is an influence between hospital image with patient satisfaction with a correlation magnitude of 0.610 which is in the category of strong correlation.

Correlation between patient experience and patient loyalty obtained p (0.146) > 0.05 which means there is no influence between patient experiences with patient loyalty with a correlation of 0.139 which is in the very weak correlation category.

Correlation between hospital image and patient loyalty obtained p (0.000) < 0.05 which means that there is an influence between hospital image with patient loyalty with a correlation of 0.341 which is in the weak correlation category.

Table 2 shows the total effect of the results of the path analysis, the results obtained total combination of hospital image variables on patient loyalty through patient satisfaction has the greatest weight value that is equal to 0.599 while the results of the combination of patient experience on patient loyalty through patient satisfaction has a weight value of 0.283. This means that the patient's loyalty through the image of the hospital influences both directly and indirectly.

Table 2: Effect of total research variables at Meloy Public Hospital in 2019

Variable Combination		Calculation	Result
Patient experience →	Patient loyalty through patient satisfaction	(0.223) + (0.060)	0.283
Hospital image →	Patient loyalty through patient satisfaction	(0.338) + (0.261)	0.599

The results obtained in Table 3 that the frequency distribution of respondents based on the patient experience variable in the 2019 Meloy Public Hospital has a perception in the good category that is equal to 79.1%. Respondents' perceptions of the hospital image are categorized as good at 85.5%. Respondents' perceptions of patient satisfaction were categorized as satisfied, namely, 80.9%. Respondents' perceptions of patient loyalty are categorized as loyal, which is 81.8%.

Table 3: Frequency distribution of respondents based on research variables at Meloy Public Hospital in 2019

Research variable	Frequency (n)	Percentage (%)
Patient experience		
a. Good	87	79.1
b. Poorly	23	20.9
Hospital image		
a. Good	94	85.5
b. Poorly	16	14.5
Patient satisfaction		
a. Satisfied	89	80.9
b. Less Satisfied	21	19.1
Patient loyalty		
a. Loyal	90	81.8
b. Less Loyal	20	18.2

Based on the research that has been done, it is known that the characteristics of the respondents are seen in Table 4, the age of the respondents is mostly in the range of 26–35 years which is 30%. Based on gender characteristics, most respondents were women with male distribution of 37.3% and women at 62.7%. Based on the education level of the respondents, the most high school education is 70%. Based on the respondent's profession, most private employees amounted to 65.5%. Based on the income of the respondents, most of them earned >Rp. 5,000,000 in the amount of 71.8%. Based on the location of the respondent's residence, it is dominated in Sangatta City at 75.5%. Based on the funding sources of respondents showed that the majority of respondents were covered by company guarantees/private insurance which is equal to 63.6% Based on the distance from the respondent's house to the hospital, with a distance of km 5 km, it is equal to 69.1%. Based on the length of treatment, showed in the majority of respondents, treated for 2 days amounted to 57.3%. Based on the number of hospital visits, the majority of respondents were more than once, amounting to 85.5%.

Table 4: Characteristics of respondents Meloy Public Hospital in 2019

Characteristics	Frequency	
	n	Percentage
Age		
17–25	24	21.8
26–35	33	30.0
36–45	17	15.5
46–55	14	12.7
56–65	13	11.8
>65	9	8.2
Gender		
Male	41	37.3
Female	69	62.7
Education level		
Senior High School	77	70
Associate Degree	23	20.9
Bachelor Degree	10	9.1
Occupation		
Jobless	8	7.3
Private Employee	72	65.5
Civil Servant	13	11.8
Student/University Student	10	9.1
Entrepreneur	7	6.4
Income		
No Income	18	16.4
Rp 1.500.000 - Rp 2.000.000	0	0
Rp 2.000.000 - Rp 2.500.000	0	0
Rp 2.500.000 - Rp 5.000.000	13	11.8
> Rp 5.000.000	79	71.8
Residence Location		
In Sangatta	83	75.5
Out of the city of Sangatta	27	24.5
Funding Source		
Direct Cost	14	12.7
Independent National Health Insurance	18	16.4
Dependent National Health Insurance	8	7.3
Company Guarantees/Private Health Insurance	70	63.6
Distance from Home to Hospital		
< 5 km	76	69.1
> 5 km	43	30.9
Duration of treatment		
1 day	31	28.2
2 days	63	57.3
> 2 days	16	14.5
Number of visit to the hospital		
The first time	16	14.5
> 1 times	94	85.5

Discussion

Based on the results of the study showed that patient experience has a positive and significant influence on patient satisfaction. This is in line with research conducted by Kumah [11] saying that patient experience and patient satisfaction are interrelated in assessing the quality of health services, interconnected but in different concepts. The patient experience is about managing sudden changes between emotional and physical patients while undergoing health-care procedures and maximizing the patient's social, mental, physical, and fit health. To support this effort it

is recommended to personalize treatment, partner with patients, and empowerment of employees [12].

Based on the results of the research showed that the image of the hospital has a positive and significant influence on patient satisfaction. The results of this research are consistent with research conducted by Wu [13] who found that the image of the hospital significantly affected satisfaction. This means that the better the hospital's image, the higher the satisfaction felt by patients at Meloy Public Hospital of Sangatta. The results of this research are consistent with the opinions expressed by Andreassen [14] stating that images influence customer satisfaction. Brand image is always associated with product/service attributes because to provide satisfaction to consumers and consumers react to the product//service attributes they buy [15].

Based on the results of the research showed that patient experience has a negative and not significant effect on patient loyalty. The results of this research are not in line with the results of Prasojo's research [16] entitled Analysis of Loyalty Determination of Inpatients in Dr. Moewardi in Surakarta. The results of the research stated that there was a significant relationship between the Determinant Analysis of Loyalty of Inpatients at RSUD Dr. Moewardi in Surakarta.

Based on the results of the research showed that the image of the hospital has a positive and significant influence on patient loyalty. According to Aaker and Keller in Fatmawati [17] stated that the hospital image is the patient perception of quality related to the brand or company name. The results of this research are in line with the results of research conducted by Hidajahningtyas [18] with the research title "Influence of Image, Service Quality and Satisfaction on Patient Loyalty of Executive Polyclinics Regional Hospital Dr. Soebandi Jember Regency." In this research concluded that the higher the level of brand image that plays an important role in changing the quality of service and patient satisfaction, it will make patient loyalty even higher. The image of the hospital is proven to have a significant effect on customer loyalty. The results of this study support the theory that consumer loyalty is formed from the image that exists in a product or service from a company's brand [19].

Based on the results of the study indicate that the patient experience indirectly influences patient loyalty through patient satisfaction, as well as the image of the hospital, stating that there is an indirect effect between the influence of the hospital's image on patient loyalty through patient satisfaction significantly. Research Mittal [20] revealed that loyalty will increase rapidly after passing satisfaction within a certain threshold, there is an increase in scale returns in a reciprocal relationship between the two. The results of this study are consistent with research conducted by Lam [21] revealing patient satisfaction and loyalty having reciprocal relationships with each other. Other research supporting the relationship of satisfaction and loyalty was stated by Gronholdt [22] that customer satisfaction has a positive effect (strong significance) in the formation of loyalty. In addition, Kessler [23] show a statistically significant influence between satisfaction and loyalty, although the effect of overall patient satisfaction tends to be relatively small. The same was stated by Haryeni [24] the effect of satisfaction shows a positive relationship on loyalty [25], [26], [27].

Recommendation

Based on the results of the research and conclusions that have been formulated, then put forward some suggestions or recommendations to maintain the factors that affect patient experience, the image of the hospital for the achievement of patient satisfaction which has implications for patient loyalty.

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Analysis Implementation System Incident Report With Method Realist Evaluation at Siloam Hospitals Balikpapan 2018

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Abstract

BACKGROUND: According to Permenkes No. 11 Tahun 2017, patient safety incidents are any unintended or unexpected incident which could have, or did, lead to harm that could be prevented to patient. Incident reporting system which designed to obtain information about patient safety is used for individual and organization learning.

AIM: This study aimed to analyze the increased success of incident report at Siloam Hospitals Balikpapan.

METHODS: Research design which used is qualitative research with the case study research type and the realist evaluation approach.

RESULTS: The data collection is done through observation and profound interview to five officers who's in charge of incident reporting process at Siloam Hospitals Balikpapan. The data processing uses content analysis. The result shows that incident reporting system's implementation at Siloam Hospitals Balikpapan which seen from the side of context mechanism outcome has been working well.

CONCLUSION: The conclusion of this research defines that the implementation's success due to incident reporting program is accorded by reporting guide which has been legitimated by hospital's directors, human resources who have been equipped with training about reporting program facilitate the reporting process and Head Quality Risk as responsible division to the incident reporting process has high responsibility to the program.

Introduction

Hospital is instance that has aim to give treatment to the patient. However, the alteration of hospital administration paradigm; as hospital is instance which has dense in capital, technology, and resource, make hospital is an easy and prone place to contaminated by conflict in the process of giving the service to the public [1].

Since then, the role of management has been calculated to be involved in determining and handling product quality, but in this era of quality assurance, it has begun to be applied not only to the manufacturing industry but also to the service industry. The service industry or commonly referred to as non-goods is starting to be applied such as in hospitals, health centers, and so on [2]. From time to time, the development of the concept of quality so rapidly must be recognized various programs that have improved the quality of hospital services both in the aspects of input, process, and output or outcome [3]. However, it must be recognized in the quality of service that KTD (unexpected events) often occur which often ends with lawsuits [4].

According to Permenkes No. 11 Tahun 2017, patient safety incidents are any unintended or unexpected incident which did, or could have, lead to the harm that could be prevented to patient. In 2000, Institute of Medicine in "To Err is Human:" Building a Safer Health Care System stated that there are 44.000 up to 98.000 patient's death rate in America's hospital each year which caused by patient safety incident that actually would have been prevented. This incident becomes rare since that number exceeds the death rate which caused by traffic accident and breast cancer [5]. The results of research in Canada shows that 7%-12% of patients experience a safety incident that 30–40% can actually be prevented [6].

Based on research, Kousgaard [7] which intends to explore the reason for not reporting the patient's safety incident in general practice stated that the cause of low reporting rate is time and low effort of hospital to patient's safety incident since hospital's priority is to compete one another so that formal, comprehensive, and systematic reporting is quite difficult to realize in general practice [8].

Incident reporting system which designed to obtain information about patient's safety is used for

individual and organization learning. Evaluation result of incident reporting system to patient's safety shows; there has been policy that manages the input process, however, in the policy's implementation, the act has not appropriate [9]. Related to the problem above, the goal of this research is to analyze the increased success of incident report at Siloam Hospitals Balikpapan.

Materials and Methods

This research is conducted at Siloam Hospital Balikpapan from May 29, 2019, until June 29, 2019. Used research method is qualitative research with the case study research type. Informant in this research consists of the leader of hospital, in this case is CEO (Chief Executive Officer), Ancillary Medical Affair (AMA), Division of Nursing (DON), Head Quality Risk (QR), and Nursing Staff.

Data collection in this research is done by three methods which are profound interview, observation, and document review. Additional instrument as researcher's device in conducting interview is interview's guidelines, tape recorder, filed note, and camera. Obtained data from profound interview are processed manually based on qualitative data processing instruction and the goal of this research. Furthermore, the data are analyzed with content analysis methods and interpreted and served in narrative.

Results

Profound interview is conducted to five informants which consist of the leader of hospital, in this case is CEO (Chief Executive Officer), Ancillary Medical Affair (AMA), Division of Nursing (DON), Head Quality Risk (QR), and Nursing Staff, guided by interview's guidelines which have been arranged before.

Context

According to observation's result and profound interview, informant narrated about the suitability of policy that manages the incident report.

"There is a decree for the program's policy. Later you can ask my secretary for seeing it." (012/SK-DIR/SHBP-IR/XII/2016)" (I1, 51 years old).

Through the informant's statement about the information technology could be shown that majority of the informant have been known which officers who could undertake the report incident through the Q-pulse program.

"All of the officers in Siloam Hospital (could access the program), because this reporting program could be accessed by all the elements (of this hospital), not only the medical officer. The non-medical officer could also access the program, as long as they have the account." (I1, 51 years old).

Informant's statement about communication could be known that socialization has been conducted to all of the staff before the incident report's implementation. This is the following answer which obtained by the informant;

"Yes. There is a socialization before exposing the program to the exposed staff because we have done meetings with the board of directors for the program to be run. Later on, the division who's responsible about this socialization to the staff is medical manager and head nurse.' (I1, 51 years old)

Informant's statement about bureaucracy's structure could be known that there is responsible division to incident report program.

"Yes, (the responsible division is) head quality risk" (I1, 51 years old)"

Informant's statement about the bureaucracy's structure could be known that the policy of the program's implementation could be passed down in stages start from CEO, to head quality risk and will be socialized to implementer staff.

Mechanism

According to the observation's result and interview, it could be known that head quality risk is in charge of receiving all reports which enter the Q-pulse program. The program's display for head quality risk's is different with the program's display for implementer staff. Furthermore, head quality risk will cross-check the application form which filled in by the reporting officer about the suitability. Reporting process has become easier, because it is no longer done manually but is already using Q-pulse application program. As in the process, start from opening the application then logging in through reporting officer's account. Next, choose the new folder to input new incident report. In this folder, could be found a form that must be filled. This form consisted of few category columns that should be filled in which are the hospital's name column, Incident's type (clinic or general), incident report category, location of incident, and date and time of the recording.

Determination process of incident risk rate is done on two ways which are based by the effect of the happened incident and based on reporting guideline of Insiden Keselamatan Pasien (IKP) which arranged by Komite Keselamatan Pasien Rumah Sakit (KKPRS) in 2015. According to observation result and interview, it could be seen that determination process of incident risk rate is conducted after all reports are entering the

head quality risk's account and will be recapitulated and cross-checked to the suitability of risk rate that accorded by KKPRS. The officer who's conducting the report with different program's display of application program in head quality risk's account, define the risk rate according to available form in the program.

On the last step which is incident solving process, it is undertook by head quality risk, then conduct the meeting to discuss the whole reports and determine the next step with quality manager and head of nurse.

Outcome

According to the observation and interview, it could be seen that the increased of incident reporting has been happened since the Q-pulse is implemented. The existence of this program helps the reporting process to become easier so the officer's desire is unlimited by the fear of being blamed (no blame culture) and officer's privacy is guaranteed as reporter.

Discussion

The result shows that incident reporting system's implementation at Siloam Hospital Balikpapan which seen from the side of context-mechanism-outcome has been working well. Implementation of incident reporting system can increase staff interest to reporting every incident so that a reporting culture is formed in Siloam Balikpapan Hospitals.

Based on the Minister of Health Regulation No. 11 Tahun 2017, Pasal 5 stated that there are seven steps toward patient's safety and one of them is developing the reporting system. Implementation of an incident reporting system in a hospital is influenced by several variables that support one another, these variables include policy, resources, communication, bureaucratic structure, and disposition [10]. The research by Iskandar [11] states that the root causes of most common patient safety errors include communication problems, lack of information, human problems, patients dealing with issues, knowledge transfer in organizations, staffing patterns/workflows, technical failures, lack of policies, and procedures.

Implementation of a policy depends on the human resources responsible for implementing the policy. Human resources must be in accordance with the amount and ability. Even though the contents of the policy have been clearly and consistently communicated, if the implementer lacks the resources to implement it, the implementation will not be effective. Human resources must also be able to understand what is implemented, therefore, human resources must get information on how to conduct policies, understand the essence of the consequences of compliance in carrying out the policy [12]. Implementing a patient safety program in a hospital requires the support of all components from the executive level to the hospital manager level [13].

In the incident reporting process, observations were made which compare the hospital's report incident program with reporting guidelines of patient safety incident which that is issued by KKPRS in 2015, incident type determination in incident report program (Q-Pulse) which owned by Siloam Hospital Balikpapan is more specific than KKPRS guideline in 2015 [14].

There are many methods which used to identify the risk, one of them is to develop the incident reporting program. Reporting system will enhance all people in organization to pay attention about danger or potential danger which could occur to patient [15]. Reporting is also important to monitor the prevention of errors so it could encourage the further investigation [16].

According to Hartono [17], perceived ease-of-use is the degree to which a person believes that using a particular system would be free from effort. User or person who assumes an easy-to-use information system will use the information system and vice versa; if the information system is deemed difficult to use, then none will use the information system [18]. According to profound interview to informant, it could be concluded that perceived ease-of-use in incident reporting program (Q-pulse) which made is not inflate, clear, and easily understood in making the report because it made by the computer, then it could simplify the reporter without writing manually and taking a lot of forms.

After the reporting process, the next step is determination risk process. According to category which has indicated in incident reporting form (Q-pulse), there are four categories from Siloam Accidentally Category (SAC), which are 1 = extreme risk, 2 = high risk, 3 = moderate risk, and 4 = low risk. This determination risk process is actually similar with guidelines in Komite Keselamatan Pasien Rumah Sakit (KKPRS) 2015. Risk level category is explained as; in low-risk level, simple investigation is run for a week at most which done with routine procedure. In moderate-risk level, simple investigation is run for 2 weeks at most, as clinic manager or leader evaluates the effect to cost and risk management. In high-risk level, root cause analysis (RCA) is done for 45 days at most with detail analysis, immediate action, and attention from top management. For last, in extreme risk level, RCA is also done for 45 days at most which needs immediate action and attention from directors.

The third process is problem-solving process. According to profound interview and observation, Head Risk Quality as the actor on solving the report in incident reporting program (Q-pulse) use particular user account so the whole reports which has been reported will send it to Head Quality Risk's account [19]. Furthermore, cross-checked is conducted to each of the report folder based on suitability of procedures in the form and risk level determination which has been filled by the reporter

[20], [21]. Solving process of incident report technically will be explained as the followings:

1. Open the incident reporting program (Q-pulse).
2. Enter user and password for logging in. For Head Quality Risk specifically; c. choose the inbox for seeing the incident report.
3. Choose the report folder based on registration number and reporter's name.
4. After the display of reporting form has appeared, Head Quality Risk will cross-check the form start from date reporting column, incident title, and reporter's name.
5. Cross-check the incident's type and risk level based on the suitability with the reported accident and the direct effect of incident.
6. Cross-check the accident's description, victim's name, reporter, and witness.
7. Cross-check the incident report's category specifically.

Furthermore, an analyses reporting incident that is reported will be followed up as its process that has been explained in guidelines of Hospital Patient Safety Committee (KKPRS) in 2015 [14]. Incident reporting completion is conducted by Head Quality Risk based on decree from director who is in his occupied position has suitable competence and profession related to healthy cities and also cooperating with healthy city committees in cities.

Recommendation

Suggestion to the hospital is to provide a complete equipment which in this case is computers as a supporting facility to facilitate the incident reporting process should be separated with the computers which used for administration process at inpatient room.

Conclusion

The conclusion of this research defines that the implementation's success due to incident reporting program is accorded by reporting guide which has been legitimated by hospital's directors, human resources who have been equipped with training about reporting program facilitate the reporting process and Head Quality Risk as responsible division to the incident reporting process has high responsibility to the program.

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The Legal Responsibility of the Doctor on the Family's Demand to Stop the Treatment of the Terminal Patient that Causes Death

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Abstract

AIM: This study aims to determine the responsibility of the doctor and the patient's right to medical health services and to analyze the termination of the treatment to the terminal patient, as well as to analyze the form of legal liability of the doctor related to discontinuation of the treatment that causes death. The research is a normative-empirical approach.

METHOD: The method was qualitative descriptive.

RESULTS: The results showed that the legal liability between the doctor's responsibility and the right of patient in medical health care was private as well as public that subject to the legal regime of health. The form of legal relationship between doctors and patients was an agreement known as the medical consent (informed consent). Determination of an error by a doctor on the discontinuation of the treatment of patients at the request of the family on terminal patient that causes death was determined by several indicators such as the severity of an error, the medical discipline through medical error, and unprofessional behavior. In the criminal law, a doctor was determined guilty by actus reus and mens rea.

CONCLUSION: The responsibility of the doctor on the discontinuation of the treatment of patients at the request of the family on terminal patient that causes death was professional responsibility, among others, the ethical responsibility (referred to objective theory) and the discipline responsibility (referred to mix theory) MKEK and MKDKI would sue the medical profession on legal liability (criminal) referred to the theory of retaliation, however, the judge would confirm the sentence to the doctor.

Introduction

Health is important for everyone. In a healthy condition, a person can think and do all his/her activities optimally and productively. Curative efforts need to be supported by good health-care facilities as well as a good medical service system from health-care facilities. Therefore, a person needs another party who has the expertise to cure him from the disease he suffered.

According to the Constitution of the Republic of Indonesia 1945, on article 28H Paragraph 1, it is stated that "every person has the right to get the prosperity physically and mentally, to live and to obtain a good and healthy environment, and to be entitled to health care." Law Number 36/2009 on health has also regulated the right of every person to get good quality, safe, and affordable health services. Hence, the right to live and obtain good health services is an absolute for every citizen.

Physician is a scientist who is educated professionally to provide help to everyone who needs medical services. Medical education has provided knowledge, skill, and professional attitude for their student to be a competent doctor based on professional behavior to provide help to others. As a profession, medical intervention is a risky action. The risk is unpredictable or the risk occurs due to wrong doctor's intervention (the intervention does not conform with the medical profession standard and medical procedures).

In the Article 45 of Law 29 /2004 on Medical Practice, the agreement occurs between the health worker and the patient is a form of consent from the patient before the health worker performs the medical action to the patient. Such a high-risk medical intervention must be given by written consent and signed by the person who has the right to give consent. The agreement on informed consent is given so that the patient or the patient's family can better understand the risks that could occur.

Nowadays, the system of the medical services performed by health workers as a curative giver is given priority by the community, however, all positive assessments of the health profession begin to fade because in the healing efforts performed by health professionals, in this case referred to a doctor, has unintended result to the patient or patient's family. There

are some malpractices conducted by a doctor or nurse in applying science and skills in the health intervention. Such undesirable consequence is an inherent risk of such medical intervention. The agreement between the health worker and the patient is a type of effort and it is not a commitment to the process but merely on the outcome, so the risk of medical action could occur and may result the death of the patient.

The problem of unintended health-care intervention to the patients or patient's family often occurs in the world of health, especially to terminal patient. The terminal condition is a condition where a person has a disease/illness that has no hope of recovery so it is closed the process of death. The condition of the terminal patient is sometimes misunderstood by the family if undesired condition occurs to the patients [1], [2].

In certain condition, the family of the terminal patient often asks the doctor to release the medical aids of life support. The reasons are vary such as the family of the patient wants to bring the patient to the house so that the person could die peacefully at home; another reason is because of the lack of money. However, it is still a dilemma for medical profession since there is still no exact rule on the guidelines on patient's right to reject the provision of life support. The guidelines should provide the outline to protect the right of the patient to determine his desire, to die naturally, as well as to allow doctors and family to make a decision without any fear of legal aspect because it is the right of the patient.

Based on the above problem, this study aims to analyze the legal liability of the doctor at the request of the family to terminate the treatment of the terminal patient that causes death.

Research Method

Type of Research

The type of research is normative-empirical approach. The normative approach (law as a norm or das sollen) and the empirical approach (law as social reality, culture, and das sollen). The normative-empirical legal research is legal research on the implementation of normative law (codification, law, or contract) on any particular legal event occurs within a society (Abdul Kadir Muhammad, 2004).

Location

The research was conducted at the hospital of Bontang City with the consideration that the location is a representative place to identify some cases of terminal patient.

Types and Data Sources

Types of data used are primary data and secondary data. Primary data are collected directly by doing interviews and observation of the reports in the form of unofficial documents with relevant institutions to be processed by researcher. Secondary data are collected by documentation and other written material related to the object of the research.

Data Collection

The data are from field research, that is, research conducted directly to the object to be studied. Secondary data are obtained from library, that is, to study scientific papers, rule and regulation, as well as legislation, and other sources related to the material to be discussed by the researcher.

Population and Sample

The population in this study was all cases of termination of treatment of the patients at Bontang Hospital. The determination of sample was conducted by purposive sampling technique. The purposive sampling is the selection of special cases of termination of treatment of the terminal patients at the request of the family which causes the death of the patient or there was a prediction to be an euthanasia action.

Data Collection Technique

Data collection techniques used in conducting field research and literature research are (1) interview technique, that is, data collection directly by asking question and reply by the interviewee and (2) documentation technique, that is, data collection technique using documents, and records related to the problem to be discussed.

Data Analysis

Data analysis technique used is qualitative analysis to describe the result of the data obtained in the research, both primary and secondary data. The data are presented in the form of explanation and description as well as the conclusion to answer the formulation of the problem.

Results

Table 1 shows the physician who has a duty to monitor the condition of the patient in the ICU/ ICCU room Bontang Hospital. From the above table, there are six medical doctors. All of the doctors have

a registration certificate (STR) and practice license (SIP) at medical service of ICU/ICCU Bontang Hospital. Medical Practice Law stated that "a physician is required to have STR and SIP as a form of formal legality of his medical practice towards the patient."

Table 1: The description of the physician doctor at the ICU And ICCU Taman Husada Hospital, Bontang City

NO.	Physician at ICU and ICCU room	STR	SIP
1	Dr. F	✓	✓
2	Dr. W	✓	✓
3	Dr. E	✓	✓
4	Dr. A	✓	✓
5	Dr. T	✓	✓
6	Dr. Y	✓	✓

Data Source: Primary data (Personnel of Bontang Hospital).

Table 2 shows that there are 14 physicians in charge of patient at Bontang Hospital. All the doctors also have a registration certificate (STR) and practice license (SIP) to perform medical service at Bontang Hospital. The data from Tables 1 and 2 are important to emphasize because a letter of informed consent will be cancelled if the doctors do not possess STR and SIP.

Table 2: Physicians in charge of patient (DPJP) Taman Husada Bontang Hospital

No.	Medical Doctor	STR	SIP
1	Dr. H, SpAn (Room responsible person)	✓	✓
2	Dr. S, SpJP (Sp. Lung)	✓	✓
3	Dr. D, SpPD (sp. Internal disease)	✓	✓
4	Dr. N, SpPD (Sp, Internal disease)	✓	✓
5	Dr. A, SpS (Sp. nerve)	✓	✓
6	Dr. D, SpP (Sp. Lung)	✓	✓
7	Dr. H, SpB (Sp. Surgery)	✓	✓
8	Dr. K, SpB (Sp. Surgery)	✓	✓
9	Dr. N, SpM (Sp. eye)	✓	✓
10	Dr. A, SpKK (Sp. Skin)	✓	✓
11	Dr. G, SpA (Sp. cild)	✓	✓
12	Dr. F, SpOG (Sp. Obstretry dan Ginekology)	✓	✓
13	Dr. C, SpOG (Sp. Obstetri dan Ginekology)	✓	✓
14	Dr. E, SpPK (Sp. Patology Klinik)	✓	✓

Data Source: Primary Data (Personnel of Bontang Hospital).

The researcher has explained that to assess the competence of the doctor, they could be identified by a letter of STR and SIP.

Table 3 shows that the number of patients from January 2015 to December 2015 was 304 patients while the number of patients in January 2016–April 2016 was 121 patients. The total number of patients from January 2015 to April 2016 was 426 patients.

Table 3: The number of patient at ICU and ICCU room from January 2015 to April 2016

Year	Number
January 2015 to December 2015	304
January 2016 to April 2016	121
Total	426

Data Source: Secondary data (Bontang Hospital).

Table 4 shows that there are three terminal patients who have stopped the treatment or terminate the medical action at the request of the patient's family (at their own request is abbreviated as APS).

Table 4: The number of patient, left the hospital on his own decision at ICU and ICCU room Bontang Hospital

No.	Name	Medical record	Age	Diagnose
1	Ny. H	13.14.	67 Year	Encefalophaty hepaticum+stroke non hemoragic
2	Tn. S	14. 85.	49 Year	Shock Sepsis
3	Ny. M	14. 43.	67 Year	Tumor Colli
4	Ny. J	14. 85.	72 Year	Illeus Paralitic+acute renal failure
5	Ny. S	15. 75.	80 Year	Effusi pleura bilateral, suspect lungs. Mass

Data sources: Patient left the hospital (at the request of the family) at ICU and ICCU Bontang Hospital. Registration of the hospital.

The interview with one of the doctors at Bontang Hospital stated that:

Two patients, that is, Mrs. S and Mrs. J had been treated in the ICU and ICCU rooms. However, his family asked for leaving the hospital at the request of the patient's family (APS). Both patients were elderly patients.

Another patient, Mrs. M was treated in the nursing room but due to her consciousness condition, soon she was transferred to ICU. Having been treated in ICU for 3 days and the patient's unconsciousness, the family asked for leaving the hospital (APS) with the reason to bring his mother died in peace at his house. The prognosis was bad because elderly patient.

Mrs. A patient entered the ICU from a clinic, diagnosed with unconsciousness. Having been treated in ICU room for 2 days, his family asked for leaving the hospital (APS) with the reason to bring his mother to spend her rest of life at the house.

Discussion

This study demonstrated that the responsibility of the doctor on the discontinuation of the treatment of patients at the request of the family on terminal patient that caused death was professional responsibility, among others, the ethical responsibility (referred to objective theory) and the discipline responsibility (referred to mix theory) as well as legal responsibility (criminal) referred to the theory of retaliation.

In a medical practice law, a physician was required to have STR and SIP as a form of formal legality of his medical practice to the patient. If a doctor did not have STR and SIP, the doctor could be punished and the letter of informed consent would be cancelled. The punishment of the doctor who did not have STR and SIP was stated in the medical practice law, that is, put in prison for a maximum of 3 years or a maximum fine of Rp10,000,000,000.

A doctor and other health professionals would be charged for ethical violation if they acted against their professional code of ethics [3]. The ethics code is defined as a set of principles or moral values, which concern the whole principles or the value to decide which one is good or bad. Ethics code for a medical profession is a moral guideline for a doctor to perform their profession, consists of four parts, namely: (1) General obligation; (2) doctor's obligation to patient; (3) doctor's obligations to his colleagues; and (4) doctor's obligation to himself [4].

Medical profession discipline is to obey the rules and regulation on the application of science in the implementation of medical practice. The violation of the medical profession discipline could be found

in the form of (1) Medical negligence, that is, doing something that should not be done or not doing something what should be done and (2) professional misconduct [5]. In the legal aspect between physician's right/responsibility and patient's right in medical action, the law covered both private law and public law [6]. In addition, the form of legal relationship between the two laws was a consent of medical action (known as informed consent). The agreement between the doctor and the patient was from the Medical Practice Law and Regulation from Health Ministry on the Approval of Medical Intervention [7].

Action against the law as stated in the civil law was determined by:

(a) Actions that violate the current law. (b) Violate the right of others guaranteed by law. (c) Actions that are contrary to the offender's legal obligation, or (d) action that is contrary to the norms, or (E) actions that are contrary to the good attitude in certain society to take into account the interests of other people [8].

There was no intention and/or negligence of the doctor to terminate of the treatment of terminal patients at the request of the family (as in the view of researchers). There was a justification or an excuse for the doctor. This justification was based on the request of the family (sometimes under the force of the family).

In the reality, the victim in the termination of treatment was actually the patient and further the nearest patient's family. However, it became a problem when the termination of the treatment was requested by his or her family (as in the view of the researcher).

In the case of the termination of treatment, there was no causal relationship between the action of physicians who were forced to stop the treatment at the request of the patient's family with the loss. If we analyze, the termination of the treatment that caused death to terminal patients, then there was no unlawful intervention conducted by the doctor. (as in the view of the researcher).

To determine whether a doctor had committed unlawful intervention as stated in the criminal law, then there were some requirements. The requirements were divided into two, namely, (1) action (actus reus) consisting of matching the formulation of the sue, against the law, there was no good excuse and (2) criminal responsibility (mens rea) consisting of, that is, level of responsibility, there were some mistakes (dolus or culpa), there was no excuse for forgiveness [9].

In criminal law, the termination of treatment caused in death can be considered as murder, fulfilling the formulation of Article 338 of the Criminal Code or even as panned murder as referred to Article 340 of the Criminal Code, Article 334 of the Criminal Code, namely, the murder of a victim's request, and Article 345 of the Criminal Code concerning assisting a person suicide. Termination of treatment resulting in death can also be attributed to Article 304 of the Criminal Code in the case of omission and Article 531 of the Criminal Code.

The theory of retaliation justified punishment because a person had committed a violation. To the doer, there must be a punishment. No question of the consequences of punishment for the convicted person was raised. The material for judgment was only the past, that is, the time the criminal was conducted whereas the future of the convicted person had never been questioned [10], [11], [12].

In relation to physician's responsibility, the retaliation theory belongs to the doctor's responsibility in the field of law. It must be taken into account that in the case of the doctor's responsibility, there were several punishments, as in criminal law, ranging from death punishment, imprisonment, paid the fine, etc. [13]. The emphasized from the theory of retaliation was the responsibility of law for a doctor not to do the same action.

Objective theory justified punishment because the theory was based on the purpose of punishment, that is, for the protection of the community or the prevention of the criminal action. The difference of some theories was actually on the way to achieve the objectives as well as the use of the prevention of criminal action. The punishment and the imprisonment were intended to provide a lesson for a doctor on the importance of a cautious principle in providing medical treatment. The doctor must follow the SOP that guided the physician to do the intervention. In this case, the researcher classifies it to ethical accountability.

The mistakes conducted by a physician not only take into account the past (as found in the theory of retaliation) but also take into consideration the future (as stated in the objective theory). Therefore, the punishment will give a sense of satisfaction for MKEK, MKDKI, to the doctor and to the community. The researcher's analyzed that the combined theory was the responsibility of the professional discipline [14].

Conclusion and Recommendation

Based on the result and discussion, it can be concluded that the responsibility of the doctor on the termination of the treatment of patients at the request of the family on terminal patient that caused death was professional responsibility, among others, the ethical responsibility (referred to objective theory) and the discipline responsibility (referred to mix theory) as well as legal responsibility (criminal) referred to the theory of retaliation. MKEK and MKDKI are those who hold the responsibility of the physician profession. Whereas in the legal aspect, the judge will have the responsibility to examine, to decide, and to prosecute the verdict

in the court. As the judge was the employee under the Supreme Court. Regarding the termination of the treatment of patients at the request of the family on terminal patient that caused death, the legislator should make a new law as a legal protection for both patients and doctors. The new law should accommodate and provide solution between doctor's responsibility and patient's rights in medical intervention.

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Effect of Patient Centered Care Application on Inpatient Outcomes in Rskdia Pertiwi and Rsia Ananda (Woman and Child Hospitals)

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Abstract

BACKGROUND: Patient-centered care (PCC) is a new paradigm in healthcare that places patients as the center of care to improve health outcomes and increase patient and family satisfaction.

AIM: The study aimed to evaluating the effect of PCC application on inpatient outcomes, notably patient satisfaction, and clinical outcomes in RSKDIA Pertiwi and RSIA Ananda.

METHODS: The study was quantitative analytic with cross-sectional design. A sample of 92 patients were determined proportionally, and selected with the inclusion criteria. Data were collected using measuring tools consisting of PCC questionnaires, patient satisfaction questionnaires, and patient medical record to evaluate the clinical outcomes of patient. Bivariate analysis was carried out to compare the PCC application between the two hospitals, and multivariate analysis to correlate the effect of PCC application to patient satisfaction, and clinical outcomes of inpatient in each hospital.

RESULTS: There was effect of PCC application on patient satisfaction in RSKDIA Pertiwi ($p = 0.017$) and RSIA Ananda ($p = 0.000$), but there was no effect show to the clinical outcomes in RSKDIA Pertiwi ($p = 0.718$) and RSIA Ananda ($p = 0.440$), also there was no differences in the application of PCC ($p = 0.492$) between both hospitals.

CONCLUSION: It can be concluded that the application of PCC attributed to patient satisfaction, but did not affect the clinical outcomes of inpatients at RSKDIA Pertiwi and RSIA Ananda; also there were no differences of PCC application between both hospitals. The hospitals management should improve the application of PCC, particularly in coordination of care.

Introduction

The topic of the quality of service and patient safety has been one of the global issues and major focuses toward the health service, without exception in Indonesia. Hospitals are required to be able to guarantee the quality and safety of patients in providing services. In 2001, IOM in a report "Crossing The Quality Chasm: A New Health System for the 21st Century" recommended a number of fundamentals needed in a health-care system known as Six Aims to Improve Healthcare, one of which is health-care institutions is required to able to provide services that are patient-centered [1].

Patient-centered care (PCC) is defined as care that is both respectful and responsive to the patient's preferences, needs, and values. In addition, this system ensures that patient values are used as guidelines in determining clinical decisions by health-care providers. PCC is one of the dimensions of high quality health services, where its application has been proven to improve the quality of overall health services [1]. PCC is a new paradigm in healthcare that places patients as the center of care. The new paradigm aims to get better health service outcomes, allocate appropriate resources, and improve patient and family satisfaction [2].

In Indonesia, the hospital's obligation to continuously improve and guarantee the quality of its services is regulated in Pasal 40 UU No. 44 Tahun 2009, which emphasized that hospitals must obtain accreditation periodically at least once every 3 years as part of efforts to improve the quality of services [3]. Accreditation carried out by the Hospital Accreditation Commission (KARS) requires hospitals to adopt and apply quality standards in accordance with the National Hospital Accreditation Standards (SNARS) 1st edition.

The SNARS 1st edition is designed with service standards that focus on patients with a risk management approach at the Hospital. This aims to not only influence the process, output, and outcomes but also to the application where all officers in the accreditation process are involved with the hope that a KARS-accredited hospital has the quality assurance, which will positively influence clinical outcomes and increase satisfaction patient in the long run [4].

In addition to the application of patient-centered standards, the application of PCC in accredited hospitals must be reviewed from the perception of patients as the main stakeholders in the health-care system [5], [6]. The

application of PCC influences the patient's condition and perception of service quality which has an effect on increasing patient satisfaction, clinical outcomes, and hospital outcomes in ongoing process [7]. The results of the previous studies indicate that the application of PCC correlates to patient perceptions, satisfaction levels, and better service quality [8].

The application of PCC through patient involvement in their care can improve functional status, self-care behavior, and patient satisfaction. This process increases the knowledge and concern of patients for the conditions they experience, which makes patients actively involved in care, thereby increasing patient satisfaction and functional status [9]. Through PCC, nurses can better understand the problems experienced by patients individually. This makes patients feel more valued and served well, resulting in increased patient satisfaction [10].

Study showed that patient involvement in decision-making toward care was positively correlated with improvement in functional status, self-care behavior, and patient satisfaction [11]. This study evaluates patients' perceptions of the application of PCC in two different setting mother and child hospitals in Makassar, both in ownership, hospital class, and different levels of accreditation: RSKDIA Pertiwi which is a Class B mother and child hospital owned by the South Sulawesi provincial government and is accredited by SNARS 1st edition at the level Utama, and RSIA Ananda which is a private Class C mother and child hospital and has been accredited by SNARS 1st edition at the level "Madya."

Although accredited, the level of inpatient satisfaction in both hospitals has not reached ≥ 90% according to the Hospital Minimum Service Standards according to the Health Ministry of Indonesia. In addition, there are no data on achieving clinical outcomes in both hospitals, where patient outcomes as a guarantee of service quality in both hospitals have not been achieved. This study aims to evaluate the application of PCC and its effect on patient outcomes in the form of patient satisfaction and clinical outcomes of inpatient at RSKDIA Pertiwi and RSIA Ananda, and to compare the application of PCC between both hospitals.

Materials and Methods

This study was conducted at the RSKDIA Pertiwi and RSIA Ananda from May to July 2019. The study was quantitative analytic with cross-sectional design approach. This study was designed to evaluate the effect of independent variables on two dependent variables: PCC on Patient Satisfaction and Clinical Outcomes of Inpatient in RSKDIA Pertiwi and RSIA Ananda.

The population in this study was all patients with post-emergency cesarean section who was hospitalized in RSKDIA Pertiwi and RSIA Ananda. The total sample was 92 patients who were determined proportionally: Twenty-one patients in RSKDIA Pertiwi and 71 patients in RSIA Ananda. The samples were collected with the following inclusion criteria: (1) In a conscious state; (2) admitted to the hospital with impartus status; (3) underwent emergency cesarean section surgery; (4) indication of emergency CS with prolonged 2nd stage, fetal distress, oligohydramnios, induction failure, or cephalopelvic disproportion; (5) the patients did not experience severe preeclampsia, eclampsia, or HELLP syndrome; (6) the patient did not experience severe systemic diseases such as heart failure, kidney failure, liver failure; (7) inpatients ≥ 1 day; and (8) performed outpatient control at least 7 days after hospitalization.

Data were collected using a measuring instrument in the form of a PCC application questionnaire, patient satisfaction questionnaire, and medical record data to review the clinical outcomes of the patient (inpatient) which consisted of length of stay (LOS), the presence or absence of phlebitis, the presence or absence of Hospital Acquired Infection, and presence or absence of surgical site infection at least 7 days after hospitalization.

The data were collected and analyzed using SPSS Version 22. Univariate analysis was performed to obtain the results of the characteristics of respondents and describe the achievements of each of the variables studied. Bivariate analysis of Mann–Whitney test was used to measure the comparison between the application of PCC in the RSKDIA Pertiwi and RSIA Ananda. Meanwhile, multivariate analysis of logistic regression tests was used to measure the effect of PCC application on patient satisfaction and clinical outcomes in RSKDIA Pertiwi, and linear regression tests were used to see the effect of PCC application on patient satisfaction and clinical outcomes at RSIA Ananda.

Results

Table 1 shows the characteristics of respondents in RSKDIA Pertiwi. At the onset, the majority of respondents were at the ideal age of pregnancy (18–35 years old) with 66.7%, while most of them were housewives and unemployed with 57.1%. In the next category, the most ethnic groups were from Makassar, which reached 57.1%, while the highest level of education was high school or equivalent with 33.3% and postgraduate education of 4.8%. In the category of religion, the majority of respondents are Muslim, reaching up to 81.8% and the rest are Christians. Furthermore, the majority of respondents utilize national insurance (BPJS Kesehatan) by 81%

and others seek treatment at their own expense or use private insurances at 9.5%, respectively. At the inpatient room, most respondents were at Class 3 with 42.9%, and others were moderately distributed in each class moderately where the percentage of each class was VIP/VVIP with 19%, Class 1 with 23.8%, and Class 2 with 14.3%. In the category of pregnancy history, 61.9% of respondents were multipara, and only 33.3% of patients had a history of cesarean section. Furthermore, 66.7% of patients were without cesarean section history, and 38.1% of patients were in the first pregnancy (primipara).

Table 1: Characteristics of respondents

Characteristic of respondents	RSKDIA Pertiwi		RSIA Ananda	
	(n=21)	%	(n=71)	%
Age				
Ideal (18–35 years)	14	66.7	58	81.7
At risk (> 35 years)	7	33.3	13	18.3
Religion				
Islam	17	81.8	70	98.6
Christian	4	19.2	1	1.4
Ethnicity				
Makassar	12	57.1	36	50.7
Bugis	5	23.8	31	43.7
Toraja	2	9.5	0	0
Mandar	0	0	1	1.4
Others	2	9.5	3	4.2
Occupation				
Public Sector	5	23.8	4	5.6
Private Sector	2	9.5	13	18.3
Entrepreneur	1	4.8	9	12.7
Professional	0	0	3	4.2
Unemployed	12	57.1	33	46.5
Others	1	4.8	9	12.7
Monthly income				
IDR<1,000,000	0	0	12	16.9
IDR 1,000,000-3,000,000	2	9.5	14	19.7
IDR 3,000,000-5,000,000	7	33.3	12	16.9
IDR>5,000,000	0	0	3	4.2
No Income	12	57.1	30	42.3
Payment method				
Out of Pocket	2	9.5	0	0
National Insurance (BPJS)	17	81	69	97.2
Private insurances	2	9.5	2	2.8
Education				
Without formal school	1	4.8	0	0
Primary	2	9.5	7	9.9
Secondary	2	9.5	4	5.6
High school	7	33.3	19	26.8
Non-degree vocational diploma	2	9.5	12	16.9
Bachelor degree	6	28.6	25	35.2
Postgraduate degree	1	4.8	4	5.6
Inpatient room				
VIP/VVIP/Pavillun	4	19	4	5.6
Class 1	5	23.8	18	24.4
Class 2	3	14.3	21	29.6
Class 3	9	42.9	28	39.4
Pregnancy history				
Primipara	8	38.1	30	42.3
Multipara	13	61.9	41	57.7
History of CS				
History of CS (-)	14	66.7	27	38
History of CS (+)	7	33.3	44	62

At RSIA Ananda (Table 1), the majority of patients' age also ranged around the ideal age of pregnancy (18–35 years old) with 81.7%, where 98.6% of respondents were Moslem and only 1.4% were Christians. About 50.7% came from Makassar, and 43.7% were Buginese, while the rest came from Mandar, and other ethnicities. In the category of occupation, most respondents were housewives or unemployed with 46.5%, followed by private employees at 18.3%. At the education level, most respondents were bachelor by 35.2% and the smallest percentage was at the master and junior/senior high school education level of 5.6%. Table 1 also shows that the majority of respondents applied national insurance at 97.2% and only 2.8% with private insurance. Whereas, in the inpatient room, respondents at RSIA Ananda were quite distributed, which consisted of Class 3 with 39.4%, Class 2 with 29.6%, Class 1 with 24.4%, and VVIP/VIP with 5.6%. Furthermore, the majority of respondents at RSIA Ananda had a history of cesarean section surgery which reached 62%. Whereas in the history of pregnancy, 57.7% of respondents were multipara patients and 42.3% were primipara (first pregnancy).

The application of PCC is a patient's perception of care covering eight dimensions in the form of respect for patient preferences and value, information, education, and communication, coordination of care, emotional support, physical comfort, involvement of family, continuity and care, and access to care, as measured by the PCC application questionnaire. Table 2 shows that the application of PCC is good with the percentage of respondents in RSKDIA Pertiwi at 66.7% and in RSIA Ananda with 69%.

Table 2: Frequency of variables

Variables	RSKDIA Pertiwi			RSIA Ananda		
	(n=21)	%	mean	(n=71)	%	mean
The application of PCC						
Poor	7	33.3	67.14	22	31	67.12
Good	14	66.7		49	69	
Patient satisfaction						
Not satisfied	15	71.4	66.62	35	49.3	72.75
Satisfied	6	28.6		36	50.7	
Clinical outcomes						
Not achieved	5	23.8	4	19	26.8	4
Achieved	16	76.2		52	73.2	

According to the achievements of the PCC in each hospital (Table 3), it is clear that the dimension of Respect for Patient Preferences and Values was the highest according to respondents in RSKDIA Pertiwi at 90.5%, while RSIA Ananda showed the highest percentage in the dimension of Information, Education, and Communication. Meanwhile, the dimension of Coordination of Care showed the lowest percentage of application in both hospitals.

The Mann–Whitney test for comparison of the application of PCC in RSKDIA Pertiwi and RSIA Ananda resulted in p = 0.492, which meant there was no significant difference in the application of PCC in RSKDIA Pertiwi and RSIA Ananda. In addition, Table 1 shows that there was no significant difference in the application of PCC in the two hospitals, both from the achievement of the application and the mean values in the two hospitals.

The logistic regression test results of the effect of the application of PCC to patient satisfaction in RSKDIA Pertiwi showed p = 0.012 (Table 4), and in the linear regression test, the application of PCC to patient satisfaction at RSIA Ananda showed p = 0.000 (Table 5). According to these results, there was an affect of the application of PCC to patient satisfaction both in RSKDIA Pertiwi and RSIA Ananda.

Meanwhile, the results of the logistic regression test on the effect of the application of PCC on clinical outcomes in RSKDIA Pertiwi showed p = 0.718

Table 3: Frequency of the dimensional of the PCC application

Dimensions	RSKDIA Pertiwi			RSIA Ananda		
	(n=21)	(%)	Mean	(n=71)	(%)	Mean
Respect for patient preferences and values						
Poor	2	9.5	8.90	20	28.2	8.52
Good	19	90.5		51	71.8	
Information, education and communication						
Poor	8	38.1	8.23	12	16.9	8.73
Good	13	61.9		59	83.1	
Coordination of care						
Poor	11	52.4	7.52	29	40.8	8.34
Good	10	47.6		42	59.2	
Emotional support						
Poor	11	52.4	8.28	28	39.4	8.41
Good	10	47.6		43	60.6	
Physical comfort						
Poor	8	38.1	8.24	25	35.2	8.34
Good	13	61.9		46	64.8	
Involvement of family						
Poor	3	14.3	8.76	22	31	8.49
Good	18	85.7		49	69	
Continuity and transition						
Poor	7	33.3	8.57	20	28.2	7.94
Good	14	66.7		51	71.8	
Access to care						
Poor	3	14.3	8.62	23	32.4	8.35
Good	18	85.7		48	67.6	

(Table 4), while the results of the linear regression test on the effect of the application of PCC on clinical outcomes at RSIA Ananda showed p = 0.440 (Table 5).

Table 4: Effect of PCC application on inpatient outcomes in RSKDIA Pertiwi

Variables	B	SE	Wald	Df	Sig.	Exp (B)
Patient satisfaction	2.079	1.133	5.714	1	0.017	0.067
Clinical Outcomes	0.383	1.060	0.130	1	0.718	1.467

These findings indicate that there was no affect of the application of PCC on clinical outcomes both in RSKDIA Pertiwi and RSIA Ananda.

Table 5: Effect of PCC application on inpatient outcomes in RSIA Ananda

Variables	B	SE	Beta	t	Sig.
Patient satisfaction	1.240	0.142	0.726	8.760	0.000
Clinical Outcomes	−0.008	0.010	0.093	–0.776	0.440

Discussion

This study shows that the application of PCC in RSKDIA Pertiwi was relatively low. However, based on the frequency distribution of the PCC dimensions shows that the dimension of respect for patient preferences and values was very well implemented according to respondents, followed by dimension of involvement of family and access to care.

Likewise, the application of PCC in Ananda RSIA which is also relatively low, but if it is seen based on the frequency distribution of the PCC dimension it is known that the Information, Education and Communication dimensions have been well implemented according to respondents, followed by the dimension of respect for patient preferences and values, as well as continuity and transition. Respecting patient needs and their preferences, involvement of family, and access to information are the main elements in PCC [12]. It can be said that although the application of PCC in both hospitals is relatively low, but both hospitals have applied the basic principles of PCC application.

The high percentage of the dimension of respect for patient preferences and values in RSKDIA Pertiwi and dimension of Information, Education, and Communication in RSIA Ananda is due to the application of the accreditation standards that focus on patients, particularly related to Standard of Patient and Family Rights and Management of Communication and Education [4]. In RSIA Ananda is also supported by the role of doctors and nurses/midwives who are on average young at RSIA Ananda, with more friendly and communicative services to patients.

On the other hand, the dimension of coordination of care was the dimension with the lowest percentage of PCC according to respondents both in RSKDIA Pertiwi and RSIA Ananda. This shows that beside effective communication, the application of Coordination of Care also requires, collaboration, and standardization of processes to ensure that planning, coordination, and implementation of care can support and respond to each patient's needs and targets [4].

Statistical tests show the effect of the application of PCC to patient satisfaction both in RSKDIA Pertiwi and RSIA Ananda. Studies show that health-care delivery that is in accordance with patient needs and involving patients in their care is positively correlated with patient satisfaction [11]. In PCC, nurses better understand the problems experienced by patients individually. This makes patients feel more valued and served, thereby increasing patient satisfaction [10].

Involving patients in their care could increase the patient's knowledge and concern for the conditions they are experiencing, thus making patients more actively participated in their care, also increasing patient satisfaction [9]. Study showed a significant differences in satisfaction levels in the group receiving

PCC compared to the control group, with the results of patients treated with PCC having a higher level of satisfaction [8], [13].

Studies showed that the application of PCC can improve patient experience of better health-care quality, and create new value in services. The PCC concept designs healthcare processes to meet patient needs [14]. In general, satisfaction can be achieved when quality is able to meet expectations and needs [15]. The success of PCC can meet the needs and expectations of patients for quality of care so that makes patients more satisfied with the service.

Meanwhile, statistical tests show there is no affect of the application of PCC on clinical outcomes in RSKDIA Pertiwi or at RSIA Ananda. According to several studies, the application of PCC affect clinical outcomes associated with functional status improvement. This is due to PCC application which can increase patient compliance with doctor orders and therapies given [9], [11], [16].

The application of PCC also has a positive impact on clinical outcomes related to patients' self-care behavior after discharge from hospital; patients treated with PCC are able to deal with symptoms and changes in conditions experienced in carrying out their daily activities [9], [11], [17]. In addition, the application of PCC is associated with a decrease of the anxiety level of patients during their care [18], [13].

Clinical outcomes associated with PCC in the previous studies are subjective, which assessed using the patient-reported outcome measure (PROMs) model after the patient discharge from the hospital. Whereas, clinical outcomes assessed in this study are clinical related and objective through the patient's medical record.

Study evaluated the similarity clinical outcomes with this research show that no significant correlation between PCC application with clinical outcomes, including length of stay (LOS), postoperative infection, falls and postoperative complications, in patients treated with PCC compared with those not treated with PCC [8].

The two different of clinical outcomes assessed in the previous studies indicated that clinical outcomes assessed in this study are influenced by clinical management related. This result is attributed by the monitoring of suboptimal implementation of clinical pathway after cesarean section surgery, especially related to post-operative length of stay [19], [20].

In addition, clinical outcomes assessed in both hospitals are associated by host-related risk factors, operation-related risk factors, and microbe-related risk factors [21], [22], [23], [24]. Therefore, if the infection control and prevention program in both hospitals are well implemented, it will affect the achievement of related-clinical outcomes.

Statistical test also shows that there was no significant difference in the application of PCC in RSKDIA Pertiwi and RSIA Ananda. The successful application of PCC is associated with organizational culture that encourages staff to be more sensitive to the needs of patients in the hospital. In addition, it is needed effective leadership, adequate resourcing to support the model of care, staff capacity building, and active involvement of patients and families in all facet of the organization to achieve PCC [25].

It is intended that PCC can be implemented well and meet the concept. Patients, families, health workers, and health service leaders collaborate on policy making and program development, implementation and evaluation, both in research, facility design, professional education, and health service provision. The application of PCC does not correlate directly with the level of accreditation, type of ownership and hospital class, but this requires the role of all stakeholders and the commitment of health-care organizations in implementing PCC in accordance with predetermined concepts.

Recommendation

It is hoped that hospital management will improve the application of PCC by applying the concept of PCC holistically in providing services, particularly in the dimension of coordination of care. Effective communication is needed between service providers, patients and staff, as well as collaboration between professions and standardization processes to ensure that care plans, service coordination, and care applications support and respond to each patient's unique needs. This supports the fulfillment of patient expectations of service quality and increases overall patient outcomes.

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The Effects of Public Service Motivation to Medical Specialist's Organizational Citizenship Behavior at Haji Makassar Hospital and Kota Makassar Hospital

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Abstract

BACKGROUND: Public service motivation (PSM) aims to underline the individual appreciation associated with public interest. If PSM is connected with organizational citizenship behavior (OCB), then the effectiveness is expected to be manifested in the increase of service quality.

AIM: This study aimed to analyze the effect of PSM to the medical specialist's OCB of Haji Makassar Regional Public Hospital and Makassar Regional Public Hospital.

METHODS: This research is quantitative research using analytic observational design with cross-sectional approach. The population in this research are all medical specialists at Haji Makassar Regional Public Hospital and Makassar Regional Public Hospital with the total of 72 people. Meanwhile, the samples of medical specialists in this research are exhaustive sampling. This research uses questionnaires and the data are tested using logistic regression test.

RESULTS: The logistic regression test shows that there is an effect of PSM on OCB (p = 0.000). This research is expected to be an input for hospital management to pay attention about the human resources, in this case medical specialist so that in the future, it will create good quality services.

CONCLUSION: Based on the research conducted, it can be concluded that there is an effect between PSM and the doctor's OCB at Haji Regional Public Hospital and Makassar Regional Public Hospital. The higher the doctor's PSM is then the OCB will be higher too to doctors in Haji Regional Public Hospital and Makassar Regional Public Hospital.

Introduction

Hospital is a health service institution that provides complete individual health service and also inpatient service, outpatient service, and emergency service [1]. Therefore, hospital is demanded to provide good quality service which is very determined by the human resources in there.

Good quality must be maintained by taking measurements continuously so that strengths and weaknesses from the service provided can be known, and follow-up according to its problem priority can be made [2].

One of the alternatives to manage the organization to improve the quality service is by applying good utilization of human resources will help the organization in running expected service system [3]. In accordance to what stated by Andrew [4] the organization ability to achieve it's goal depended on it's employees willingness to contribute. Houston [5] then made a research in public sector in which individual contribution will be useful for the organization.

Doctor is regarded as the main key in health service system in the hospital [6]. The doctor is also a key stakeholder responsible for providing health service to the patients as a doctor in charge of service. Employees motivation is considered important in any organizations because with the motivation inside the employees, the hospital will no longer need to increase human resources. In public service sector, a concept called public service motivation (PSM). PSM can be defined as an individual tendency to respond on unique basic motives in the institutions and public organizations [7]. Efforts to achieve good service quality demand the employee behavior to not only behave according to formal responsibilities but also to non-formal responsibilities or called by organizational citizenship behavior (OCB). The behavior that is being demanded by the organization today is not only in-role behavior or according to formal responsibilities but also extra-role behavior that is outside of formal responsibility [8]. OCB can describe "good soldier syndrome" [9] so that this research aims to analyze the effect of PSM to the medical specialist's OCB of Haji Makassar Regional Public Hospital and Makassar Regional Public Hospital.

Materials and Methods

This research is conducted at Haji Makassar Regional Public Hospital and Makassar Regional Public Hospital. Both of these hospitals are Class B regional public hospital located in Makassar. The research design used is quantitative using analytic observational design with cross-sectional approach.

All doctors who provide services and serve in regional public hospital in Makassar in this research, this is consisted of two Class B regional public hospitals in Makassar, that is, Haji Makassar Regional Public Hospital and Makassar Regional Public Hospital with total 72 medical specialists. Meanwhile, the samples of this research are exhaustive sampling, which is a sampling technique with all members of the population that fulfill inclusion criteria in this research as the samples.

The researcher uses data questionnaires as the data collection method in this research, by distributing questionnaires to respondents and the respondents fill in the questions contained in that questionnaires. The data are collected using structured questionnaires which must be filled by the respondents. The measurement is done using Likert scale. For the respondent's answer for all questions in each variable will be given score from scale 1 to 4.

PSM variable is measured using the instrument developed by [10]. Its indicator is consisted of commitment to public interest and public value, compassion, and self-sacrifice. OCB uses the most recent indicator stated by Dekas [11] with five indicators such as employee sustainability, social participation, civic virtue, voice, and helping.

Data analysis in this research uses univariate analysis and multivariate analysis. Univariate analysis is consisted of descriptive analysis of respondent characteristic, descriptive analysis of research variables, and cross-tabulation analysis between respondent characteristic and research variable. This research uses numeric data so that it uses the mean, median, and standard deviation value. Meanwhile, multivariate analysis uses simple logistic regression test analysis.

Results

The data in Table 1 show that based on age group, the respondents appeared to spread in five age groups. Nevertheless, the age group between 51 and 60 years old has the highest percentage (38.9%) and the age group <30 years old has the lowest percentage (1.4%). Then, from the table above, the respondents with female gender are the most (65.3%).

Table 1: Frequency distribution of medical specialist respondent characteristics at Haji Regional Public Hospital and Makassar Regional Public Hospital in 2019

Respondent characteristic	Total	
	n	%
Age		
<30 years old	1	1.4
30–40 years old	13	18.1
41–50 years old	27	37.5
51–60 years old	28	38.9
60 years old	3	4.2
Gender		
Male	25	34.7
Female	47	65.3
Work time		
<1 year old	4	5.6
1–10 years old	34	47.2
11–20 years old	20	27.8
>20 years old	14	19.4
Professional education		
Sub-specialist doctor	3	4.2
Medical specialist	67	93.1
Specialist dentist	2	2.8
Employment status		
Government employees	61	84.7
Others	11	15.3

Table 1 also shows work time, can be seen that the highest percentage (47.2%) who have worked 1–10 years and the lowest percentage (5.6%) lies on the group who have worked in the research hospital for <1 year. The average respondents only reached the level of education of medical doctors (93.1%) and the lowest percentage (2.8%) lies on the specialist dental profession. Finally, the respondent characteristic is based on employment status. It appeared that the respondent with civil servant status holds the highest percentage (84.7%).

Data in Table 1 show that based on age group, it appeared that the respondents spread to four age groups. Nevertheless, age group >45 years old has the highest percentage (58.3%) and age group 15–25 years old has the lowest percentage (12.5%). Then, from the table above, it appeared that the respondents with female gender hold the highest (55.6%) and others (44.4%) are respondents with male gender.

Data in Table 1 show for respondent's occupational group, it can be seen that the highest percentage (43.1%) is respondent group with other jobs, meanwhile, the lowest respondent occupational group is laborers group with 6.9%. Based on the respondent education group, the highest is senior high school education level with the percentage (40.3%) and the lowest is respondent group with junior high school education level with 9.7%.

Finally, data in Table 1 show that respondent group with a guarantee status which the respondent group average uses health insurance guarantee status with 81.9% and the rest uses general guarantee status with 18.1%.

Based on Table 2, it can be known that the respondent's PSM level at Makassar Regional Public Hospital and Haji Regional Public Hospital dominates high PSM category level which each of them with 70.7% and 67.7%. Meanwhile, the rest are in adequate PSM level with each 29.3% and 32.3%.

Table 2: Distribution of doctor public service motivation level frequency difference between Haji Regional Public Hospital and Makassar Regional Public Hospital in 2019

Public service motivation	City Regional Public Hospital			
	Haji Regional Public Hospital		City Regional Public Hospital	
	n	%	n	%
Low PSM	0	0	0	0
Adequate PSM	10	32,3	12	29,3
High PSM	21	67,7	29	70,7

Based on Table 3, it can be known that the level of OCB in respondents at Haji Regional Public Hospital and Makassar Regional Public Hospital has almost equal number of distributions in dominating the category of high OCB level with 74.2% and 73.2%. The rest lies on adequate OCB level with 25.8% and 26.8%.

Table 3: Distribution of doctor organizational citizen behavior frequency difference between Haji Regional Public Hospital and Makassar Regional Public Hospital in 2019

Organizational citizenship behavior	Hospital			
	Haji Regional Public Hospital		Kota Regional Public Hospital	
	n	%	n	%
Low OCB	0	0	0	0
Adequate OCB	8	25.8	11	26.8
High OCB	23	74.2	30	73.2

Based on Table 4, the test result between the variable of PSM on OCB obtains Sig. value (0.000) < 0.05 which means that there is an effect between PSM and OCB.

Table 4: Test result of research variable logistic regression in doctors at Haji Regional Public Hospital and Makassar Regional Public Hospital in 2019

Variable	Nagelkerke R square	Constant	B	Sig.	Exp (B)
PSM-OCB	0.441	−15.347	0.529	0.000	1.697

Discussion

PSM has an effect on the doctor's OCB at Haji Regional Public Hospital and Makassar Regional Public Hospital. This relationship shows that the higher PSM owned by a doctor, the higher the OCB displayed by them and vice versa. That result indicates that OCB is able to bring up initiative behavior to help colleagues in an organization voluntarily. Increasing OCB behavior is shown by the increase of initiative behavior to help colleagues voluntarily, the behavior of maintaining good relations with colleagues to avoid conflicts, willing to accept anything set by the organization even in unreasonable circumstances, high dedication to job, and desire to exceed the standard of achievement in every aspect, like the responsibility to involve, participate, and care about various events held by the organization.

The relationship between (PSM) and OCB is not a new thing. Theoretically, some factors can explain the relationship. Two studies connect PSM and OCB. Based on the survey to Korean government employees, Kim [12] found that respondents with high PSM level are more likely to be related to high OCB performance too. OCB performance can be voluntary behavior to take additional responsibility/involvement in other pro-social behaviors compared to respondents with low PSM.

Further, research by Ferdousipour [13] shows that there is a significant relationship between the pattern of PSM and citizenship behavior to the quality of service. Therefore, provision of adequate services through employee recruitment with high motivation for public services significantly increases public trust to government as the source to provide high-quality service. Wright [14] states that PSM owned by someone will foster positive interpersonal citizenship behavior in the organization.

As one of the motivation theories that determine the values and attitudes beyond personal or organizational benefits, the model of PSM aims to underline individual appreciation associated with public interest. If the pattern of PSM is optional, will be synchronized with citizenship behavior, its effectiveness will be manifested in improving service quality.

This research is in accordance with previous research conducted by Cun [15] that research found that PSM significantly affected the employee's OCB, in accordance with the norms that exist in society so that the emergence of an attitude to help others sincerely without expecting certain rewards. That result also showed that public sector employees did not expect anything based on the existence of material, but consider more and put forward the norms that exist in society and organizational culture to affect and invite other employees to behave positively.

According to Kim [16], statistical analysis showed two dimensions that could be differentiated from OCB and showed the proof of relationship between PSM and OCB, organizational commitment, and OCB. Government employees in Korea who have high PSM are more likely to be related to OCB performance compared to low PSM and that those who are effective committed to government organizations are more likely related to OCB performance.

In a study, structural equation modeling to test 1.016 government employees in the metropolitan area of Guadalajara, Mexico, Andrew [4] found that an employee with high motivation to serve in public sector also tends to have good insight about organizational performance.

It can be concluded that the more someone enjoys the PSM, then the behavior of community organizations little by little will be more positive too. This problem is not only confirmed in the West but also shown in countries like Tajikistan. Therefore, the generalization cannot be avoided. The increase of stable public service quality is regarded as an indispensable need to create work atmosphere because it can train intrinsic work motivation in public sector [17].

From the research data processing results done by Widyananda [18], it can be seen that coefficient

of 0.598 with p-value of 0.000 < 0.050 so that it is proved that PSM significantly affects OCB. According to her, PSM is one of the employee's main drivers in working to fulfill and serve society needs of statistics and carry out the duties to serve the country.

The studies above show that PSM is an antecedent Organization Citizenship Behavior (OCB) between the employees in public sector [19]. Significant relationship between PSM and OCB has been proven by other researchers in various parts of the world [20], [21], [22].

Recommendation

The hospital management can pay attention on the quality between each doctor in the hospital and able to identify to maintain and increase the potential motives owned by a doctor in serving public. Management is needed to give a higher rating with intrinsic employee benefits in the form of work achievement and pride compared to something extrinsic such as salary, position promotion, work safety, status, and prestige.

Conclusion

Based on the research conducted, it can be concluded that there is an effect between PSM and the doctor's OCB at Haji Regional Public Hospital and Makassar Regional Public Hospital. The higher the doctor's PSM is then the OCB will be higher too to doctors in Haji Regional Public Hospital and Makassar Regional Public Hospital.

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Counseling Quality of Dangerous Signs of Pregnancy Health in Work Region of Urban and Rural Puskesmas (Public Health Center) Jeneponto

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Abstract

BACKGROUND: Quality healthcare is the standard of care received by citizens who are entitled to guarantee their health status due to the poor quality of health care that affect the high mortality.

AIM: This study aimed to determine the difference in counseling quality of pregnancy dangerous signs at the public health centers of urban and rural areas in Jeneponto regency.

METHODS: The type of study was analytical observation with a cross-sectional study design. The populations of this research are all pregnant women in Jeneponto regency in October 2015–May 2016 at the work area of Urban and Rural Public Health centers. There were 278 respondents obtained by proportionate stratified random sampling. Data analysis used computer application of SPSS examined with the Chi-square test.

RESULTS: The results indicate that 85.3% of counseling quality of pregnancy dangerous signs in the work area of urban and rural Puskesmas are categorized bad. There is a difference of counseling quality of pregnancy dangerous sign component of vagina bleeding (p = 0.000), severe headache (p = 0.000), visual problems/blurred sight (p = 0.000), swelling on face and hand (p = 0.001), and severe abdominal pain (p = 0.000), fetus movement is lacking or not felt (p = 0.000) and fever (p = 0.000).

CONCLUSION: There is no difference in counseling quality based on age, education, job, and parities.

Introduction

Maternal and child health is a matter of public health. This is referred to in the global concessions of the millennium development goals (MDGs) and also continued in Sustainable Development Goals (SDGs) [1]. The maternal mortality rate in Indonesia is quite high, based on 2012 IDHS data, the maternal mortality rate is 359/100,000 live births [2].

Data on visits to care can be a reference for assessing the good quality of services provided by health workers, although there is no agreement on ANC quality assessment indicators [3]. Research in Nigeria shows that only 4.6% of women receive good quality ANC services, while almost 1.0% do not receive one complete component of ANC examination [4]. The patient satisfaction during ANC examination is very important because it influences patients to be more inclined to comply with routine examinations in using primary health services. Research in Bahir showed that 98.9% of respondents were intrapersonally satisfied when examining and consulting [5].

The problem of ANC services in Indonesia is almost the same as in other developing countries. Such an incident in Sub-Saharan Africa shows that even though the ANC service coverage is high, it is still followed by a high maternal mortality rate. Hence, this makes Graham assess the gap between the amount of ANC coverage and maternal mortality [6]. Pregnancy complications are one of the causes of the high maternal mortality rate in Indonesia [7]. This complication can occur because the mother does not recognize the danger signs of pregnancy that can cause complications.

The quality of antenatal care services is determined by seven components. One of them is antenatal care counseling. Researching the quality of counseling on pregnancy danger signs is very important to do because this is very closely related to the health of pregnant women. With counseling, pregnant women get a solution to the pregnancy problems that are being

experienced. In this case, the things must be done and which should be avoided during pregnancy so that the counseling component can improve the degree of health of pregnant women.

Based on service coverage data, it shows that the ideal K1 and K4 indicators nationally are 81.6% (Ministry of Health, 2013). However, this data does not indicate the quality of services provided to pregnant women. The regencies/cities with the highest maternal mortality rates include West Sulawesi, NTB, and NTT, which are 90/100,000 KH. This is what puts Indonesia has a maternal mortality rate of 288/100,000 kh from 33 provinces. Moreover, it still has not reached the target of reducing the global maternal mortality rate to <70/100,000 live births [1].

The implementation of the ANC in South Sulawesi K1 and ANC coverage was at least four visits each of 75.9% and 95.7% [8]. However, this high coverage does not guarantee a decrease in maternal mortality in South Sulawesi Province. Jeneponto is one of the areas with health problems which have the highest maternal mortality rate for three years in a row, namely, from 2013 to 2015, with figures of 170, 235, and 170/100,000 KH, respectively [9].

According to the IDHS data on pregnant women who received counseling about pregnancy, danger signs in urban areas amounted to 57.1% and in rural areas amounted to 48.7%. Findings from studies conducted in Norway show that there are many implications that arise, and it is known that the interests of pregnant women from rural areas are low. Therefore, there is a need that counselors must be posted to rural areas of the community to enable them to advise them on the importance of antenatal visits, more counseling must be provided for pregnant women, especially in rural areas to motivate their antenatal interests. Counselors should be more involved in counseling sessions for pregnant women in different hospitals and health centers [10].

Data on the number of pregnant women receiving data counseling services in Jeneponto Regency were unavailable. Moreover, the high maternal mortality rate is caused by complications. Moreover, there is no research on counseling quality in Jeneponto Regency. This is what underlies researchers to conduct research on the quality of counseling services in pregnancy danger signs in the Rural Areas Health Center and Urban Areas Health Centers in Jeneponto Regency 2016. This study aims to compare the quality of counseling for pregnancy danger signs in the Urban Health Centers and the Rural Health Centers in the Regency, Jeneponto.

Materials and Methods

This research was carried out in the Urban Area and Community Health Center in Rural Areas, Jeneponto Regency, South Sulawesi Province. This type of research is observational analytic with a "cross-sectional study" design. The population in this study were all pregnant women in Jeneponto Regency in October 2015–May 2016, amounting to 4156 pregnant women. The data were obtained from the Profile of the Jeneponto District Health Service in 2015. The sample in this study was pregnant women who had visited to utilize counseling services for pregnancy danger signs at the Jeneponto Health Center and met the inclusion criteria, with a total sample of 287 respondents. The inclusion criteria are pregnant women who live in Jeneponto and have visited Puskesmas during the study period.

Data collection is done through direct interview techniques using a questionnaire, and direct observation using a checklist. Secondary data were obtained from the District Health Office of Jeneponto. Data analysis was performed with the SPSS program and statistical tests using univariate tests with frequency and bivariate analysis of the Chi-square test.

Results

The results showed that the distribution of respondents based on characteristics in urban and rural health centers in Jeneponto Regency, by age group, showed that the most respondents were the 17–25 year age group that was 129 people (46.4%), and the lowest was the age group of 12–16 years which was three people (1.1%). Regarding the education of most respondents, there were 95 graduates (34.2%) graduating from junior high school, and the lowest did not graduate from elementary school and graduated from college, respectively, with 17 people (6.1%). Moreover, based on employment it was shown that most respondents were IRT jobs, namely, as many as 263 people (94.6%), and the lowest was in the work of 1 private employee (0.4%) (Table 1).

Table 1: Distribution of respondents based on characteristics in the Puskesmas and midwife practices of Jeneponto regency

Characteristics	Frequency	%
Age (Year)		
12–16	3	1.1
17–25	129	46.4
26–35	121	43.5
36–45	25	9.0
Education		
Not completed in primary school	17	6.1
Graduated from elementary school	90	32.4
Graduated from middle school	95	34.2
Graduated from high school	59	21.2
Graduated from college	17	6.1
Not completed in primary school	17	6.1
Occupation		
IRT	263	94.6
Entrepreneur	9	3.2
Civil servants	5	1.8
Private employees	1	0.4

The counseling status of respondents showed that most respondents did not get counseling as many as

143 people (51.4%), while those getting counseling were 135 people (48.6%) (Table 2). The results of counseling quality research related to respondents' knowledge in urban and rural health centers showed that the highest quality of counseling related to poor quality as many as 237 people (85.3%), while those getting good quality counseling were 41 people (14.7%) (Table 3).

The results of the bivariate analysis between the quality of counseling knowledge with the counseling component showed that respondents who did not receive counseling related to vaginal bleeding and had poorer quality were 159 patients (91.9%).

Table 2: Frequency distribution of respondents based on counseling status at the Puskesmas and midwife practices in Jeneponto regency

Counseling	Frequency	%
Yes	135	48.6
No	143	51.4

Statistical test results indicate that there is a difference in the quality of counseling on pregnancy danger signs related to vaginal bleeding counseling in rural and urban health centers (p = 0,000) (Table 4).

Table 3: Frequency distribution of respondents based on ANC service quality at the Puskesmas and midwives in the practice of Jeneponto regency

Kualitas Pelayanan ANC	Frekuensi	%
Kualitas Baik	41	14.7
Kualitas Buruk	237	85.3
Total	278	100.0

The counseling component related to pain/ headache which is severe and has more poor quality is 197 patients (93.4%). Statistical test results show that there are differences in the quality of counseling on pregnancy danger signs associated with severe pain/headache counseling in rural and urban health centers (p = 0,000). Respondents who did not receive counseling related to visual problems/blurred vision and had more poor quality were 195 patients (93.3%). Statistical test results show that there is a difference in the quality of counseling on pregnancy danger signs related to counseling on visual/blurred vision problems in rural and urban health centers (p = 0.000) (Table 4).

Table 4: ANC quality analysis based on ANC components in the Jeneponto district health center and midwife practice

Variable	Quality				Total		p
	Good		Poor		n	%	
	n	%	n	%			
Vaginal bleeding							
Yes	27	25.7	78	74.3	173	100	0.000
No	14	8.1	159	91.9	105	100	
Severe headaches							
Yes	27	40.3	40	59.7	67	100	0.000
No	14	6.6	197	93.4	211	100	
Visual problems/blurred vision							
Yes	27	39.1	42	60.9	69	Ya	0.000
No	14	6.7	195	93.3	209	Tidak	
Swelling on face and hands							
Yes	25	23.4	82	76.6	107	100	0.001
No	16	9.4	155	90.6	171	100	
Abdominal pain is severe							
Yes	25	26.0	71	74.0	96	100	0.000
No	16	8.8	166	91.2	182	100	
Fetal movement is lacking or not felt							
Yes	25	36.8	43	63.2	68	100	0.000
No	16	7.6	194	92.4	210	100	
Severe headache							
Yes	26	41.9	36	58.1	62	100	0.000
No	15	6.9	201	93.1	216	100	

The counseling component related to swelling on the face and hands that have poor quality is more than 155 patients (90.6%). Statistical test results show that there is a difference in the quality of counseling on pregnancy danger signs associated with swelling in the face and hands counseling in rural and urban health centers (p = 0.001). Respondents who did not receive counseling related to severe abdominal pain and had more poor quality were 166 patients (91.2%). Statistical test results show that there is a difference in the quality of counseling on pregnancy danger signs associated with counseling. Abdominal pain is severe in rural and urban health centers (p = 0.000) (Table 4).

Respondents who did not receive counseling related to fetal movements were less or not felt and had more poor quality, that is, 194 patients (92.4%). Statistical test results show that there are differences in the quality of counseling on pregnancy danger signs related to counseling. Fetal movement is less or not felt in rural and urban health centers (p = 0.000). Respondents who did not receive counseling related to severe headaches and had more poor quality were 201 patients (93.1%). Statistical test results show that there is a difference in the quality of counseling on pregnancy danger signs associated with counseling severe headaches in rural and urban health centers (p = 0.000) (Table 4).

Discussion

The results of this study indicate that most respondents are the age group of 17–25 years, which are 129 people (46.4%), and the least is the age group of 12–16 years as many as 3 people (1.1%). Regarding education, the highest number of respondents was at junior high school level of 95 people (34.2%), and the lowest was not graduated from elementary school and graduated from college, respectively, as many as 17 people (6.1%).

Based on the results of this study, most respondents indicated that most respondents were IRT jobs, namely, 263 people (94.6%), and the lowest was the employment of 1 private employee (0.4%). Regarding counseling status, the majority of respondents did not receive counseling, namely, 143 people (51.4%) and 135 people (48.6%). Moreover, research shows that respondents who are not counseling and have more poor quality are 130 patients (90.9%).

Health workers, in this case midwives, should provide a complete component of the danger signs of pregnancy when pregnant women make the first contact of pregnancy. This is because, if information about danger signs of pregnancy is not given early in pregnancy, fatal things for the mother and fetus can occur. In this case, it is possible at the time of dizziness for pregnant women to only consider it a natural

thing and ignore the headache until it continues to a dangerous stage.

This study stated that all components of pregnancy danger signs showed a significant relationship with the quality of maternal knowledge related to counseling ($p < 0.05$). The respondents who received counseling related to vaginal bleeding (continuous blood spots during pregnancy) were as many as 105 people (37.8%), received counseling related to severe pain/headache (persistent and persistent headaches despite resting) were 67 people (24.1%), counseling related to visual problems/blurred vision (have a rest but the eyes remain blurred) were as many as 69 people (24.8%), get counseling related to swelling on the face and hands (symptoms experienced at 7–9 months gestational age and blood pressure above normal) were as many as 107 people (38.5%).

Counseling related to severe abdominal pain (severe abdominal pain and not stopping after rest) as many as 96 people (34.5%), get counseling related to fetal movements less or not felt (fetuses move at least 3 times in 3 hours, and fetal movements are felt at gestational age 16–20 weeks) as many as 68 people (24.5%) and get counseling related to severe headaches (headaches from preeclampsia symptoms and headaches still felt after resting) as many as 62 people (22.3%).

The most remembered danger sign among respondents in both study groups was vaginal bleeding, and this is in line with findings from rural Zambia. Vaginal bleeding is also the most advising danger sign in a study that focused on counseling and awareness of women of pregnancy danger signs at selected rural health facilities in Africa.

Research conducted by Hailu [11] in Ethiopia shows that pregnant women who get the danger signs of pregnancy bleeding vaginal bleeding (45.9%), severe headaches/pain (7.4%), facial swelling and hands (3.2%), severe abdominal pain (7.0%), and fetal movements are less or not felt (4.7) and high fever (9.2%).

This research shows that pregnant women who know about the components of danger signs of pregnancy are very minimal. Among the seven components of standardized danger signs of pregnancy, only a few pregnant women receive these components. This is due to many factors, one of which is the tendency of health workers (midwives) to not give full counseling about the danger signs of pregnancy. Midwives only explain pregnancy danger signs as complained by pregnant women even though counseling is a complete danger sign of pregnancy to pregnant women at the first visit (K1).

The limited-time of service and the lack of health workers is one of the reasons health workers do not explain in full the components of pregnancy danger signs to pregnant women at the first visit (K1). Encouraging reading the KIA book is an option for midwives.

Recommendation

Based on this study, all components of pregnancy danger signs are significant with the quality of knowledge related to counseling. Therefore, health workers, in this case midwives, should do more innovative and comprehensive counseling for pregnant women so that fatal things for mothers and fetuses can be avoided.

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Quality of Antenatal Care at Urban and Rural Puskesmas (Public Health Center) in Jeneponto Regency

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Abstract

BACKGROUND: Increased coverage antenatal care (ANC) occurring in developing countries do not guarantee the success of the ANC, it is because a high rate of maternal and neonatal mortality associated with inadequate and poor quality of maternal care, including ANC.

AIM: This study aimed to find out the differences in the quality of ANC in rural and urban primary health centers in Jeneponto Regency.

METHODS: This research aims to determine the different quality of ANC at urban and rural puskesmas (public health center), Jeneponto regency. The type of the research was observational analysis with cross-sectional design. There were 139 fixed samples of rural and urban pregnant women visiting the puskesmas, from October 2015 to May 2016. The samples were selected using stratified random sampling method from two puskesmas of each area.

RESULTS: The results indicate that 52.6% of ANC quality is categorized bad. There is different ANC quality based on body weight, the height of fundus uteri, and administration of Fe tablet (0.038, 0.029, and 0.006). There is no difference of antenatal quality based on body height, LILA, fetus' heartbeat, fetus presentation, blood type and Hb, and immunization of TT (0.068, 0.501, 1.000, 1.000, 0.133, 0263, and 0530). Blood pressure is not analyzed.

CONCLUSION: There are three components that show differences in rural and urban health centers, namely, weight measurement, fundal height measurement, and FE tablet administration. As for the components of height measurement, assessment of nutritional status (MUAC), fetal presentation, examination of fetal heart rate, administration of TT immunization, and examination of blood type and hemoglobin. The component of blood pressure measurement was not included in the statistical test because all respondents received the examination.

Introduction

Increasing the quality of service coverage must be done to reduce maternal mortality, in Tanzania 94% of women make ANC visits and 54% do so with four visits. However, this is precisely in line with the increase in maternal mortality [1]. This shows that the quantity of coverage does not fully indicate the quality of service. In India, national survey results show that incentive programs for mothers and health institution workers as an increase in service coverage [2], [3]. This has not been matched by efforts to monitor and improve the quality of childbirth services so that it impacts on the unclear survival of mothers and babies [4].

Based on the previous exposure, it is known that improving health services have not been able to reduce maternal mortality rates so that adequate intervention is needed. There are two interventions that can be done in reducing the mortality rate, namely, antenatal care (ANC) and intrapartum services (labor and birth). The essence of the ANC is preparing births for women and making them parents, preventing problems in women, pregnant women, and infants with early detection, eradication, and management of problems that affect the mother and baby during pregnancy [5]. Inadequate ANC services, both coverage and quality, will result in poor pregnancy outcomes [6].

Utilization of ANC services varies between countries based on the lack of utilization of ANC services in pregnant women in Asian and African countries with low incomes [7]. In a country, utilization of ANC services differs in maternal age, education, employment, family income, parity, residence, costs, and availability of health facilities [8], [9], [10], [11]. Based on the region of residence, several studies show that urban women visit ANC more often than rural women. Research conducted by Fekadu and Regassa [12] looked at the quality of ANC utilization programs in Ethiopia describing 15.6% of mothers living in urban areas receiving good services compared to in rural areas only 4.5% of mothers receiving good service quality due to

lack of skilled health workers. Other research shows that there is no difference in the use of ANC services in urban and rural areas [13], [14].

In Indonesia, pregnant women can obtain ANC services in various health facilities, namely, Puskesmas, Posyandu/Polindes, Hospitals, Maternity Homes, Doctors/Clinical Practices, and midwives practice [15]. Health facilities are provided to increase the coverage of maternal health services. Based on the Republic of Indonesia Ministry of Health's Report (2013), almost all pregnant women in Indonesia (95.4%) had already pregnancy check (K1) and the frequency of pregnancy at least 4 times during her pregnancy was 83.5%. The coverage of the first pregnancy check-up in the first trimester is 81.6% and the ANC frequency is 1-1-2 or K4 (at least 1 time in the first trimester, at least 1 time in the second trimester, and at least 2 times in the third trimester) by 70.4%. However, this shows that the high coverage has not yet fully demonstrated the quality of ANC services.

Based on the results of the Riskesdas of South Sulawesi [16] Puskesmas/Pustu were the most visited places for pregnant women during ANC (51.1%), practice midwives (17.4%), and Poskesdes/Polindes (10.6%). Puskesmas categories by region are divided into puskesmas in urban areas, rural areas, and remote and very remote areas (Permenkes RI No. 75, 2014). In Jeneponto, puskesmas only consist of puskesmas in urban and rural areas. Urban health centers include Binamu Health Centers, City Binamu Health Centers, and City Bontosunggu Health Centers. Rural health centers include Bontomate'ne Puskesmas, Bululoe Puskesmas, Tamatea Puskesmas, Bontoramba Puskesmas, Bangkala Puskesmas, Kapita Puskesmas, Buludoang Puskesmas, Barana Puskesmas, Torana Puskesmas, Toro-Toro Puskesmas, Barana Puskesmas, Tino Puskesmas, Arungkeke Puskesmas, Kapita Puskesmas, Buludoang Puskesmas, Barana Puskesmas, Toro-Toro Puskesmas, Barana Puskesmas, Toba Puskesmas, Arungkeke Puskesmas, Arungkeke Puskesmas, Tolo Puskesmas, Barolo Puskesmas, Barolo Puskesmas, Tolo Puskesmas, Puskesmas Tompo Bulu, and Puskesmas Rumbia.

Jeneponto is one of the areas in South Sulawesi which is a health problem area (Riskesdas, 2014). In the last 3 years, the trend of maternal mortality has fluctuated, successively from 2013 to 2015 with figures of 170, 235, and 170/100,000 live births, DEPES Jeneponto, 2015). However, this is inversely proportional to the coverage data K1 and K4 which are quite good. In 2013, k1 and k4 coverage, coverage of deliveries assisted by Nakes was 97.6%, 89.8%, and 88.6%, respectively. In 2014, k1 and k4 coverage, coverage of deliveries assisted by Nakes was 97.8%, 84.7%, and 86.6% whereas in 2015, coverage of k1 and k4, coverage of deliveries assisted by Nakes, respectively, 100.4%, 87.0%, and 96.2% (DEPES Jeneponto, 2015). Seeing this, further investigation is needed regarding the quality of ANC services in Jeneponto Regency.

Materials and Methods

This research was carried out in the Jenponto District Health Centers. This type of research is observational analytic with cross-sectional design. The population in this study was pregnant women visiting the puskesmas from October 2015 to May 2016, as many as 4156 pregnant women. The puskesmas included in this study were randomly selected where out of the eighteen puskesmas in Jeneponto there were three urban puskesmas and 15 rural puskesmas.

The selected urban area health centers are Binamu City Health Centers and Binamu City Health Centers, while the selected rural area health centers are the Bonto Matene Health Center and the Bonto Ramba Health Center. The sample in this study was pregnant women who visited to use ANC services in the Jeneponto health center and met the inclusion and exclusion criteria. Based on the sample calculation above, the total sample of each puskesmas in rural and urban areas is 139 pregnant women and the total sample is 278 pregnant women. The number of samples drawn from each puskesmas was carried out using stratified random sampling technique. Secondary data were obtained from data on visits of pregnant women from the Jeneponto District Office recapitulation. Primary data obtained from direct observations in the field. Data analysis was performed using the SPSS program and statistical tests using bivariate tests.

Results

The results showed that the majority (29%) of respondents were in the 20–24 years group, following the 25–29 years age group, and the smallest were in the ≥ 40 years group. Based on education, half of the respondents (48%) only completed elementary school education (48%), there were 26% respondents who completed high school education, while the least were respondents who graduated from college. Based on gestational age, most respondents were in the third trimester of pregnancy (49.35), and then those in the second trimester (38.5%) and the least were respondents in the first trimester (12.2%) (Table 1).

The quality assessment in this study was divided into good quality, minimum quality, and lack of quality (Table 2). The results showed that the highest percentage was in rural health centers with the category of poor quality as many as 95 respondents (65.1%).

Table 1: Distribution of respondents based on characteristics

Karakteristik	Frekuensi	%
Age (Year)		
≤19	32	11
20–24	79	29
25–29	65	23
30–34	44	16
35–39	47	17
≥40	11	4
Education		
Not completed in primary school	24	9
Graduated from elementary school	132	48
Graduated from middle school	40	14
Graduated from high school	73	26
Graduated from college	9	3
Gestational age		
Trimester I	34	12.2
Trimester II	107	38.5
Trimester III	137	49.3

For the minimum quality category, the quality of ANC in urban health centers (66.7%) is higher than in rural areas (33.3%). Statistical test results showed that there were differences in ANC quality based on rural and urban health centers (p = 0.000).

Table 2: Antenatal care quality analysis based on Puskesmas in rural and urban areas in Jeneponto regency

Quality of ANC	Puskesmas in Urban		Puskesmas in Rural		Total		p-value
	n	%	n	%	n	%	
Good quality	6	33.3	12	66.7	18	100	0.000
Minimum quality	38	33.3	76	66.7	114	100	
Low Quality	95	65.1	51	34.9	146	100	

In this study, the components of pregnancy examination consisted of 11 components, namely, height measurement, weight measurement, nutritional status assessment (LILA), fundal height measurement, blood pressure measurement, fetal presentation, examination of fetal heart rate, giving TT immunization, giving FE tablets, and examination of blood type and hemoglobin (Table 3). The results showed that of the 11 components, there were three components that showed differences in rural and urban health centers, namely, weight measurement, fundal height measurement, and FE tablet administration. As for the components of height measurement, the assessment of nutritional status (MUAC), fetal presentation, examination of fetal heart rate, administration of TT immunization, and examination of blood type and hemoglobin. The component of blood pressure measurement was not included in the statistical test because all respondents received the examination.

Respondents who did not get the highest height measurement services were in the Community Health Center in 104 people (53.9%). Statistical test results showed that there was no difference in ANC quality based on height measurements in rural and urban health centers (p = 0068). Respondents who received the highest weight measurement services were in the Community Health Center as many as 104 people (54.5%). Statistical test results showed that there were differences in ANC quality based on weight measurements in rural and urban health centers (p = 0.038). Respondents who did not get the highest nutritional status measurement (LILA) service were in the Community Health Center in 104 people (51.5%). Statistical test results showed that there was no difference in ANC quality based on height measurements in rural and urban health centers (p = 0.501) (Table 3).

Table 3: ANC quality difference analysis based on pregnancy examination components in Jeneponto District and rural health centers

Components of pregnancy checking	Puskesmas in urban		Puskesmas in rural		Total		p-value
	n	%	n	%	n	%	
Height measurement							
Yes	50	58.8	35	41.1	85	100	0.068
No	89	46.1	104	53.9	193	100	
Weight measurement							
Yes	104	54.5	87	45.5	191	100	0.038
No	35	40.2	52	59.8	87	100	
LILA measurement							
Yes	41	53.9	35	46.1	76	100	0.501
No	98	48.5	104	51.5	202	100	
Uterine fundus height measurement							
Yes	125	53	111	47	236	100	0.029
No	14	33.3	28	66.7	42	100	
Blood pressure measurement							
Yes	139	50.0	139	50.0	278	100	-
No	0	0	0	0	0	100	
Fetus presentation							
Yes	95	50.3	94	49.7	189	100	1.000
No	44	49.4	45	50.6	89	100	
Fetal heart rate examination							
Yes	95	50.3	94	49.7	189	100	1.000
No	44	49.4	45	50.6	89	100	
Tetanus immunization							
Yes	52	53.1	46	46.9	98	100	0.530
No	87	48.3	93	51.7	180	100	
Provision of FE tablets							
Yes	87	44.4	109	55.6	196	100	0.006
No	52	63.4	30	36.6	82	100	
Blood type examination							
Yes	12	70.6	5	29.4	17	100	0.133
No	127	48.7	134	51.3	261	100	
Inspection of Hb							
Yes	46	45.1	56	54.9	102	100	0.263
No	93	52.8	83	47.2	176	100	

Respondents who received the highest fundus uteri height measurement services were in the Community Health Center as many as 125 people (53%). Statistical test results showed that there was a difference in ANC quality based on the measurement of uterine fundus height in rural and urban health centers (p = 0.029). Respondents who received fetal presentation services as well as examining the highest fetal heart rate were in the Community Health Center in 95 people (50.3%). Statistical test results showed that there was no difference in ANC quality based on fetal presentation in rural and urban health centers (Table 3).

Respondents who received the highest FE tablet delivery services were in the Community Health Center in 109 people (55.6%). Statistical test results showed that there were differences in ANC quality based on FE tablets in rural and urban health centers (p = 0.006). Respondents who did not get the highest blood type examination services were in the Community Health Center in 127 people (51.3%). Statistical test results showed that there was no difference in the quality of the ANC based on blood type examination in rural and urban health centers (p = 0.133). Respondents who did not get the highest blood type examination

services were in the Community Health Center in 127 people (51.3%). Statistical test results showed that there was no difference in the quality of ANCs based on blood type examinations in puskesmas in rural and urban areas (p = 0.133) (Table 3).

Discussion

This study found that 52% of pregnant women received poor ANC in Jeneponto District, 51% received minimum ANC, and only 6.4% received good ANC. Poor quality of ANC for pregnant women assumes that getting a pregnancy check under six components based on gestational age, is said to be of minimum quality if the mother gets seven or eight components, and is said to be of good quality if all components of ANC are fulfilled according to the gestational age. Ideally, pregnant women receive minimum ANC based on their gestational age. However, this study found that the percentage of pregnant women who received minimum and bad services was almost the same.

The high percentage of pregnant women who receive poor quality services is due to some components of the examination that was not given to pregnant women at the time of the examination at the puskesmas and there was a statement from the official that the component was not provided on the grounds that the regent stock was depleted.

Based on the 11 components of ANC that was linked in this study, only three components showed that there were differences in the provision of the examination components in puskesmas in rural and urban areas. The three components are weight, fundal height, and FE tablets.

Body weight measurements should ideally be given at each pregnancy check-up visit. However, this study found that weight measurements at rural health centers were better than urban health centers. This means that the distribution of weight measurement components is uneven in Jeneponto Regency. Based on field observations related to body weight measurements, the tools used during pregnancy checks in all puskesmas use manual body scales. The result of the interview with the midwife in charge stated that the scales were a division tool from the center and they did not pay attention to the effectiveness of the tools.

The study also found that there were differences in the provision of FE tablets in rural and urban health centers. The results of the same study conducted in Nigeria Ajayi [17] found that there were differences in the administration of FE tablets in villages and cities. In this study, administration of FE tablets was higher in urban health centers than in rural health centers. Ideally, pregnant women get 90 tablets during pregnancy. However, in this study, as many as, 30% of respondents did not get FE tablets. The results of interviews with health workers stated that the FE tablet was adjusted to the condition of pregnant women when visiting the health center. If pregnant women come with a yellow/pale face, with complaints of nausea/vomiting in trimesters II and III, then given a 10-strip FE tablet. Besides, the provision of FE tablets also adjusted to the presence or absence of logistics available at the time although FE tablets should be given from the first contact with pregnant women and given at least 90 tablets during pregnancy. The administration of FE tablets is different for each gestational age, that is, 1000 mg during a total pregnancy. The need for iron in trimesters II and III cannot be fulfilled from food alone, although the food eaten is of good quality and high bioavailability of iron, but iron must also be supplied from other sources to be sufficient. Giving FE tablets to pregnant women can reduce the proportion of anemia because it increases hemoglobin in the blood up to 0.7 g/dl every week [18].

This study found that in both rural and urban health centers, height measurements had no difference. This is because the tendency for height checks is only done during the first visit of pregnant women at the puskesmas. The results of interviews with health workers stated that because their height did not change in the near term so they only did height checks at the first visit of the pregnant women both at the time of the mothers with gestational age trimester II and trimester III. This is in accordance with the provisions Ministry of Health RI [19] that height measurements are only carried out at the first visit of pregnant women.

Similar to height measurement, this study found that the measurement of nutritional status (LILA) in both rural and urban health centers did not have a difference. This is because the measurement of LILA is only done at the first visit of pregnant women, while the number of respondents in this study was mostly in the second and third trimester of pregnancy (87.8%). The results of the study by Ververs [20] show that measurement of MUAC in pregnant women is an indicator of protein-nutrient deficiency, especially if height and weight measurements are not carried out.

Blood pressure is a component of the examination carried out 100% both in rural and urban health centers so that there is no bivariate analysis. This shows that the most routine component in the puskesmas is a blood pressure check. The results of the same study conducted in Nigeria by Fagbamigbe and Idemudia [2] and in Tanzania by Sarker [21] that blood pressure testing is the most frequent component of ANC for pregnant women (91%). If related to the use of tools that are in accordance with the standards, there is one health center that does not use blood pressure measuring instruments with mercury indicators.

Examination of uterine fundus height, fetal heart rate and fetal presentation are examinations of

the abdomen in pregnant women. In this study found that examination of fundal uterine height in rural and urban health centers had differences, while examination of fetal heart rate and fetal presentation did not have differences in the two regions. The difference in the two regions in the examination of the fundus uteri height is due to the highest examination in puskesmas in rural areas. The results of a different study conducted by Ajayi [17] found that abdominal examination in pregnant women did not have a difference either in the village or in the city. However, the abdominal examination in the study included the three examinations of uterine fundus height, MUAC, and height not by differentiating between examinations. There is no difference in examination of fetal presentation and fetal heart rate in the two regions because most examinations are performed starting at the end of the second trimester. The official stated that in general the fetal heart rate can only be felt at 20 weeks gestation.

Tetanus toxoid administration was also included in the component that had no difference in both rural and urban health centers found in this study. The absence of this difference is due to the tendency of this examination to be varied at each gestational age of pregnant women. In this case adjusted for the interval of TT immunization. However, if the pregnant woman forgets the last time she did the TT immunization, and then the immunization will be repeated to TT1. The results of a different study conducted by Ajayi [17] found that there were differences in the administration of TT injections in villages and cities in Nigeria. Giving TT injections is higher than in cities.

In this study, laboratory examination only included two tests, namely, examination of hemoglobin blood type. Both are examination components that have no difference in both rural and urban health centers. Blood type examination is the component of the examination that is most rarely given to pregnant women. This is because most pregnant women already know their blood type and the existence of a health center that does not provide these components.

Hemoglobin examination in rural and urban health centers is done if pregnant women come with an indication that the face is pale/yellowing so that during observation, not all pregnant women are given these components. The results of a different study conducted in Nigeria by Ajayi [17] found that there were differences in hemoglobin examinations in rural and urban areas where examinations in urban areas were more adequate and complete.

A smaller decrease in hemoglobin level during pregnancy from early to mid-pregnancy or at the end of pregnancy is associated with LBW infants, Z-score birth weight, placental weight, and placental ratio [22] Decreased hemoglobin in the blood causes anemia in pregnant women. Severe anemia from early pregnancy is also associated with poor birth, for example, LBW [23].

Recommendation

There is a need for equitable delivery of components of ANC in both rural and urban health centers by providing training and knowledge about ANC to midwives concerned.

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Evaluation of the Application of Health and Safety Management System (SMK3) in the Mining Company of PTX. Based on Government Regulation Number 50 of 2012

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Abstract

BACKGROUND: Occupational safety and health management systems, hereinafter, in SMK3 are part of the overall company management system in the context of risk control related to work activities to create a safe, efficient, and productive workplace through efforts to prevent accidents and occupational diseases.

AIM: This study aimed to evaluating the application of occupational safety and health management systems to contractors in the management area of PT Sims Jaya Kaltim based on government regulation number 50 of 2012.

METHODS: The application of SMK3 is mandatory for companies with 100 employees or high risk. The evaluation research using the culinary method adopted a countenance stake evaluation model with three stages, starting with the antecedents, Transaction, and outcomes stages, in three mining companies. Data collection uses source pole, interviews, document review, and observation.

RESULTS: The results of this study indicate the results of evaluating the implementation of an occupational safety and health management system at the Attendance (Input) stage in PT X based on government regulation number 50 of 2012, included in the less category where the value obtained is 55%. The results of the evaluation of the application of an occupational health and safety management system at the stage of transaction in X based on government regulation number 50 of 2012 are included in the satisfying category where the value obtained is 86%, while the outcomes obtained a value of 70.5% in the less category. PT Mandiri Herindo Adiperkasa and PT Iwaco Jaya Abadi are expected to further enhance the application of occupational safety and health management systems.

CONCLUSION: The results of the evaluation of the implementation of the occupational safety and health management system (SMK3) at the Attendance (Input) stage at PT X based on government regulation number 50 of 2012 are included in the category of lacking where the value obtained is 55%. Transaction phase (Process) is included in the satisfactory category where the value gained 86%. The outcomes phase is obtained 70.5%.

Introduction

The mining industry sector has high potential risks in the process. The number of accidents that occur both in the oil and gas mining sector, as well as the mineral and coal mining sector such as fire, blasting, environmental pollution, and others [1]. Mining operations currently generally carry out their activities by appointing contractor/subcontractor companies which are stated in the mining regulations as a company that has a mining service business permit (IUJP). PT X is one of the IUJP owner companies listed in the directorate general of minerals and coal. The role of the contractor is vital for the mining industry, especially in supporting operational activities. Contractors are directly involved in the implementation of work so that they are more directly exposed to hazards when carrying out work activities than company personnel so that contractor workers are more prone to work accidents [1].

Circular of the directorate general of minerals and coal (mineral and coal) as of July 30, 2018, mentioned, in the period January to July 2018, there were 86 work accidents, in which 38 accidents resulting in serious injuries, 38 minor injuries, and ten fatalities (fatality). Of the 86 accidents, 47.50% occurred in the contractor, 15.00% occurred in the subcontractor, and 37.50% in the owner. The high number of accidents that occur requires contractors and subcontractors to be able to carry out work safely in terms of occupational health and safety. Hence, in this case, each contractor or subcontractor is required to apply a work safety and health management system in accordance with applicable laws and standards, because the performance of the contractor can affect the company's performance both that affects the HSE, productivity, and image of a company [2].

Research conducted by Messah [3] on construction service companies in Kupang City, stated that the ten provisions most widely applied by construction service companies are establishing OHS policies (86.84%), identifying hazards that will occur (84.21%), provide funds for the implementation of K3 (84.21%), determine accident risk control (81.58%), regulations based on legislation on K3 (81.58%), provide sufficient amount of P3K facilities (81.58%), making goals and objectives to be achieved (78.95%), and each party involved in the construction service company must play a role in maintaining and controlling the implementation of K3 (76.32%), there is a division of tasks and responsibilities clear (73.68%) and implementation of controls to manage K3 hazards (73.68%) [3].

Law number 13 of 2003 and government regulation number 50 of 2012, companies that employ 100 employees and or <100 people but who have high risk potential are required to implement an occupational safety and health management system (SMK3).

PT X have 454 employees, based on this reference, PT X has implemented a work safety and health management system since 2015 and received recognition in the form of a certificate from the Ministry of Manpower of the Republic of Indonesia, but PT X accident data in 2018 occurred 10 times with work accidents. This research aims to evaluating the application of occupational safety and health management systems to contractors in the management area of PT Sims Jaya Kaltim based on government regulation number 50 of 2012.

Materials and Methods

This research was conducted at PT. X, located in Paser Regency, East Kalimantan, from May to July 2019. The research used was an evaluation research and evaluation model of Stake countenance by dividing into three stages, namely, antecedents, transaction, and outcomes [4].

The selection of research informants was carried out by purposive sampling with the research informants being those who had the authority, knowledge and were directly involved in the application of Occupational Safety and Health at PT. PT X, namely: The person in charge of the occupational safety and health system in the HSE Department and the Supervisors of each department, who have worked for more than 1 year and understand the system.

Data collection is done by in-depth interviews, observation, and document review. Records of the results of field observation interviews and document review obtained conformity assessments based on the number of criteria in appendix 11 of government regulation number 50 of 2012 (appropriate or not appropriate), then entered into the following formula:

$$\% \text{ of Result} = \frac{\sum \text{Overall criteria} - \sum \text{non} - \text{conforming criteria}}{\sum \text{Overall criteria)}}$$

Evaluation of evaluation results:

1. 0–59% in the bad implementation level category
2. 60–84% in the good application level category
3. 85–100% in the satisfactory application level category.

The results of the in-depth interview were processed using the NVivo. NVivo Application is a computer application program used to help researchers manage and analyze data. NVIVO was developed by QSR International.

Results

This study involved six respondents from each department. There are two elements of an occupational safety and health management system in the antecedents stage, namely, the policy and leadership element and the planning element. Table 1 triangulation of sources for policy elements obtained a value of 53% with less categories, for the planning elements in Table 2, the results of triangulation obtained the source value obtained 57% including the less category.

Table 1: Element triangulation of policy and planning in the mining company

Element	Triangulation	PT X	Results
Policy	Interview	SPY	53%
Planning elements	Review the document	Manual Level I	57%
	Observation Criteria	IJA-SOP-HSE-01	
	Interview	IJA-SOP-HSE-02a	
	Review the document	IJA-SOP-HSE-02b	
	Observation Criteria	IJA-SOP-HSE-02c	
		There are 26 criteria, 14 criteria accordingly and 12 criteria do not match	
		SPY	
		Manual Level I	
		IJA-SOP-HSE-14	
		IJA-SOP-HSE-02a	
		IJA-SOP-HSE-02b	
		IJA-SOP-HSE-02c	
		IJA-SOP-HSE-008	
		There are 14 criteria, 14 criteria are suitable and 6 criteria are not suitable	

The implementation of occupational safety and health management system in the transaction stage consists of ten elements it showed at Table 2 with, namely: (1) Source triangulation for control elements and contract design is 100% obtained, (2) source triangulation for document control elements obtained a value of 100%, (3) source triangulation for

Table 2: Element triangulation of process at The Mining Company

Element	Triangulation	PT X	Results
Contract control and design	Interview	SPY	100%
Document control	Review the document	IMK	71.4%
Purchasing and Product Control Elements	Observation Criteria	IJA-SOP-HSE-14	100%
Working Safety Elements Based on SMK3	Interview	There are eight criteria and all criteria are suitable	100%
Monitoring standard	Review the document	SPY	100%
Reporting and improvement	observation criteria	IJA-SOP-HSE-14	100%
Material Management and Displacement	Interview	There are seven criteria, five criteria are suitable, and two criteria are not	100%
Data Collection and Management	Review the document	suitable	100%
Observation Criteria SMK3 Examination	Observation Criteria	SPY, YSR	0
Skills and Ability Development	Interview	IJA-SOP-PURC-14	92,8%
	Review the document	IJA-SOP-LOG-02	
	Observation Criteria	There are seven criteria and all criteria are suitable	
	Interview	ED, SPY	
	Review the document	IJA-SOP-HSE-12	
	Observation Criteria	IJA-SOP-HSE-13	
	Interview	IJA-SOP-HSE-16	
	Review the document	IJA-SOP-HSE-18	
	Observation Criteria	IJA-SOP-HSE-19	
	Interview	There are 41 criteria and all criteria are suitable	
	Review the document	YSR	
	Observation Criteria	IJA-SOP-HSE-06	
	Interview	IJA-SOP-HSE-10	
	Review the document	IJA-SOP-HSE-34	
	Observation Criteria	IJA-SOP-HSE-19	
	Interview	There are 17 criteria and all criteria accordingly	
	Review the document	SPY	
	Observation Criteria	IJA-SOP-HSE-18	
	Interview	IJA-SOP-HSE-18	
	Review the document	IJA-SOP-HSE-09	
	Observation Criteria	There are nine criteria and all	
		criteria accordingly	
		YSR	
		IJA-SOP-HSE-14	
		IJA-SOP-PURC-01	
		IJA-SOP-HSE-10	
		IJA-SOP-HSE-15	
		IJA-SOP-HSE-12	
		IJA-SOP-LOG-05	
		IJA-SOP-LOG-16	
		IJA-SOP-LOG-17	
		There are 12 criteria and all criteria accordingly	
		SPY	
		IJA-SOP-HSE-07	
		There are six criteria and all criteria are suitable	
		SPY	
		IJA-SOP-HSE-27	
		There are no appropriate criteria	
		SPY	
		IJA-SOP-HSE-03	
		IJA-SOP-HRD-03	
		IJA-SOP-HRD-03	
		There are 14 criteria, 13 criteria are suitable, and one criteria are not	
		suitable	

purchasing elements and product control obtained 100% value, (4) source triangulation for Work Safety Element Based on SMK3 obtained 100% value, (5) triangulation the Monitoring Standards element is rated 100%, (6) triangulation source element reporting and improvement is obtained 100%, (7) triangulation source material management elements and its displacement is obtained 100% value , (8) triangulation of sources the data collection and management elements are obtained 100%, (9) triangulation of sources of SMK3 examination elements obtained a value of 0 no criteria met, and (10) source triangulation the Skills and Capability Development Element based on the triangulation of sources was 92%.

Outcomes phase is the value obtained from the results of the calculation of the antecedents stage and the results of the calculation of the antecedents stage obtained a value of 70.5%.

Discussion

In this stage, there are two elements, namely, policy and value planning obtained at the second stage of PT X, has made a K3 policy in writing, dated, the contents include K3 goals and objectives as well as a written statement of commitment, but do not yet have evidence in the form of minutes of meetings related to policy formulation or policy revision, this is not in accordance with government regulation number 50 of 2012 article seven states that companies in setting policies must pay attention to input from workers, laborers or workers' associations. At PT X also has not yet renewed the organization of the Committee for Safety and Occupational Health as the implementation of K3 in the workplace.

Policy on the main requirements of the management system occupational safety and

health policy is an embodiment of the top leadership commitment which contains the vision and goals of the organization, commitment and determination to implement occupational health and safety, work frameworks, and programs [1]. In line with the Research Zulyanti [5], it is suggested that the K3 Management System is a pattern of applying K3 MPS KUD Tani Mulyo policy which is part of the overall management system of the company. The weakness of the management system has a large role as a cause of accidents, because the management system is what governs the elements of production.

PT X in planning based on the results of risk management according to risk management procedures in the form of hazard identification and risk control (HIRC), which refers to the statutory regulations only the personnel who carry out the HIRC have resigned but the documents have not been revised.

Failure to implement an occupational safety and health management system can be caused because the HIRC process is not carried out properly and comprehensively. The results of the implementation of HIRC are the main inputs in preparing the work plan. PT X has not conducted routine reporting on P2K3 activities in contrast to research conducted by Gemely [6] at PT. Pelindo IV (Persero) Makassar Container Terminal P2K3 activities and programs follow the rules and regulations, namely, the obligation to report quarterly with regard to OSH to the local labor department and annual reports to the central office for evaluation. OHS Program and implementation are delegated to the P2K3 secretary who makes quarterly and annual reports to PT. Pelindo IV (Persero) Makassar Container Terminal.

PT X made a documentation system using a documentation system hierarchy which was arranged into four levels, namely, level 1 for manuals, level 2 for SOPs, level 3 for work instructions/JSA, and level 4 forms. According to Ramli [1], to facilitate the documentation of the occupational health and safety system, a hierarchical OSH document system is used by dividing 4 (four) levels. In line with the research of Yuliani [7] document control at PT Angkasa Pura II (Persero) Bandung is carried out with maintenance and structuring of SMK3 related documents as well as procedures for making and approving documents as well as for handling obsolete documents, recording and management information about the Management and Work Safety System.

PT X conducts hazard monitoring through a five-minute talk (P5M) activity discussing K3 information, both inspection and third hazard report. There are various ways to report unsafe conditions or potential hazards, for example, through workplace inspection results, hazards observation. Prasetyo published that the K3 Inspection Program as an effort to promote OHS Culture in the work environment has been seen from an increase in awareness of the importance of K3 in the work environment and Evaluation of accident trend data continues to decline [8].

In the implementation of P5M, inspection and hazard report is a monitoring so that workers can work with AMA, in line with Research by Wuon [9] where the application of SMK3 in companies that have been carried out in protecting the safety of workers is in the form of procurement of a number of Personal Protective Equipment as a preventative technical effort work accident. In the study of Zulyanti [5] MPS KUUD TaniMulyo as a commitment to the availability of resources, machinery and facilities used have been certified for the proper use. MPS KUD Tani Mulyo also provided support in the form of providing funds for the completion of the K3 annual work program.

Health monitoring is also carried out by PT X by routinely measuring the work environment in collaboration with the hyperkes center, in line with research conducted by Eksis [10] at the Central Post Office in Samarinda City. Through direct measurements, data on temperature and humidity are obtained. Indoor air is 31.110 C and humidity 65.5% RH, this value is outside the provisions of the PUSPERKES standard, the level of lighting in the waiting room is obtained 105.5 Lux data, this data show that the existing lighting level is in accordance with international standards, the assessment of the room noise level is 75.23 dB, which means this room is at a standard.

PT.X in the case of handling materials/materials in the design of storage materials/materials that differ between hazardous and toxic materials and materials that do not contain hazardous and toxic materials, in accordance with Government Regulation Number 50 Year 2012 article 11 paragraph two letter a mentioned, entrepreneurs in carrying out the occupational health and safety plan to take control measures [11].

In line with research conducted by Ratman [12], B3 waste management of PT. Toyota Motor Manufacturing Indonesia adheres to national regulations in Indonesia that have been regulated by KLH through PP. no. 18 of 1999 and PP No. 85 of 1999 and supported by other regulations. B3 waste generated by PT. Toyota Motor Manufacturing Indonesia is IPAL sludge, sludge painting, phosphate sludge, used thinner, used oil, used battery, used waste, used TL lights, used B3 packaging (paint cans, jerry cans, thinner cans, and drums), incinerator ash, and polyclinic waste.

According to Government Regulation number 50 of 2012 article one, SMK3 audit is a systematic examination and the fulfillment of established criteria to measure the results of activities planned and implemented in implementing SMK3 in a company, where PT X's audit has not conducted an audit based on government regulations. In the other research by Istiqlal [13] that the antecedents step are stages of K3 policy and planning determination to SMK3 implementation, the second is transaction with the K3 planning stage gets the appropriate category according to SMK3 and implementation get a category that is not appropriate, and then the output is the stages of K3 monitoring and evaluation get an inappropriate and improvement K3 performance and the

last is the factors influencing the application of K3, namely, supporting factors are documentation; P3K; suitable work environment; objectives and programs implemented; and inhibiting factors are OHS commitment and supervision as well as the non-functioning of specific organizations.

PT Iwaco itself is made a matrix training according to the needs per year. The HRD Department through the training section compiled the matrix. While in the research Zulyanti [5] suggested that the elements of training and competency led the MPS KUD TaniMulyo employees toward competent human resources in the Occupational Health and Safetyfield. MPS KUD TaniMulyo is committed to providing competent resources to achieve the goal of applying Occupational Health and Safetypolicy. This is proven the company conducts training to develop its human resources in the field of occupational health and safety both internally conducted by the company itself and externally from PT. HM Sampoerna or with related institutions and competent actors. While in Andriyanto research [14] suggested that employees be given training related to occupational health and safety.

Recommendation

The application of the management system at PT X should be made in an integrated manner so that the documentation system is easy and also as the basis for implementing the management system. PT X must also form a P2K3 organization based on legal regulations.

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Related Health Service Provider with Mental Health during Pregnancy

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Abstract

BACKGROUND: Mental illness or mental health problems during pregnancy in low- and middle-income countries are very high; the average prevalence reaches 15.6%. Subsequent research was conducted by Indian in the Jakarta and Bogor regions in the period January–June 2018 regarding the incidence of perinatal depression by 23.6% in the Bogor.

AIM: This study aimed to evaluate the mental illness or mental health problems during pregnancy in low- and middle-income countries.

METHODS: This research is qualitative research. This research was conducted in January–June 2019 in the Bogor independent practice midwife. Informants in the study came from the East Jakarta Health Office, Chair of the Indonesian Midwives Association, Head of the Health Center, Coordinating Midwives, Pregnant Women and husbands, and families of pregnant women. Data are analyzed by Regression Logistic.

RESULTS: Construction model mental health of mothers during pregnancy in independent practice midwives is very important and needs attention. Pregnancy is still considered a physical change that needs to be intervened because it is easier to handle and easily detects it. Maternal examination during pregnancy is carried out by midwives, in the implementation of mental health checks during pregnancy for pregnant women, this role has not all been carried out optimally.

CONCLUSION: This research suggests conducting socialization with midwives as well as across-related sectors to get political support in carrying out activities in health facilities and independent practice midwives.

Introduction

Mental illness during pregnancy is a public health problem that should be addressed seriously. Around 10–20% of women in the world experienced mental health problem during the 1st year following the labor. The common mental illness experienced by women include antenatal and postnatal depression, obsessive-compulsive, post-trauma stress, and postpartum psychosis [1]. The prevalence of mental illness or mental health problem during pregnancy in low-income countries reached 15.6% [2]. One of five women experienced mental health issues during pregnancy, such as depression, acute anxiety, and fear toward labor, and mild-to-moderate emotional disorders [3]. Depression and anxiety are common during pregnancy. The prevalence rate of 6% and 17% have been reported for major and minor depression, respectively [4]. Meanwhile, the prevalence rate of anxiety symptom is reported for 23% due to change in appearance which affects self-efficacy [5], and 15% for anxiety during antenatal period due to the feeling of unworthiness caused by pregnancy [6].

According to the World Health Organization, around 10% of pregnant women and 15% of postpartum women experienced mental illness, especially depression. The prevalence rate is even higher in developing countries, that is, 15.6% during the pregnancy and 19.8% following the labor [7].

Some studies were focused on decreasing the effect of pregnancy on mental health – psychology, stress and depression, knowledge, empowerment, and self-efficacy by improving the quality of pregnancy examination with antenatal care. Health workers are responsible to provide education on the psychosocial condition of pregnancy to pregnant women [8]. Besides, additional care during pregnancy should also be provided by health workers (obstetric, midwife, and nurse). This attempt is needed to foster empathy among the health workers and encourage pregnant women to check their condition, which in the long term will decrease the adverse psychological condition during the pregnancy, following the pregnancy and child care [3].

Mental health problem and other issues during pregnancy can be dangerous for pregnant women and their children. The children might experience premature birth, low birth weight, and others. In addition, social stigma,

low self-efficacy, and negative perception will encourage pregnant women to visit health facilities [9], [10].

The prevalence rate of depression during pregnancy in Indonesia has reached 22.4% that may increase the morbidity and mortality rates of mother and children during the pregnancy and postpartum periods [11]. Mental health problems caused adverse effects to the pregnancy and the baby [12].

Materials and Methods

This study is quantitative research with explorative primary data approach. Interview is conducted with subject research 168 women pregnant at Bogor of mental health in pregnant women and the members of Indonesian midwives' branch associations to reveal the cause-effect finding. Samples were taken using an accidental sampling technique. Research time around January–April in 2019. Data analysis is carried out by regression Logistic approach analysis.

Results

Related midwife as a health service provider with on mental health during pregnancy

Through Figure 1, it can be stated that the magnitude of the t-statistic value of self-esteem for maternal mental health during pregnancy is 2309, while for self-efficacy for maternal mental health during pregnancy is 1281, midwife support for mental health is 1996, midwife support for self-efficacy of 1302, community support among pregnant women for maternal mental health of 1167, support of fellow pregnant women for self-efficacy of 1487, support of fellow pregnant women for self-esteem by 1519, family support for self-efficacy by 1519, family support for self-esteem by 1202, husband's support for self-efficacy was 1628, and husband's support for self-esteem by 1986. It can be concluded that all t-values are significant at a minimum of 75% CI.

Discussion

Health-care provider in this case midwives and pregnant women themselves often have difficulty identifying symptoms of mental disorders during pregnancy. The high number of women who associate symptoms of antenatal and postnatal depression with "normal responses" indicates that for pregnant women, at least, the signs and symptoms of mood disorders are often indistinguishable from other typical behaviors and experiences. This seems to be supported by the findings of this study that the cause of mental disorders most often identified during the perinatal period is a factor that is directly related to pregnancy (or becoming a mother) itself [13], [14].

If pregnant women feel confident, feel confident, and convince themselves to be able to

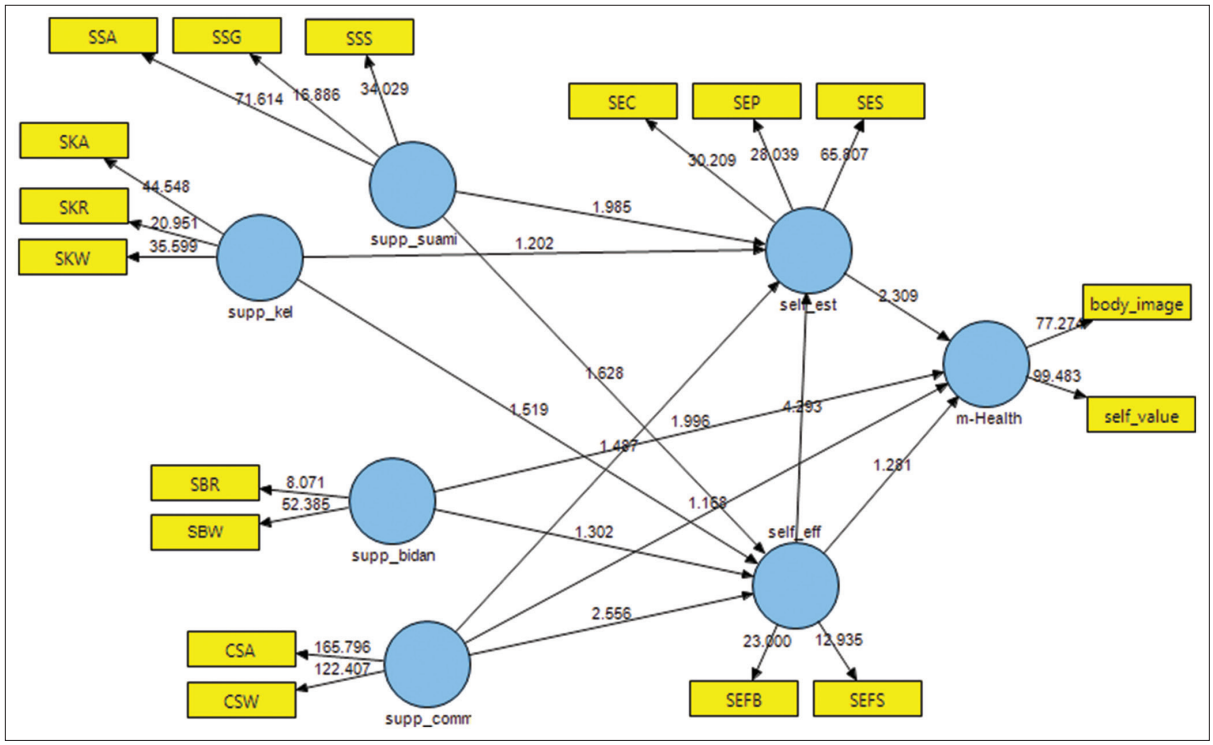

Figure 1: Output final structural model (after bootstrapping)

be in line with mental health in pregnant women so they can get through the well pregnancy. Strategic implementation that must be carried out in the future is that the government program focuses on health development goals to reduce maternal mortality. The available programs are still not focused on psychosocial issues and their impacts as well. Psychosocial aspects of pregnant women play an important role in the well-being of mothers and fetuses, especially in primigravida mothers who have no experience. Maternal and fetal well-being can be achieved if the mother optimally adapts during pregnancy. Therefore, the prevalence of pregnancy disorders and influencing factors is very important to identify the solution and prevent future adverse effects [15].

To improve mental health services for pregnant women, it is important to develop community mental health services, including appropriate training and supervision. Training, hiring, and supporting midwives can help improve mental health service skills at LMICs. One of the main obstacles to improving mental health services in primary care settings is the low number of trained health workers trained in providing mental health-care mothers. An assessment of the need for mental health training for midwives shows the lack of training on mental health issues related to pregnancy and childbirth.

To facilitate this, the future midwives must have maternal health literacy during pregnancy, focusing on several other areas related to perinatal mental health. First, understanding more about mental health literacy associated with perinatal mental disorders, as well as increasing social support. For this purpose, investigating the mental health literacy of health workers such as midwives as well as partners and women's families can provide useful information. Second, the findings of this study seem to indicate that some differences might exist between perceptions of perinatal and non-perinatal mental disorders, which require further exploration [16].

Conclusion

There is a relationship between the role of health providers and mental health of pregnant women. Pregnant women need social support from their health workers. Hopefully, with the support of health workers, they can improve their self-efficacy and self-efficacy so that pregnant women can appreciate their role and can be sure and trust the capabilities of pregnant women. There is a balance between overall physical and mental health.

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Seaweed Farmers and Work Fatigue: A Mixed-Method Approach

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Abstract

BACKGROUND: In Indonesia, particularly in the coastal area, there is a growing number of seaweed farmers who work in the informal sector as a home-based industry. It is generally assumed that this sub-group of workers is also experiencing work fatigue.

AIM: This research aims to explore information-related factors that are associated with fatigue among seaweed workers.

METHODS: The study was conducted in Takalar Regency, South Sulawesi, Indonesia. The research used a mixed-method design combining quantitative and qualitative approach. One hundred sixty-one samples were taken from four districts Mangarabombang, Mappakasunggu, Sanrobone, and North Galesong.

RESULTS: More than half of the respondents feel fatigue 67.1%. Furthermore, based on bivariate analysis, it was found that there were significant associations between work hour p = 0.041 and work period p = 0.031 with work fatigue. For the qualitative approach, three focus group discussions were conducted to explore more information related to factors that were found associated with work fatigue from the quantitative study. This research found that a large number of employees experienced work fatigue.

CONCLUSION: The factor that associated with work fatigue is work hour and work period. It is suggested that health providers and stakeholders related need to pay attention to this subgroup of the working population regarding their occupational health and safety problems.

Introduction

Fatigue is one of the most common hazards at workplace and it is directly related to health and safety of the worker. Fatigue is the state of feeling very tired, weary, or sleepy resulting from insufficient sleep, prolonged mental or physical work, or extended periods of stress or anxiety. Boring or repetitive tasks can intensify feelings of fatigue. Fatigue can be described as either acute or chronic [1]. Fatigue can be experienced by formal and informal sector workers. Fatigue is a state in which the body's immune system weakens and decreased workforce. ILOSTAT showed that, in 2017, there were 31% workers that work over 49 h/week and this lead to work-related fatigue [2].

Working over successive days or weeks cause a cumulative fatigue. This cumulative fatigue strongly associated with sleep loss. This fatigue experienced by many workers working over a number of days or weeks. It also states that excessive wakefulness beyond a maximum standard (8 h) caused decreased awareness and poor performance at work while increasing the risk of accidents and injuries [3].

In Indonesia, particularly in coastal area, there is a growing number of seaweed workers who work in the informal sector as a home-based industry. It is generally assumed that this sub-group of workers are also experiencing work fatigue. Furthermore, seaweed workers are required to perform many types of jobs such as cultivation of seeding, planting, maintenance, harvesting, processing, and drying. All type of jobs is physically demanding.

In the second Korean Working Conditions Survey (2010), overall fatigue increased from 17 point 8% in 2006 to 26 point 7% in 2010 [4]. According to the International Labor Organization (ILO) (2013), every year, as many as two million workers die due to work accidents caused by fatigue. In the study, explained from 58,115 samples, 18,828 of them (32.8%) experienced fatigue [5]. The complaint of fatigue is high in the general population in the range of 18.3–27% [6]. The higher prevalence of fatigue has been reported in many operational settings that induce health and safety problems. According to the study results, fatigue is a common reason for employees to consult with a general physician in industrial settings. The prevalence rates of fatigue in industries depending on the instruments used have been reported between 7% and 45% [7].

The first feature of work fatigue is that it involves both extreme tiredness (i.e., lack of energy) and reduced functional capacity. Reduced functional

capacity reflects a decrease in the capacity and/or motivation to respond to certain stimuli or engage in certain types of activities or behaviors [1]. Some factors associated with work related fatigue are duration of work, shift rotation patterns, workloads, timing of tasks and activities, duration of resting, and the workplace environment. Work fatigue was associated with pulse > average, work period > 1 year, and duration of sunlight exposure > average [8]. Thus, this study focuses on factors that associated with work-related fatigue on seaweed worker in Takalar district.

Materials and Methods

The study uses a mixed method design combining quantitative and qualitative approach. All seaweed workers in Takalar Regency become the population of the study. The sample was 161 taken from four districts Mangarabombang, Mappakasunggu, Sanrobone, and North Galesong. Among nine districts in Takalar Regency, those four districts have the highest number of people who work seaweed farmers. A qualitative approach was done by Focus Group Discussion and in-depth interview to stakeholders in four districts.

Questionnaires survey was distributed among 161 workers between August 2018 and March 2019. The workers' fatigue data were obtained using the Work Fatigue Measurement Tool Questionnaire. Furthermore, a Rapid Entire Body Assessment Questionnaire Sheet was used to measure work postures to examine the association between variables, this study performed Chi-square test. This is a qualitative study to understand the surrounding of seaweed worker and was performed with in-depth interview to stakeholder and Focus Group Discussion among seaweed worker.

Results

This part explores information related to the distribution of seaweed farmer's characteristics, distribution of work fatigue, and bivariate analysis of factor related to work fatigue. Table 1 presents demographic data of seaweed workers based on age, gender, work period, and number of working hours per day. As shown in table, almost 70% of workers were at the age group between 20 and 49 years old, while female workers were more than male (60.9% and 39.1%, respectively). Turning to the work period, more than 65% of the workers have been working as seaweed farmers for the above 5 years. Regarding working hours, there were 70 (43.4%) seaweed farmers worked more than 8 h a day.

Table 1: Workers' demographic

Variable	N	%
Age		
10–19	13	8.07
20–29	35	21.7
30–39	38	23.6
40–49	39	24.2
50–59	19	11.8
60–69	13	8.07
≥70	4	2.4
Gender		
Male	63	39.1
Female	98	60.9
Work period (years)		
1–5	46	28.5
6–10	68	42.3
11–15	11	6.8
16–20	26	16.1
21–25	3	1.8
≥26	7	4.3
Working hour		
1–4	38	23.6
5–8	53	32.9
9–12	70	43.4

Table 2 presents the proportion of seaweed worker who experiences work fatigue. More than half of the respondent, 67.1% have experience work fatigue throughout working as seaweed worker.

Table 2: Distribution of respondent based on seaweed worker work fatigue

Work fatigue	Respondent	
	N	%
Fatigue	108	67.1
Not fatigue	53	32.9

Tables 3 and 4 depict from various things related to work fatigue, work hour, and work period are associated with work fatigue. Table 3 depicts seaweed worker that work overtime more than 70% experience work fatigue. More than 60% of seaweed workers that working with proper working hour also experiences work fatigue. With p = 0.041, it stated that work hour is associated with work fatigue.

Table 3: Association of work fatigue and seaweed worker working hour (duration of work)

Work hour (Duration of work)	Work fatigue				Total		p-value
	Fatigue		Not fatigue				
	N	%	n	%	n	%	
Working overtime	53	75.5	17	24.3	70	100	0.041
Proper working hour	55	60.4	36	39.6	91	100	

Table 4 shows that 70% of a long time seaweed worker feel fatigue as a result of the work, whereas recent seaweed worker evenly distributes as half of the seaweed worker feel fatigue and half of them not feel fatigue. Accordingly p = 0.031, it stated that the work period is associated with work fatigue.

Table 4: Association of work fatigue and seaweed worker working period

Work period	Work fatigue				Total		p-value
	Fatigue		Not fatigue				
	N	%	N	%	n	%	
Long time worker	94	70.7	39	32.1	133	100	0.031
Recent worker	14	50.0	14	50.0	28	100	

Discussion

Working condition really affect the work-related fatigue, it also can resulting in acute fatigue syndrome.

More than half of the respondents feel fatigue at 67.1%. At the times of working, the worker bending, sitting, and standing for a long time. Sorting seaweed is done manually and repetitive in bad sitting position/twisting for hours. They do not have set working time, but in growing season, the seaweed worked tend to work overtime.

Related factors to work fatigue are such as age, gender, work shift, rest time, intensity of work, and much more. This study found that there are two factors that related to fatigue among seaweed worker in Takalar South Sulawesi. The factors are work hour and work period means how many years they work.

This study found that working overtime is related to fatigue among seaweed worker. Working overtime means less time to recovery and less time to sleep that can lead to fatigue. A study found for fatigue, the significant predictors became: Female gender, age <50 years, higher socioeconomic group, present illness, hectic work, overtime work, and physically strenuous work [9]. Another study found that working overtime more than 10 h related to work fatigue (acute and chronic) p = 0.001 [10]. Another qualitative study revealed that a long period of working is effecting fatigue [11]. Another study found that fatigue, longer work hours in the same workplace, and working as a nursing technician were associated with decreased workability, emphasizing the need for investment in health and quality of work-life [12].

The growing season for seaweed worker means working overtime. Taking care of the seed, then planting, harvesting then drying seaweed is a very long process. Seaweed worker in Takalar is a home industry, every work shared in family member, so the work time is long since the limited workforce in the family. As a respondent says:

"For planting most of the time I work alone sometime two of us, taking seed then we tie the seed an then planting done in squatting position and when in growing season we do it all day long sometimes until night time, so off course we feel fatigue…"

"Sometimes we took short-time rest because if we not watching the seaweed, it will fail…"

A seaweed worker in Takalar is a home industry and handled by the family. They rarely hire a worker; they just shared by a family member. The work started by sorting the seed, preparing the seed to plant by tie it on a rope, plant it on the sea, taking care until the seaweed growing, and harvesting. The process really long and it makes the working hour is almost done all day long. Individuals who obtained <4 h sleep per night showed increasing lapses in performance and reduced speed and accuracy when completing performance tasks, whereas those who obtained 7 h of sleep or more were able to maintain levels of performance over 14 consecutive days [3].

Another result of this study is a long time worker related to work-related fatigue. Fatigue is strongly associated with time and perhaps become more intertwined as time persists [13]. Long and repetitive work can lead to fatigue as the seaweed worker. Another study stated that the more days people work more fatigued that they feel at the end of the working period because it accumulated [14]. Worker who sleeps less having reduced perform at work [3]. As the respondent says:

"*We plant throughout the year, but the suitable month to plant is January until May. So we feel fatigue as long as we work…"*

"Off course we feel tired, I do this for 20 years. It is physical work, we just do it…"

A study in Lebanon found that fatigue is related to years of working with p = 0.002. In the adjusted analysis, nurses with 5–10 years of working have more fatigue compared with those with <5 years of experience working [15]. Seaweed worker in Takalar mostly carry on the worker from the parents, so they done it for such a young age. It means that they work for years, almost a lifetime occupation. Seeing how they work without a helping tool, it is done manually, so no doubt they experience fatigue. They do not have a day off like office worker, so the fatigue accumulated every day. This accumulated fatigue leads to less productive work as seaweed worker.

Conclusion

The factors associated with work fatigue are work hours and work periods. It is suggested that health providers and stakeholders related need to pay attention to this subgroup of the working population regarding their occupational health and safety problems.

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The Effect of Educational Media Development in Increasing Knowledge and Attitudes on Pregnancy Complications at Sayang Rakyat Hospital in Makassar

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Abstract

BACKGROUND: Each pregnancy and childbirth has complication risks. These complications are accompanying pathological incidences that might cause maternal mortality.

AIM: This research aims to determine the effect of educational media development in increasing knowledge and attitudes about complications of pregnancy and childbirth in pregnant women.

METHODS: This research method passed through several stages as follows: First stage consisted of the development of educational media (leaflets), and second stage consisted of development test with leaflet media using a quasi-experimental research design. The samples were Trimester I to Trimester III pregnant women who visited Sayang Rakyat Hospital Makassar, which consisted of 30 people as intervention group and 30 people as control group. The intervention group was provided leaflets while the control group was provided books on maternal and child health. Data analysis used Wilcoxon Signed Ranks Test and Mann–Whitney test.

RESULTS: The results showed that there are differences in case of knowledge and attitudes of pregnant women regarding complications of pregnancy and childbirth before and after being provided with leaflet intervention with a value of p = 0.000. Likewise, there are differences in the case of knowledge and attitudes of pregnant women regarding pregnancy and childbirth complications between the intervention and control groups with p = 0.041 and 0.001, respectively.

CONCLUSION: Educational media on knowledge and attitudes about complications of pregnancy and childbirth has a positive effect in pregnant women at Sayang Rakyat Hospital in Makassar.

Introduction

Pregnancy occurs due to the meeting of sperm and egg cells. Pregnancy lasts for about 10 lunar months or 9 months calendar or 40 weeks 280 days. Pregnancy length is calculated from the 1st day of last menstrual period [1]. Childbirth is the process of fetus or URI delivery with mature age (37–42 weeks) or those that live outside the uterus through the birth canal or through another way, with or without assistance of cephalic presentation that takes place within 18 h, without complications either on the mother and fetus [2], [3].

Maternal health issues continue as one of the sustainable development goals (SDGs) after the millennium development goals 2015, and the target is to reduce the maternal mortality rate (MMR) [4], [5]. The MMRs due to complications of pregnancy and childbirth in 2017 was around 830 women who died every day. The global maternal mortality ratio is 216/100,000 live births which are still far from the expected target. Globally, the SDGs target of 2030 for maternal mortality is 70/100,000 live births [6]. Based on the data in the medical record of Sayang Rakyat Hospital, there were 85 obstetric complication cases (38%) and 24 (10.16%) prolonged labor cases in 2015, 38 abortion cases (36.02%) and 8 prolonged labor fetal distress cases (6.06%) in 2016, 61 abortion cases (57.00%), and 9 prolonged labor/fetal distress cases (8.41%) in 2017 [7].

Many factors may affect the case of obstetric complications, namely: Lack of knowledge on the danger signs of pregnancy has been proven to be a cause of delay in seeking treatment/help. This is supported by the research of Ogu and Orazulike, 2017 [8], [9], which shows that delay in seeking help is recognized as an important determinant of maternal mortality. It also shows that providing health education is absolutely effective in increasing the knowledge on pregnancy of pregnant women [9], [10], [11]. Health education using leaflets is important for pregnant women to

prevent complications and increase MMR and increase pregnant women's knowledge in dealing with the high risk of pregnancy and childbirth complications [12], [13].

Materials and Methods

This research was a quasi-experimental design with a pretest-posttest control group design that aims to assess the effect of certain treatments on a variable. This research involved two groups: An intervention group provided with leaflets and a control group provided with a book of maternal and child health (MCH). Before the intervention, a measurement of knowledge and attitude (pre-test) was conducted for both the intervention group and the control group. After 2 weeks of intervention, the measurement was conducted to both knowledge and attitudes (post-test) in each group.

This research was conducted at Sayang Rakyat Hospital in Makassar, South Sulawesi. This place was chosen because the case of pregnancy and childbirth complications was still quite high compared to other hospitals in Makassar.

The research population was all 1–3-trimester pregnant women who examined their pregnancies at Sayang Rakyat Hospital on March to May 2020. The research sample was some of the 1–3-trimester pregnant women who examined their pregnancies at Sayang Rakyat Hospital. The data analysis used Wilcoxon Signed Ranks Test and Mann–Whitney test with SPSS software.

Results

The process of educational media development is a modified leaflet from the 2016 MCH handbook of Ministry of Health of the Republic of Indonesia and making of Counseling Event Unit. The MCH handbook is modified into a leaflet with several improvements. In preparing this modified leaflet, the researchers involved several parties at Sayang Rakyat Hospital, including Hospital Health Promotion (PKRS) team, the Midwives in charge of the midwifery department, and several pregnant women.

Bivariate analysis was performed to determine differences in knowledge and attitudes about pregnancy complications before and after being provided with leaflet. The results of the bivariate analysis using the Wilcoxon test are as follows:

In Table 1, with the results of Wilcoxon signed ranks test, the knowledge variable obtained p = 0.000 that was smaller than α = 0.05. It could be concluded that there were differences in maternal knowledge about complications of pregnancy and childbirth before and after being provided with leaflet intervention of MCH handbook modification.

Statistical test results on the attitude obtained p = 0.000, in which smaller than α = 0.05. It could be concluded that there were differences in the attitudes of mothers regarding complications of pregnancy and childbirth before and after being provided with leaflet intervention of MCH handbook modification. Bivariate analysis was performed in the control group to determine differences in knowledge and attitudes about pregnancy complications before and after being provided with MCH handbook. The results of the bivariate analysis using the Wilcoxon test are as follows:

Table 1: Analysis of differences in knowledge and attitudes before and after the leaflet intervention at Sayang Rakyat Hospital in 2020

Variable		Test results	
		Z	p
Knowledge	Pretest-posttest	– 4.547	0.000
Attitude	Pretest-posttest	– 4.714	0.000

In Table 2, with the results of the Wilcoxon signed ranks test, knowledge variable obtained p = 0.000 that was smaller than α = 0.05. It could be concluded that there were differences in maternal knowledge about complications of pregnancy and childbirth before and after the control group who was only provided with the MCH handbook.

Table 2: Analysis of differences in knowledge and attitudes before and after being provided with MCH handbook at Sayang Rakyat Hospital in 2020

Variable		Test results	
		Z	p
Knowledge	Pretest-posttest	– 3.857	0.000
Attitude	Pretest-posttest	– 3.163	0.002

Statistical test results on attitude obtained p = 0.002 that was smaller than α = 0.05. It could be concluded that there were differences in the attitudes of pregnant women regarding complications of pregnancy and childbirth before and after the control group who was only provided with MCH handbook. To determine the differences in knowledge and attitudes between the intervention group and the control group, two analyses were conducted by comparing knowledge and attitudes between the intervention and control groups before (pre-test) and after (post-test) the intervention. The results of the analysis can be seen in Table 3:

Table 3: Analysis of differences in knowledge and attitudes before and after being provided with MCH handbook at Sayang Rakyat Hospital in 2020

Variable	Test results	
	Z	Sig
Knowledge		
Pre-test	– 1.789	0.074
Post-test	– 2.048	0.041
Attitudes		
Pre-test	– 2.399	0.016
Post-test	– 3.451	0.001

Based on Table 3 using the Mann–Whitney test, it showed that the comparison of knowledge between the intervention and control groups before

the intervention obtained p = 0.074. This was >0.05 which meant the intervention and control groups had no difference in knowledge. Whereas after the intervention, the comparison of knowledge between the intervention and control groups obtained p = 0.041. This was smaller than 0.05 which meant the intervention and control groups had differences in knowledge.

The comparison analysis results of attitudes between the intervention and control groups before the intervention obtained p = 0.016. This was smaller than 0.05 which meant the intervention and control groups had differences in attitudes. After the intervention, the results of attitudes comparison between the intervention and control groups obtained p = 0.001. This was smaller than 0.05 which meant the intervention and control groups had differences in attitudes.

Discussion

Leaflet is media of delivering health information through folded sheets. Leaflet is a publication media in the form of paper sheet with a certain size, can be folded (generally, 2–3 folds) or not. The advantages of using this media, including the target, could adjust as well as learned independently and practically because it reduced the need to take notes. The target also could see the contents while relaxed, it was very economical and provided detailed information that was not provided verbally.

The results of knowledge comparative analysis before and after the intervention with the Wilcoxon signed ranks test showed that there were significant differences in both the intervention group and the control group. Although each group had a significant increase in knowledge, the intervention group provided with leaflets had a greater increase in knowledge. For the knowledge comparative analysis between the intervention and control groups using Mann–Whitney test, significant results were was obtained. By considering these two results, it can be concluded that the development of educational media in the form of leaflets had a positive effect in increasing pregnant women knowledge about complications of pregnancy and childbirth.

This research was in line with research conducted by Indrawati *et al*. [14] that there was a difference between the pre-counseling knowledge (leaflet) and post-counseling knowledge (leaflet) about increasing the knowledge of high-risk pregnant women with media-based counseling (p = 0.000). Similar to the research conducted by Fitriani *et al.* [10], it also showed that the average knowledge of pregnant women before and after being provided with health education about high-risk pregnancies in the experimental group showed p = 0.000. It meant that there was a significant difference between the average knowledge of pregnant women before and after being provided with health education about high-risk pregnancies. Health education with leaflets had an effect on the level of pregnant women knowledge regarding healthy lifestyles during pregnancy [15]. In addition, the research conducted by Jannah *et al.* [16] also showed an increase in students' knowledge after being provided with a leaflet about dental caries.

Development of educational media through leaflets modification of the MCH Handbook was done by adding material in the form of high-risk pregnancy, ways to prevent high-risk pregnancies, and avoid high-risk pregnancies. Modified leaflets can help pregnant women to easily understand the complications of pregnancy and childbirth. In addition to the complete material, the targets could also adjust and learn independently and practically because it reduced the need to take notes, they could easily see the content, and various information could be read by target group members to be discussed together. Last, it could provide detailed information which was not provided verbally.

The results of attitude comparative analysis before and after the intervention using Wilcoxon Signed Ranks Test showed that there were significant differences in both intervention and control groups. Although the significant change in the attitude of each group occurred, on the intervention group with leaflets, they had a greater positive attitude than the control group. The results of attitude comparative analysis between the intervention and control groups using the Mann–Whitney test obtained significant results. By considering these two results, it can be concluded that the development of educational media in the form of leaflets had a positive effect on the changes in pregnant women attitudes about complications of pregnancy and childbirth.

This research was in line with the research conducted by Indrawati *et al.* [14] that there was a difference between pre-counseling attitudes (leaflets) and post-counseling attitudes (leaflets) about increasing attitudes of high-risk pregnant women with media-based counseling (p = 0.000). This research was also in line with the research conducted by Jannah *et al.* [16], in which there were differences in attitude before and after health education about dental caries with a p = 0.0001. Moreover, research conducted by Nurhasto *et al.* [17] about adolescents in Klaten showed that there was an effect of counseling about the dangers of free sex on adolescent attitudes. However, this research was actually different from the research conducted by Nurhamsyah *et al.* [18] that there was no effect of education on changes in student attitudes about the adolescent reproductive health triad.

Recommendation

It is expected that the development of educational media both modified leaflets and MCH handbook can be used as a reference and option in

providing health education regarding complications of pregnancy and childbirth to pregnant women in improving knowledge and attitudes at Sayang Rakyat Hospital in Makassar.

Further research is needed regarding the management of pregnancy complications with educational media using application so that they can increase their knowledge and attitudes further about handling the pregnancy and childbirth complications.

Conclusion

Educational media on knowledge and attitudes about complications of pregnancy and childbirth has a positive effect in pregnant women at Sayang Rakyat Hospital in Makassar.

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The Impact of His Frequency and Religiosity toward Prolonged Second Stage and its Impact of the Placenta Separation in Maternity at Siti Fatimah Hospital Makassar

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Abstract

BACKGROUND: The impact of his frequency and religiosity toward the prolonged second stage and its impact of the placenta separation in maternity at Siti Fatimah Mother and Children Hospital of Makassar.

AIM: This research is conducted in which health and normal factors result in the labor process will take place spontaneous.

METHODS: This study used observational analytic research in a cross-sectional study design. A total sample in this study was 60 respondents using the Lemeshow sample size formula and the sampling technique used consecutive sampling. Data analysis used path analysis with SPSS version 22.00.

RESULTS: The results showed that the frequency of his had an impact on the prolonged second stage with p = 0.046, the frequency of his had no direct impact on the placenta separation with a value of p = 0.313, and the frequency of his had the largest indirect effect on the placenta separation through the prolonged second stage of −0.132 or only −13.2%. Religiosity affected prolonged second stage with a p = 0.037. Religiosity did not have a direct impact on the placenta separation with a value of p = 0.991 and religiosity had the largest indirect effect on the placenta separation through prolonged second stage only −0.148 or −14.8%. In addition, the prolonged second stage had a significant impact on the placenta separation with a value of p = 0.000.

CONCLUSION: His frequency and religiosity affect prolonged second stage but do not directly affect the placenta separation in primigravida at Siti Fatimah Mother and Children Hospital of Makassar.

Introduction

Labor is a process of expulsion from the conception (fetus and URI) that has been enough months or can live outside the womb through the birth canal or other means by helping or without helping (own strength). While the labor of the second stage starting from the complete opening (10 cm) until the birth of the baby, the process takes 90 min in primigravida and 30 min in multigravida [1]. Principally, the delivery process is physiological, but there are still many labors that are accompanied by complications. The incidence of complications is still quite high, at 20% of the number of labor, but the number of obstetric cases handled is still below 10% [2], [3].

Maternal mortality is an indicator of the success of health services, especially midwifery services. Obstetric complications are very influenced by maternal mortality rates (MMR), including prolonged parturition (the length of the second stage) [4], [5], [6]. By maternal mortality rate of 34–45% results from bleeding, around 1–3% incidence of post-partum hemorrhage due to placental retention. Placental retention is a cause of obstetric morbidity. It is diagnosed when the placenta fails to separate spontaneously during the third stage of labor when a mother experiences excessive bleeding without placenta separation. This causes post-partum hemorrhage and surgery [7], [8].

The process of labor for the prolonged second stage was very influenced by various factors including passage (birth canal/vaginal labor), power such as his (contraction of the uterine muscles and psychological factors from mother) including the form of husband support and religiosity [9], [10]. While factor of the baby are, passenger (fetus and placenta) and a factor of helper [11]. When prolonged labor of the second stage is not treated quickly, it will cause prolonged fatigue and dehydration so that it will impact on uterine contractions when removing the placenta and eventually cause disruption of placenta separation. The placenta is not separated during 30 min after newborn; there will be retention of the placenta, and eventually, cause post-partum hemorrhage so that it can cause the mother

death. This research is conducted in which health and normal factors result in the labor process will take place spontaneous [12].

Materials and Methods

This study used observational analytic research in a cross-sectional study design. Exogenous variable was the frequency of his and religiosity. The endogenous variables were the Prolonged Second Stage and placental separation. Furthermore, carried out the analysis of impact independent variable (exogenous) and dependent variable (endogenous). This research was conducted at Siti Fatima Mother and Children Hospital of Makassar, South Sulawesi.

The population in this study was all mothers who gave birth or labor at Siti Fatima Mother and Children Hospital of Makassar when the study was running. The total sample in this study was some of the mothers who gave birth at Siti Fatima Mother and Children Hospital of Makassar; they were 60 respondents as a sample. Furthermore, the analysis used was path analysis to establish the exact paths traversed by exogenous variables to affect endogenous variables using path analysis computerized system with SPSS version 22.00.

Results

The results of the bivariate analysis were conducted to find out whether there was an impact between exogenous variables on endogenous. The results of the analysis used path analysis were as follows:

Table 1 showed that there was an impact of his frequency on the prolonged second stage with a value of p = 0.046, it was smaller than α = 0.05, it can be concluded that there was an impact of his frequency on the prolonged second stage and the effect was −0.259.

Table 1: The impact of determinant factors toward prolonged second stage at Siti Fatimah Mother and Children Hospital of Makassar

Exogenous variable	Standardized coefficients beta	t	Sig.
(Constanta)		0.504	0.616
Frequency of His	−0.259	−2.045	0.046
Religiosity (Islamic)	−0.290	−2.139	0.037

Statistical test results on religiosity with a value of p = 0.037 was smaller than α = 0.05, it can be concluded that there was an impact of religiosity prolonged second stage with the value and magnitude of the impact of −0.290. Negative impact indicated that the better the level of religiosity, the less prolonged the second stage.

Table 2 showed that there was an impact of the prolonged second stage on placenta separation with p = 0,000. The positive effect showed that the more time needed for the prolonged second stage, the longer time needed for placenta separation. The result of the statistic test on his frequency with p = 0.313 was larger than α = 0.05, it can be concluded that his frequency did not have a direct influence of the placenta separation.

Table 2: Impact of each exogenous variable direct on placenta separation at Siti Fatimah Mother and Children Hospital of Makassar

Exogenous variable	Standardized coefficients beta	t	Sig
(Constanta)	-	0.411	0.682
Frequency of His	−0.121	−1.019	0.313
Religiosity (Islamic)	0.001	0.011	0.991
Prolonged second stage	0.51	4.166	0.000

The result of the statistic test on religiosity with p = 0.991 was larger than α = 0.05, it can be concluded that religiosity did not have a direct influence on the separation of the placenta.

Table 3 showed that the frequency of his had the largest indirect effect on placental separation (through the prolonged second stage) of −0.132 or −13.2%. Statistic test results on religiosity had the largest indirect effect on the placenta separation through a prolonged second stage of only −0.148 or only −14.8%.

Table 3: The largest impact exogenous variable indirect on placenta separation through prolonged second stage at Siti Fatimah Mother and Children Hospital of Makassar

Exogenous variable	Multiple of Standardized coefficient (beta) and variable of prolonged second stage	large Indirect impact
Frequency of His	−0.259 × 0.51	−0.132
Religiosity (Islamic)	−0.290 × 0.51	−0.148
Prolonged second stage	0.51	

Discussion

The arising of his is an indication of the start of labor, if his arising was weak, short, and the consequences were rare, it will affect the decline of the head and cervical opening which is often called as coordinating uterine muscle contractions, finally it will affect the labor process of the prolonged second stage. It caused fatigue in the mother so that it will affect the contraction of the uterus in the process of the placenta separation [13], [14].

The results of the first hypothesis test were the frequency of his had an impact on the prolonged second stage with p = 0.046, the frequency of his had no direct effect on placenta separation with a value of p = 0.313 and so did the frequency of his had the largest indirect effect on placenta separation through the prolonged second stage of −0.132 or only −13.2%.

The arising of his is an indication of labor start, if his arise was not strong and regular, it would have impacted the process of the head down and the

opening of the cervix would ultimately affect the labor process, especially in the prolonged second stage and finally experienced long parturition [15]. The prolonged second stage will cause fatigue in the mother, so it again influenced uterine contractions when the placenta was separated [16].

Serenity (calmness) in facing childbirth (labor) is needed by every mother. One of the efforts to avoid excessive anxiety is to increase their religiosity. The role of religion is required to overcome the level of anxiety in facing childbirth [17]. Stress in facing childbirth/ labor would have an impact on his contractions so that prolonged labor. Mothers who experienced prolonged fatigue would have an impact on the process of placenta separation in the third stage [18], [19].

The results of the second hypothesis test were religiosity had an effect on the prolonged second stage with p = 0.037. Religiosity did not have a direct effect on the placenta separation with a value of p = 0.991 and religiosity had the largest indirect effect on the placenta separation through prolonged second stage only −0.148 or −14, 8%.

According to researchers that the results of the hypothesis test were proven (significant) because someone who had good religiosity would obtain inner peace so that it did not induce the tension of smooth muscles and blood vessels, its manifestation in patients will experience the prolonged second stage which was relatively safe [20].

The result of the fifth hypothesis test showed that prolonged second stage had an influence on the placenta separation with a value of p = 0,000. The impact of the prolonged second stage on the separation of the placenta was positive; it meant that the longer time needed for the second stage, the longer time needed for placental separation.

According to researchers that the results of the hypothesis test were proven (significant) because labor in the prolonged second stage could cause weak uterine contractions due to the prolonged fatigue so that it can have an impact to the detachment process of the placenta or slowdown in the process of the placenta separation [15]. With the presence of uterine muscle retraction, the placenta was separated to its attachment in the Nitabuch layer. The entire placenta is separated within 15 min, pushed toward the vagina, and will be born spontaneously or with a slight push from above the symphysis. His frequency is getting lower, but can still survive so that the blood vessels were pinched. Separation and removal of the placenta as if squeezed from the uterine fundus into opened cervix [21], [22].

Recommendation

It is expected that top management can make policies related to the determinants of the prolonged second stage of labor and its impact on placenta separation in maternity at Siti Fatimah Mother and Children Hospital.

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Prognostic Factors and Survival Rate of Childhood Acute Lymphoblastic Leukemia in Eastern Indonesia: Kaplan–Meier and Cox Regression Approach

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Abstract

BACKGROUND: Acute lymphoblastic leukemia (ALL) is one of the most common childhood hematological malignancies with an incident each year that tends to increase.

AIM: This study aims to determine the survival rate of childhood ALL in Dr. Wahidin Sudirohusodo General Hospital and the prognostic factors that influence it.

METHODS: A retrospective cohort design was conducted among childhood ALL. The samples were patients ALL diagnosed since January 1, 2014, until 31, 2017, in Dr. Wahidin Sudirohusodo General Hospital. A total of 109 patients were selected by simple random sampling. Data collected through medical records observations. Data were analyzed using Kaplan–Meier and Cox regression analysis.

RESULTS: The cumulative survival rate of childhood ALL was 26%. The prognostic factors associated with survival of childhood ALL were nutritional status (p = 0.028), leukocyte counts (p = 0.000), platelet counts (p = 0.000), and comorbidity (p = 0.000). Based on multivariate analysis with Cox regression, the most influencing prognostic factor on survival of ALL patients was comorbidity (p = 0.000, hazard ratio = 3.699 confidence interval 95% 1.945–7.033). Childhood ALL with comorbidities had a risk of death 3699 times higher than childhood ALL without comorbidities.

CONCLUSION: Nutritional status, leukocyte counts, platelet counts, and comorbidity were prognostic factors that influence survival of childhood ALL. Comorbidity was the most influencing prognostic factor on survival of childhood ALL.

Introduction

Cancer is one of the leading causes of death worldwide, including blood cancer or often called leukemia. Acute leukemia is the most common type of cancer among childhood, accounting for 97% of all leukemia types [1]. Acute lymphoblastic leukemia (ALL) is one of the most common childhood malignancies with an increasing incidence every year. Based on facts 2016–2017 data by leukemia and lymphoma society (LLS), in 2009–2013, ALL accounted for 74.5% of new leukemia cases in childhood younger than 20 years [2].

The most common type of cancer suffered by childhood in Indonesia is leukemia [3]. The prevalence of ALL in South Sulawesi Province based on medical record data of Dr. Wahidin Sudirohusodo General Hospital in Makassar for the last 3 years tends to increase and is a disease with the highest number of cases in child care. In 2015, there are 60 cases, increasing by 2016 to 63 cases, and by 2017, there are 67 cases [4].

The survival rate is a measure of the success of disease treatment. Leukemia prognostic factor becomes the doctor's benchmark in determining the treatment to be given to the patient. A poor prognostic affects the body's resistance to illness. ALL prognostic factors include nutritional status, leukocyte counts, platelet counts, and comorbidity [1], [5].

Nutritional status of patients with ALL at the time of diagnosis has an effect on the outcome of leukemia treatment. Obesity affects childhood, who suffers from ALL. Obese patients with ALL had a significantly worse survival than non-obese patients [6]. In addition, the study in Belanda found that underweight at the time of ALL diagnosis was a risk factor for relapse and decreased body mass index during treatment was associated with reduced survival [7]. The number of leukocytes is a factor frequently identified in ALL patients. Patients with leukocyte count >50,000 μl were associated with a low survival rate [8]. A study in Brazil found that the leukocyte counts of ALL patients had a significant effect on survival rate [9]. Leukemia can decrease platelet production if cancer cells spread

to the bone marrow. Patients with leukemia who have platelets <30,000 μl have a poor prognostic. Platelet counts were a prognostic factor that influenced the survival of childhood with ALL [10]. Leukemia is a disease of abnormal white blood cells that are immune cells of the human body. Disruption white blood cells make the body easy to get the disease, especially infectious diseases. Comorbidity is a poor prognostic factor for leukemia patients [11].

Several studies related to survival and ALL prognostic factors performed in some countries, especially in developed countries, have proved that prognostic factors such as nutritional status, leukocyte counts, platelet counts, and comorbidity are significantly associated with ALL survival in childhood. By examining the survival rate of leukemia patients, it can assist in the development of leukemia information and its prevention in the future. This study aims to determine the survival rates of patients with ALL in childhood in Dr. Wahidin Sudirohusodo General Hospital and the prognostic factors that influence it.

Materials and Methods

This study was conducted at Dr. Wahidin Sudirohusodo General Hospital, Makassar, South Sulawesi, Eastern Indonesia. The type of research used was observational analytic with retrospective cohort design. The population in this study was ALL patients diagnosed since January 1, 2014, until 31, 2017. A total of 109 patients were selected by simple random sampling. Sample criteria in this study were childhood aged 0–18 years when first diagnosed ALL and have a complete medical record and meet the criteria of variables studied.

Data were conducted through ALL patients medical record observations. The instrument used is the observation sheet. From the patient's medical record, data were collected according to the research needs such as gender, address, telephone number, type of financing, date of first visit and date of exit or date of last visit, date of birth, diagnosis age, nutritional status, ALL characteristics, number of leukocytes, platelet counts, comorbidity, and patient status (life or death). In addition to data collection through medical record search, researchers also conducted a search through the telephone communication media to ask the patient's status to the parents or family of patients. If the phone number of the parents or family of the patient cannot be contacted, then the determination of the patient's status is based on the patient's last condition at the last hospital control, as recorded in the patient's medical record. When the patient comes out in good condition, then the patient is categorized as a sensor (survive), whereas if the patient goes out in bad condition, then the patient is categorized as the event (death).

Univariate analysis aims to describe the distribution of patient characteristics and research variables. Bivariate analysis was performed to determine the probability difference of survival of ALL patients based on the prognosis factor using Kaplan–Meier method with the log-rank test. Multivariate analysis was performed to determine the most influencing variable on survival of ALL patients using Cox regression (proportional hazard [PH] model), test performed simultaneously for variables that meet assumptions of proportional hazard.

Results

Table 1 shows the characteristics of the sample in this study. Of 109 LLA patients, most patients died (63.3%) compared to patients who survived. The majority of ALL patients were in the 1–10 year age group (76.1%). Most ALL patients were men (60.6%). Based on ALL risk grouping, according to the National Cancer Institute, more than half of ALL patients (54.1%) are categories high risk. The cumulative proportion of ALL survival in childhood who reached 4 years (48 months) was 26% (Figure 1).

Table 1: Distribution of patient characteristics

Characteristics	n	F
Survival status		
Event	69	63.3
Sensor	40	36.7
Age diagnosis (years)		
<1	3	2.8
1–10	83	76.1
>10	23	21.1
Gender		
Male	66	60.6
Female	43	39.4
Risk grouping ALL		
High risk	59	54.1
Standard risk	50	45.9

ALL: Acute lymphoblastic leukemia.

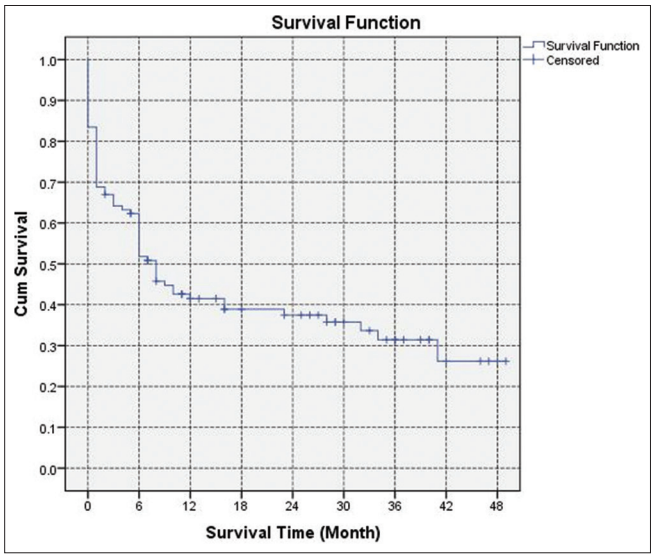

Figure 1: Survival rate childhood acute lymphoblastic leukemia

Most of the ALL patients who died were patients with abnormal nutritional status (71.4%). Based on leukocyte counts and platelet counts, most of the ALL patients who died were patients with leukocyte counts >50,000 μl (82.9%) and platelet counts <30,000 μl (82.1%). Based on comorbidity, the most died patients in patients with comorbidity (85.1%) (Table 2). Differences in the survival of patients with ALL in childhood based on prognostic factors are presented in Figure 2. The survival curve of ALL patients based on nutritional status, leukocyte counts, platelet counts, and comorbidity do not intersect. This shows the assumption PH fulfilled, with p-value (log rank) <0.05. That is, there is a significant relationship between nutritional status, leukocyte counts, platelet counts, and comorbidity with the survival of ALL patients.

Table 2: Distribution of LLA patients based on research variables and survival status

Research variable	Survival status				Total		p (log rank)
	Died		Survive				
	n	F	n	F	n	F	
Nutritional status							0.028*
Abnormal	50	71.4	20	28.6	70	100	
Normal	19	48.7	20	51.3	39	100	
Leukocyte counts (μl)							0.000*
>50,000	29	82.9	6	17.1	35	100	
<50,000	40	54.1	34	45.9	74	100	
Platelet counts (μl)							0.000*
<30,000	46	82.1	10	17.9	56	100	
>30,000	23	43.3	30	56.6	53	100	
Comorbidity							0.000*
Yes	57	85.1	10	14.9	67	100	
No	12	28.6	30	71.4	42	100	

ALL patients survival rate based on nutritional status that is abnormal nutrition was 16%, whereas normal nutrition was 46%. The survival rate based on the leukocyte counts is the leukocyte counts >50,000 μl was 8%, while the leukocyte counts <50,000 μl was 34%. The survival rate based on the platelet counts is the platelet counts <30,000 μl was 13%, whereas the platelet counts >30,000 μl was 41%. The survival rate of ALL patients is based on comorbidity which was 8% and without comorbidity was 70% (Figure 2).

Table 3 shows that variables having $p < 0.05$ were platelet counts and comorbidity. Among the two variables, the comorbidity variable has the highest hazard ratio value of 3.699 confidence interval 95% 1.945–7.033. Thus, comorbidity is the variable that has the most dominant influence on survival of ALL patients. Childhood ALL with comorbidities had a risk of death 3699 times higher than childhood ALL without comorbidities.

Table 3: Results Cox regression analysis multivariate

Variable	B	SE	Wald	Sig.	HR	95% CI for HR	
						Lower	Upper
Nutritional status	−0.96	0.303	0.101	0.750	0.908	0.501	1.645
Leukocyte counts	0.357	0.259	1.907	0.167	1.430	0.861	2.375
Platelet counts	1.107	0.300	13.637	0.000	3.027	3.027	5.448
Comorbidity	1.308	0.328	15.913	0.000	3.699	1.945	7.033

CI: Confidence interval, HR: Hazard ratio, SE: Standard error.

Discussion

This study shows that the 4-year survival rate of childhood ALL in Dr. Wahidin Sudirohusodo General Hospital was 26%. Prognosis factors associated with the survival rate of childhood ALL were nutritional status, leukocyte counts, platelet counts, and comorbidity.

Survival rate in this study was lower than a study in Yogyakarta, where the survival rate of childhood with ALL was 56.1% [12]. In addition, there was a significant difference between ALL survival rates in this study and two studies conducted in Brazil and Germany [13], [14]. Survival rates of both studies are over 75%. This shows the survival rate of ALL patients in developing countries is still very low when compared with developed countries as Brazil and Germany. The difference in survival rates for patients with ALL is likely due to differences in patient conditions such as individual factors, cancer factors, and leukemia management factors in each study site. In addition, follow-up different lengths of also caused a difference in survival rate.

The low proportion of survival of ALL patients in childhood diagnosed in Dr. Wahidin Sudirohusodo Makassar is caused by several factors, as there are many patients who refuse chemotherapy and do not continue treatment because of side effects caused by a combination of cytostatic drugs on chemotherapy treatment. In addition, many patients are returning at their own request under adverse conditions so that many ALL patients die of not continuing treatment.

One of the prognostic factors associated with survival of patients with ALL in childhood in Dr. Wahidin Sudirohusodo General Hospital is nutritional status. Most ALL patients with abnormal nutritional status (71.4%) were died. The proportion of survival of patients with abnormal nutrition is lower than that of ALL patients with normal nutrition. The results of this study are in line with research Eissa, Galilee, and Orgel, who concluded that obesity affects the prognosis of ALL patients in childhood [6], [15], [16]. Obese patients with ALL had a significantly worse survival than non-obese patients. One of the risk factors for leukemia is due to gene mutation. Obesity may speed up the rate of cell mutation or disrupt the cellular mechanism of DNA repair that results in mutation events [17]. Therefore, ALL patients with abnormal nutrition tend to have a poor prognosis. It is important to develop interventions to reduce obesity prevalence by a focus on behavioral therapy [18].

The study also showed a correlation between leukocyte counts and survival of ALL patients in childhood. The most deaths were in patients with leukocyte counts >50,000 μl (82.9%). The proportion of survival of patients with leukocyte counts >50,000 μl was lower than that in ALL patients with leukocyte counts <50,000 μl. The results of this study are in line with research Sousa, Rujkijyanont, Gupta, and Parvareh who found that the number of leukocytes at the time of diagnosis was related to the probability of survival of childhood with ALL [9], [19], [20], [21]. The leukocyte

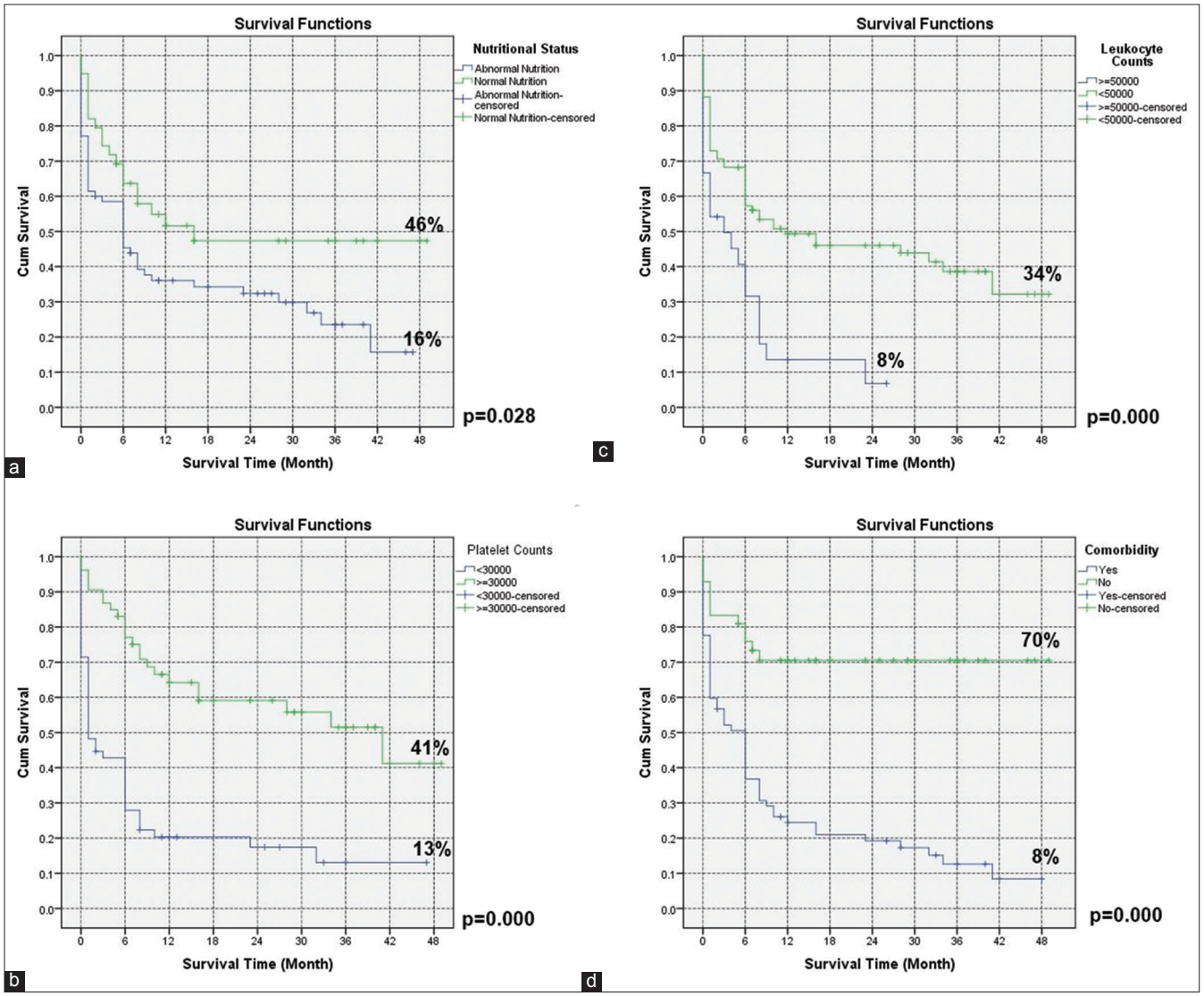

Figure 2: (a-d) Survival rate childhood acute lymphoblastic leukemia according to nutritional status, leukocyte count, platelet count, and comorbidity with Kaplan–Meier method

counts above 100 × 109/L is a prognostic factor of induction phase failure in chemotherapy treatment [22].

Leukemia can decrease platelet production if cancer cells spread to the bone marrow. This study found an association between platelet counts and survival of ALL patients in childhood. Most patients with platelet counts <30,000 μl (82.1%) were died. The proportion of survival in patients with platelet counts <30,000 μl lower than the ALL patients with platelet counts >30,000 μl. Patients with platelet counts <30,000 μl may experience bleeding even if under no activity conditions. This may worsen the condition of the ALL patient. The results of this study were not different from those of Almasi-Hashiani in Iran and Kulkarni in India, which found that platelet counts were a prognostic factor that influenced the survival of childhood with ALL [10], [23]. The results of this study are also in line with the theory that patients with ALL who have platelet counts <30,000/mm³ have a poor prognosis [5].

The comorbidities in this study were comorbidities other than ALL diagnoses that occurred when patients underwent treatment that could affect the patient's condition. The results of this study indicate an association between comorbidity and survival of ALL patients. The most deaths were in patients with comorbidity (85.1%). The presence of comorbidity is a poor prognostic factor for leukemia patients. The most common comorbidities in this study were thrombocytopenia (48.6%), then anemia (47.7%), neutropenia (31.2%), hyperleukocytosis (21.1%), underweight (20.2%), sepsis (17.4%), and caries dentist (13.8%). Most ALL patients have comorbidities of more than one disease. The results of this study are in line with Simanjorang's research, which concluded that patients with comorbidity had 5% survival probability of 0% [11]. That is, patients who have comorbidities have died before 5 years. Disruption of white blood cells causes the body easy to get the disease. In addition, leukemia patients become susceptible to other diseases due to interventions such as chemotherapy, stem cell transplantation, and radiation that can cause deficiency of the body. The therapy also results in skin and mucosal growth

disorders in the digestive tract making it susceptible to bacterial infections [24].

Conclusion

Survival rate of childhood ALL in Dr. Wahidin Sudirohusodo General Hospital Makassar was 26%. The prognostic factors significantly associated with ALL survival were nutritional status, leukocyte counts, platelet counts, and comorbidity. The most influential prognostic factor for ALL survival is comorbidity. Stratification of leukemia treatment based on prognostic factors associated with ALL patient survival needs to be done to improve treatment success.

Recommendation

Research needs to be done on the evaluation of cytostatic side effects on the treatment of leukemia (chemotherapy) to prevent the occurrence of comorbidities in ALL patients that may affect the outcome of patient treatment.

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Effect of Chocolate Soybean Drink on Nutritional Status, Gamma Interferon, Vitamin D, and Calcium in Newly Lung Tuberculosis Patients

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Abstract

BACKGROUND: Tuberculosis (TB) is an infectious disease associated with malnutrition and high risk to morbidity and mortality, especially when it was not supplied with a balanced diet. This study aimed to assess the effect of chocolate soybean drink (CSD) on nutritional status, gamma interferon (IFN-γ), Vitamin D, and calcium level in newly diagnosed pulmonary TB patients.

AIM: This study aimed to assess the effect of chocolate soybean milk to nutritional status, interferon-gamma level, Vitamin D level, and sputum conversion in lung TB patients.

METHODS: Quasi-experimental design pre- and post-test control was performed on 34 patients who were divided into two groups, each consisting of 17 people. The intervention group received 100 grams CSD per day and nutritional education, while the control group was only given nutritional education for 30 days. A 24-h food recall was performed to record any nutritional intake in the past 24 h. The nutritional status was determined by anthropometric measurements. Laboratory examination was performed to analyze the IFN-γ level, Vitamin D, and calcium level.

RESULTS: Study showed a significant increasing in body weight (p = 0.000), BMI (p = 0.000), IFN-γ levels (p = 0.001), and not significant on MUAC (p = 0.716). Vitamin D was increased in the intervention group and decreased in the control group. Calcium intake was higher in the intervention compared to the control group (456.6 vs. 151.3) and significantly different (p = 0.000), while sputum BTA conversion was found higher in the intervention group than in the control group and not significantly different between groups (47.1% vs. 17.6%).

CONCLUSION: It was concluded that CSD could increase nutritional status (BMI), IFN-γ, Vitamin D, and calcium level in patients with pulmonary TB.

Introduction

It is estimated that 10 million people in the world were found to be infected by tuberculosis (TB). In 2017, TB infection was found in 5.6 million on men, 3.2 million on women, and 1 million children. Nine percent of TB patients were found to have HIV infection (in which 72% found in Africa) and 2/3 of it was found in India (27%), China (9%), and Indonesia (8%) [1]. The prevalence of TB in Indonesia (2014) was 297 over 100,000 population. In 2017, it was estimated 10 million of TB incident were found (133 cases over 100,000 population). The WHO Southeast Asia and Africa recorded for almost 70% of all TB cases in the world.

Data taken from Ditjen P2P, Ministry of Health – Republic of Indonesia in January 31, 2019, showed that Indonesia had 511,873 TB patients. The number of confirmed new cases of TB with positive bacteriology in 2018 was 203,348 patients. East Java had the highest number of TB patients. South Sulawesi had 23,427 patients.

One of the characteristics of facultative intracellular bacteria, *Mycobacterium tuberculosis*, is the ability of being survived and multiplying within phagocyte cells and being able to hide from host's circulating antibody. Hence, eliminating this kind of bacteria requires effective cell-mediated immunity [2].

Inhaling a TB pathogen can stimulate a cell-mediated immune response that initiates an inflammation process. The increase of pro-inflammatory cytokines such as IL-6, TNF α, IL-1β, and IFN–γ can make a metabolic change in TB patients. This process is called an anabolic block, where there is inhibition of protein formation and fat synthesis and an increase of proteolysis and lipolysis to produce free fatty acids (FFA) as an energy source for bacteria and increase virulence. Eventually, malnutrition is a common finding in TB patients [3].

IFN-γ increases phagocytosis function of a *M. tuberculosis* infected macrophage by stimulating

phagolysosome formation. IFN-γ stimulates the formation of free radical to destruct DNA and cell wall of *M. tuberculosis*. IFN-γ in TB patients is found to be significantly lower than the healthy population [4]. Nutritional intervention that can increase IFN-γ as one of body's defense against lung TB infection is an important action. A quasi-experiment controlled design study conducted by Nurpudji [5] on TB patient in BBKPM Makassar, found that nutritional education and a high protein as a supplementary feeding (soy protein) could improve the nutritional status of TB patients.

Isoflavone genistein is an active substance that plays an important role in this case. Isoflavone in soybean significantly suppressing expression of a mature dendritic cell within the immune system in Type I MHC but not Type II MHC in *in vitro* study. Isoflavone inhibits lipopolysaccharide in dendritic cells to induce IFN-y in CD4+ T cell. Degranulation of a natural killer cell (NK cell) and apoptosis of dendritic cells is found to be significantly higher in isoflavone administration in dendritic and NK cells study [4].

In an *in vivo* study, as well as soybean, cocoa has a high protein and fat content. Cocoa bean or chocolate can increase serotonin neurotransmitter release, hence, will increase appetite. It also contains a high flavonoid, an antioxidant that can increase the function of immune system [6]. Administration of both soybean and cocoa can increase calorie and protein intake in lung TB patients. Type of protein given is a protein that can increase immune system function and appetite, hence, can increase their nutritional status.

The importance of this study is considering a fulfillment of calorie, protein composition, and flavonoid, along with an increase of appetite and antioxidant administration from chocolate soybean drink (CSD). This study aimed to assess the effect of chocolate soybean milk to nutritional status, interferon-gamma level, Vitamin D level, and sputum conversion in lung TB patients.

Materials and Methods

This study uses a quasi-experimental study design using pre- and post-test in two groups. Purposive sampling, a non-probability sampling method, was used. The population in this study is lung TB patients in the lung medical center in Makassar (BBKPM) and Wahidin Sudirohusodo Hospital, Makassar. Diagnosis of TB was done by acid-fast bacilli (AFB) sputum examination, erythrocyte sedimentation rate, and thorax photo. Sample in this study is a newly diagnosed lung TB patient with positive AFB sputum, normal urinalysis and had no history of antituberculosis treatment.

Data collection was done in 2 phases. Phase 1, we performed a screening to determine sample followed by assessing samples that fulfilling our criteria. After samples had been decided, we divided samples into two groups: Intervention group and control group. In phase, we collected data from all variables in this study. In intervention groups, we gave 100 grams of CSD and nutritional education, whereas in the control group, we only gave nutritional education. Before intervention, we did a pre-test assessment for nutritional status, food intake measurement, interferon-gamma, Vitamin D and calcium examination, and AFB sputum examination. After 4 weeks of observation, we did a post-test assessment for nutritional status food intake measurement, interferon-gamma, Vitamin D and calcium examination, and AFB sputum examination.

Statistical analysis was done using SPSS after underwent a normality test. An independent t-test was used to compare anthropometric, food intake, and laboratory data form both groups. For abnormal distribution, we used the Mann–Whitney test. $p < 0.05$ used to determine significance. Ethical clearance was given by the ethical committee of Universitas Hasanuddin for Biomedical Research in human.

Results

Table 1 showed that most of the samples were male in both groups (47% in the intervention group and 94.1% in the control group) and below 50 years old (94.1% in the intervention group and 82.3% in the control group). In ethic group classification, Makassar was dominating in both groups (67.4%). In occupation classification, unemployed group was dominating (64.6% in the intervention group and 52.8% in the control group). According to the educational level,

Table 1: Distribusi Karakteristik Sosial Demografi Kedua Kelompok Subjek Penelitian (Kelompok Intervensi dan Kelompok Kontrol)

Variable	Intervensi	%	Kontrol	%	Total	%
	n=17		n=17		n=34	
Jenis kelamin						
Laki-laki	8	47.0	16	94.1	24	70.6
Perempuan	9	53.0	1	5.9	10	29.4
Umur						
≤ 50 tahun	16	94.1	14	82.3	30	88.2
>50 tahun	1	5.9	3	17.7	4	11.8
Suku						
Makassar	13	76.4	10	58.8	23	67.4
Bugis	2	11.8	5	29.4	7	20.6
Toraja	2	11.8	-	0.0	2	5.9
Flores	-	0.0	1	5.9	1	3.05
Manado	-	0.0	1	5.9	1	3.05
Pekerjaan						
Pegawai	1	5.9	1	5.9	2	5.8
Pensiunan	-	0.0	1	5.9	1	3.05
Wiraswasta/PKL	4	23.5	3	17.6	7	20.5
Karyawan swasta	1	5.9	-	0.0	1	3.05
Buruh/Tukang becak/tidak bekerja	11	64.6	10	58.8	21	61.7
IRT	2	11.8	-	0.0	2	5.8
Nelayan	-	0.0	1	5.9	1	3.05
Pendidikan						
Tidak sekolah	-	0.0	1	5.9	1	3.05
SD	3	17.7	3	17.7	6	17.6
SMP	8	47.0	3	17.7	11	32.3
SMA	5	29.4	7	41.0	12	35.2
PT	1	5.9	3	17.7	4	11.8

high school graduated group was the highest (35.2%) followed by junior high school graduated (32.3%).

Table 2 showed results of statistical analysis for mean distribution of age, anthropometry study (body height, body weight, body mass index, and mid-arm circumference), and laboratory results including IFN-y, white blood cell count, lymphocyte count, lymphocyte percentage, granulocyte count, granulocyte percentage, and hemoglobin (Hb). These data showed no statistical difference between groups (p > 0.05).

Table 2: Analisis Perbandingan Pengukuran Antropometri berdasarkan Kelompok sebelum dan Setelah Intervensi

Variable	Pre-test	Post-test	p value	A	p value
BB (kg)					
Intervensi	44.11 ± 4.88	45.50 ± 4.77	0.000#	11.38 ± 0.51	0.000*
Kontrol	44.98 ± 4.48	45.48 ± 4.34	0.000#	0.49 ± 0.45	
Lila (cm)					
Intervensi	22.17 ± 2.68	22.63 ± 2.73	0.000#	0.46 ± 0.18	0.716*
Kontrol	22.06 ± 1.54	22.64 ± 2.03	0.085#	0.58 ± 1.30	
IMT					
Intervensi	17.24 ± 0.91	17.79 ± 0.87	0.000#	0.54 ± 0.22	0.000*
Kontrol	17.64 ± 1.20	17.84 ± 1.21	0.001#	0.20 ± 0.20	

Table 3 showed mean energy intake before intervention, which was 1308 kcal in the intervention group and 1238 kcal in the control group. Protein intake was 42.72 g in the intervention group and 42.7 g in the control group. Statistical analysis showed equality in energy, carbohydrate, protein, and fat intake before intervention in both groups.

Table 3: Analisis Perbandingan Rerata Asupan Energi, Zat Gizi Makro, Kalsium dan Vitamin D Kedua Kelompok Subjek Penelitian (Kelompok Intervensi dan Kelompok Kontrol) Sebelum dan Setelah Intervensi

Variable	Pre-test	Post-test	p value*	Δ	p value**
Energi (kkal)					
Intervensi	1.308.0	2.119.50	0.000	↑811.34 ± 175.33	0.538
Kontrol	1.238.0	2.014.62	0.000	↑776.86 ± 146.04	
Protein (gr)					
Intervensi	42.72	97.20	0.000	↑54.55 ± 12.41	0.000
Kontrol	42.70	68.72	0.000	↑25.93 ± 15.02	
Lemak (gr)					
Intervensi	24.0	56.20	0.000	↑31.96 ± 16.61	0.126
Kontrol	20.80	45.37	0.000	↑24.56 ± 10.01	
KH (gr)					
Intervensi	224.02	280.20	0.000	↑56.26 ± 49.13	0.001
Kontrol	216.60	328.50	0.000	↑111.83 ± 33.26	
Ca (mg)					
Intervensi	239.5	696.16	0.000	↑456.61 ± 208.33	0.000
Kontrol	137.5	288.85	0.000	↑151.29 ± 69.13	
Vitamin D (ngml)					
Intervensi	7.46	9.85	0.236	↑2.39 ± 4.01	0.247
Kontrol	6.50	8.77	0.197	↑2.27 ± 8.49	

Table 4 showed an increase in body weight, mid-upper arm circumference, and body mass index after intervention. Comparative analysis before and after intervention was done in both groups. Statistical test showed a significant difference in body weight (p = 0.000) and body mass index (p = 0.000) but not significant in mid-upper arm circumference (p = 0.716).

Table 4: Analisis Hasil Pemeriksaan Laboratorium Kalsium, Vitamin D, IFN-γ berdasarkan Kelompok Sebelum dan Setelah Intervensi

Variable	Pre-test	Post-test	p value	Δ	p value
Ca (mg)					
Intervensi	9.41 ± 0.45	9.43 ± 0.94	0.210	↑0.02 ± 1.16	0.169
Kontrol	9.24 ± 0.52	8.92 ± 1.67	0.571	↓0.24 ± 3.21	
25(OH) D3(ng/mL)					
Intervensi	21.176 ± 8.28	21.35 ± 6.15	0.666	↑0.17 ± 9.7	0.133
Kontrol	24.882 ± 11.36	22.841 ± 9.70	0.652	↓−2.05 ± 4.82	
IFN-γ (pg/ml)					
Intervensi	16.34 ± 10.29	44.61 ± 25.56	0.000	28.27 ± 1.79	0.001**
Kontrol	12.28 ± 5.01	21.62 ± 8.83			

Table 5 showed a comparative analysis between changes on IFN-y, WBC, lymphocyte count, lymphocyte percentage, granulocyte count, granulocyte percentage, and Hb level. Changes on IFN-y and Hb level were found to be significant (p = 0.001 and 0.036, respectively).

Table 5: Hasil pemeriksaan sputum BTA sebelum dan setelah intervensi

Sputum BTA	KelompokIntervensi (n=17)				KelompokKontrol (n=17)			
	Pre-test		Post-test		Pre-test		Post-test	
	n	%	n	%	n	%	n	%
Positif (+)	17	100	9	52.9	17	100	14	82.4
Negatif (-)	0	0	8	47.1	0	0	3	17.6
Total	17	100	17	100	17	100	17	100

Discussion

This study showed the effect of CSD to nutritional status and IFN-y level in two groups (intervention group and control group). We performed a non-randomized controlled clinical trial comparing intervention group (100 g/day of CSD along with nutritional education) to the control group (only nutritional education) in lung TB patients.

Nutritional intake assessed using 24 h food record during intervention in food history form. However, this method required commitment from subjects to take a note for every food they ate, both its type and amount. This strategy was aimed to decrease the tendency of subjects who were possible to forget what they ate. Hence, this type of bias could possibly be decreased. Moreover, ensuring the homogeneity perceptions in food intake using food models and analyzed using Nutrisurvey Indonesia.

Administration of fusion between soybean and cocoa in the form of a daily 100-g liquid had high energy (523 kcal) and protein (40.71 g). This soybean chocolate drink was given in 30 days showed a positive effect in increasing calorie and protein intake in lung TB patient. The type of protein given was a protein that can increase the immune system and appetite; hence, it can increase their nutritional status.

Our study showed a fulfillment of calorie, protein composition, and flavonoid intake in the intervention group. Moreover, we also found an increase of appetite and fulfillment of antioxidant in the soybean chocolate drink administration. Therefore, a significant improvement on body mass index (BMI) and increased IFN-y in the intervention group compared to the control group. The increase of BMI indicates an increase in body weight.

The increase of energy and protein intake was higher in the intervention group. This might be

due to a high protein supplementary food given in the intervention group. This supplementary feeding increased energy and protein intake in which was necessary in malnutrition patient. We also found a similar increase in the control group that was due to increased appetite after treatment and changes in food intake (amount and type) after nutritional education. Information about recommended for lung TB was given during nutritional education; thus, participants changed their food (type and amount) accordingly. The quality and quantity of protein recommended were given, for example, fresh fish, egg, milk, green beans, tofu, soybean cake, chicken, and beef.

Our study showed a higher increase in body weight in the intervention group (1.38 kg) compared to the control group (0.49 kg). Karyadi [7] found a higher increase in body weight in their intervention group compared to their control group. This increase within 2 months in the interventional and control group were 2.20 ± 0.35 kg and 2.19 ± 0.35 kg, respectively. Within 6 months, body weight increase in the intervention group and the control group were 4.74 ± 0.42 kg and 4.96 ± 0.48 kg, respectively. Body weight increase was associated with an increase of energy intake and physiological need fulfillment. In the first phase, energy and protein intake are used for physiologic needs followed by consumption for physical activities and fulfillment of macronutrient reservoir (carbohydrate, protein, and fat). This reservoir fulfillment can be seen in body weight increase and other anthropometric measurements.

Analysis on mid-upper arm circumference (MUAC) measurement showed an insignificant increase in both groups. Moreover, both data had not reached normal MUAC value (> 23.5 cm). MUAC increase in the intervention group was found to be higher (22.17 ± 2.68 cm before intervention to 22.63 ± 2.73 cm after intervention) than control group (22.06±1.54 cm before intervention to be 22.64 ± 2.03 cm after intervention). MUAC is an indicator for assessing protein reservoir in muscle in which is usually low in malnourished people. Despite a statistically insignificant difference, the increase of MUAC indicates an increase of endogenous protein storage in which is associated with protein intake. Compared to study by Karyadi [7] in the second month, MUAC in the intervention group was 22.8 ± 0.3 cm before intervention and 23.4 ± 0.4 cm after intervention, where they found 21.8 ± 0.6 cm before intervention and 22.8 ± 0.6 cm after intervention in the control group.

Body mass index in this study was increased in both groups, although still below the normal range (> 18.5–23). This might be due to limitations in the duration of the study which was only 1 month. We predict had the study been done for 6 months, it would have been possible to reach a normal range of BMI. This finding was similar to the study by Karyadi [7] in which BMI reached normal value after 6 months. The increase of BMI in adult is due to an increase of body weight. In an interventional study, BMI increase was higher than the control study.

Malnutrition is associated with a decrease of immune system. According to Chandra [8], nutritional status is associated with susceptibility to infectious diseases such as TB. Nutritional deficiency makes decrease and dysfunction of immune response, phagocyte function, cytokine production, and complement system. Increase of IFN-y was found in both groups ($p = 0.001$) which were higher in the intervention group. Chandra [8] also found that adequate nutritional intake, especially protein, could activate the cellular immune system, whereas IFN-y was the part of it. IFN-y is an important immunoregulator that has multiple effects in maturation and function of immune system to fight against TB [9].

According to Kaur [10] oxidative stress and reduced antioxidant were found in lung TB patients. Appropriate antioxidant supplement is needed for lung TB patients for protection against free radical [11]. Twenty-two milligram of flavonoid contained within a 100 g of CSD. In most Asian countries, isoflavone (flavonoid) consumption assumed to be 25–45 mg/day. Antioxidant feature in isoflavone makes an improvement in the immune system [12].

The availability of nutrients derived from food is associated with body defense against free radicals. Isoflavone contained in soybean is one of the natural antioxidant (Retno *et al*., 2012). Many studies showed that isoflavone as a phenol derived antioxidant can be found in soybean and other legumes. It has a positive effect on inflammation and improves immune function both *in vitro* and *in vivo* [13]. Our study showed that the administration of a 100-g CSD contained 440 mg calcium. Consumption for 30 days had a benefit to increase calcium intake in lung TB patients.

Calcium intake was found to be higher in the intervention group. CSD consumption could increase calcium intake in lung TB patients in which often had low intake in calcium. The increase of calcium intake was also found in the control group due to appetite improvement after consuming antituberculosis treatment and food amount and variation after nutritional education. Food recommendation was informed in our nutritional education in both groups, including the food amount and variations.

According to Baig [14], calcium and Vitamin D had an antimicrobial feature against TB by enhancing macrophage and monocyte function by increasing nitric oxide (NO) production. Intake of Vitamin D in both groups increased insignificantly. The highest increase occurred in the intervention group. Analysis of the differences between the two groups also showed insignificant values. If these results are compared with the 2013 recommended daily allowance (Angka Kecukupan Gizi or AKG), vitamin D intake at the age of 3–64 years is

15 mcg. Acid-fast bacilli (AFB) sputum conversion from positive to negative was higher in the intervention group (47.1%) compared to the control group (17.6%). Thus, a daily CSD for 4 weeks can accelerate the conversion of sputum in the intervention group.

Recommendation

We suggest that further research is needed for evaluating the effect of CSDs with a longer intervention time to evaluate a better nutritional status in lung TB patients. Moreover, further research is needed to measure the levels of serum antioxidants in both groups.

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The Effect of the Implementation of Makassar Healthy City Based on Capacity Building and Sustainability

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Abstract

BACKGROUND: This research analyzed the effect of the implementation of healthy city in Makassar City based on the aspects of capacity building and program sustainability.

AIM: This research aimed to analyze the implementation of healthy city in Makassar City based on capacity building and program sustainability aspects.

METHODS: The research was conducted qualitatively in which the data were collected through direct interview, observation, and field note. Thirteen people were involved as informants consisting of vice mayor of Makassar, two organizers of the healthy city of Makassar City, one member from the forum of the healthy center of Makassar City, and nine community members from nine sub-districts including Makassar, Mamajang, Mariso, Panakkukang, Rappocini, Tallo, Regional Development Planning Agency (Bappeda) of Makassar City, and Indonesian Public Health Bachelor Association (PERSAKMI).

RESULTS: The training and socialization are often ineffective since it is only participated by the coordinators from the healthy city itself. The sustainability of the healthy city program of Makassar City has been implemented well. It was proven by various healthy city appreciation obtained since the implementation of the program. Active involvement and participation from the government, community, agency, and all related stakeholders, as well as strong commitment and desire in the program implementation are the main factor of the sustainability of healthy city program in Makassar City. The suggestion given by this research is to improve the quality of healthy city program but is not based on the consideration of the appreciation.

CONCLUSION: The improvement of the capacity needs to even all forum members of healthy city of Makassar at the level of city, sub-district, and sub-village.

Introduction

The healthy city program in Indonesia has been implemented well and effectively since the issuance of the Regulation of Ministry of Home Affairs and Ministry of Health of the Republic of Indonesia of 2005 [1], [2], [3], [4], [5], even though the healthy district/city has been implemented earlier before in several districts/cities through difference concept [6]. Healthy city program has a global purpose which is to create a better physical, social, and health environment quality [7], [8], [9], [10], [11]. There are four aspects in Indonesia that are willing to be achieved regarding the implementation of healthy district/city program; those are clean, safe, comfortable, and healthy district/city [6], [1].

Makassar healthy city has obtained [5] achievements of Swasti Shaba Wistara since the implementation of a healthy district/city. This is the highest district/city appreciation given to the community and regional government, which has met the requirement and criteria determined by the central government. Swasti Shaba Wistara is an appreciation given to healthy district/city at the level of development with the criteria of first, each district/city chooses orders based on the local resource potential, second, each district/city covers 70% of the sub-district, third, each order implements 70% of all activities including the community institution, fourth, each order is integrated with physical, social/cultural, economy, and health aspects, and fifth, each activity chooses several program indicators (physic, socioeconomy, and culture), the indicator of the public movement from indicator provided [12], [1].

Those five orders can be chosen based on the agreement of healthy city forum with the city government. The five orders include [12]:

a. Settlement, facility, and infrastructure area
b. Orderly traffic and transportation service facilities area
c. Healthy mining area
d. Healthy forest area
e. Healthy industrial and office complex area
f. Healthy tourism area
g. Food and nutrition security

h. Healthy and independent community life
i. Healthy social life.

It is expected that the implementation of healthy city can give effect. The evaluation of the effects encourages the changes of policy evaluation focus from the past to the future and promotes the use of evaluation for policy learning compared to only for control fee. World Bank (2008) in Morton [13] defines that an impact evaluation assesses changes in the well-being of individuals, households, communities, or firms that can be attributed to a particular project, program, or policy. The central impact evaluation question is what would have happened to those receiving the intervention if they had not in fact received the program. Such an effect evaluation was used by the policymaker and developer [14], [15], [16].

The evaluation of the effect of a healthy city had been done by the WHO to five cities in five different countries in the world in 1995–1999. This evaluation was performed to know the implementation result of healthy city regarding the degree of involvement, municipal change, linkages, capacity building, and sustainability [17]. This research refers to this concept because the principles of the implementation of a healthy city are participation, cross-sector cooperation, capacity building, and sustainability which are used in both developing and developed countries [5]. This research aimed to analyze the implementation of healthy city in Makassar City based on the capacity building and program sustainability aspects.

Materials and Methods

This research was done quantitatively in which the data were collected through direct in-depth interview, observation, and field note. The focus was to obtain information regarding the effect of the implementation of healthy city in Makassar City based on capacity building and program sustainability. The research was performed in Makassar City as one of the several cities which have been implemented the healthy city program. The research was done on March 22–May 1, 2019.

This research involved 13 informants chosen based on certain criteria determined upon the research objective. The criteria were all parties having a role in the implementation of healthy city so that they can give accurate information about the implementation of healthy city: Vice Mayor of Makassar City, two organizers of the healthy city program of Makassar City who are the head of Regional Development Planning Agency (Bappeda) of Makassar City and the Head of Public Health Agency of Makassar City, the organizer of healthy city forum of Makassar City and the organizer of the communication forum of the healthy city represented by nine head of sub-districts (Makassar, Mamajang, Mariso, Tallo, Tamalate, Tamlanrea, Panakkuang, Rappocini, and Wajo Sub-Districts).

The data collected in this research were primary and secondary data. The primary data were obtained through in-depth interview, while the secondary data were obtained from document review at research location, which is the public health office of Makassar City, Regional Development Planning Agency (Bappeda) of Makassar City, and the City Forum of Makassar healthy city involved in the implementation of healthy city in Makassar. The data obtained were analyzed using thematic analysis. The analysis was done right after collecting them to avoid misinterpretation, forgetting the meaning or code in the field note, and forgetting the concept in the context of the situation.

Results and Discussion

Informants' characteristics

This research involved 13 informants consisting of the vice mayor of Makassar City, two members of the coach team of healthy city of Makassar City, a member of city forum f Makassar City, and the community from nine sub-districts including Makassar, Mamajang, Mariso, Tallo, Tamalate, Tamlanrea, Panakkuang, Rappocini, and Wajo Sub-Districts (Table 1).

Table 1: Informants' characteristics based on gender

Informants' Code	Gender		Occupation
	Male	Female	
SR	√		Vice Mayor
AA	√		Head of Social Division of Bappeda of Makassar City
SK		√	Head of Environmental Health Division of the Public Health Agency of Makassar City
NB	√		Head of Healthy City Forum of Makassar City
RW		√	Head of Healthy Sub-District Forum of Makassar Sub-District
IK		√	Head of PMK Section of Mamajang Sub-District
AN		√	Head of PMK Section of Mariso Sub-District
AH		√	Head of PMK Section of Panakkukang Sub-District
HW		√	Head of PMK Section of Rappocini Sub-District
AP	√		Secretary of Tallo Sub-District
AM		√	Head of PMK Section of Tamlanrea Sub-District
DR		√	Secretary of Health District Forum of Tamalate Sub-District
AI		√	Head of PMK Section of Wajo Sub-District

Capacity building

In-depth interview was done with all informants by asking questions regarding the educational or training activities concerning the healthy city program in Makassar City, obtaining the following information:

"Yes, there was. The training activities were usually held by the members of Family Welfare Movement (PKK) in Mariso Sub-District. There was also training which was held by the public health office of the city ad province to access the healthy city program." (AN, Mariso Sub-District, April 2019).

"Yes, there was. It was usually in the form of socialization about health, BULO, and Healthy Hallway. There was also training about 3R of waste management. Furthermore, mothers' gathering was also held at the level of sub-village to sub-district in every month. There was also gymnastics at the level of sub-district at the level of sub-village to sub-district in every third week, money aid giving for an orphanage in every Friday of the third week. Finally, there was also innovation named cleans with, where there was supervision unit officer if there was someone who throws waste to the environment of Panakkukang Sub-District and it will be fined for 50 million." (AH, Panakkukang Sub-District, April 2019).

"There was from the Municipal Public Health Office, Bappeda and Persakmi. Socialization was held about nutritional counseling, eye examination training in Kodingareng Island, health promotional officer training, and healthy city training conducted by Persakmi." (SK, Public Health Office of Makassar, April 2019).

Informants said that training and socialization regarding the healthy city in Makassar City were often held and participated by the community and various related offices. The training was usually conducted by the Public Health Office, Bappeda and Persakmi of Makassar City. This is supported by the opinion given by the head of socialization and culture division of Bappeda of Makassar City and the head of healthy city forum of Makassar City as followed:

"It was often held. The first one is about how we fill the form regarding the indicator of the healthy city report. It was taught by the public health office in the form of workshops or trainings. One of the others was healthy city training held by Persakmi, which is also a cooperation with people from the public health office." (AA, Bappeda of Makassar, April 2019).

"There were so many trainings held regarding the healthy city in Makassar. I also often became the speaker in those activities. There were healthy cities training and verification system of healthy district held by Persakmi in February 2019, there was also national healthy city training in September 2018, and if I am not mistaken, the newest one was the healthy city training in Lombok." (NB, Head of KKS Forum Makassar, April 2019).

Based on all information obtained from the informants interviewed, it was known that various training and socialization regarding the healthy city program in Makassar have been conducted. The activities that often held were healthy city training by Persakmi then waste management training, nutrition counseling, and others.

Milen defined the improvement of capacity as a process where individual, group, organization, institution, and community improve their ability to (a) perform the implementation of main duty and core functions, solve problem, formulate, and achieve the target established, and (b) understand and meet the needs of development in a wider context of sustainability [18]. Capacity building refers to the process where individual, group, institution, and community develop their individual or collective ability to perform their function, solve problem, and achieve their targets independently [18].

Consideration that must be taken care in capacity building is in terms of the capacity of institution and individual. Based on the research result, there were efforts regarding the capacity building in the forms of training and socialization about healthy city. The training was usually held by the Public Health Office of Makassar, Bappeda of Makassar City, and Persakmi. Activities that often held were healthy city training by Persakmi and training concerning waste management, nutrition counseling, and others.

However, the training and socialization sometimes were not effective. This is because the training and socialization held only based on the coordinators in the healthy city itself. So that training which is not only based on the coordinator but also on the people involved in the implementation of a healthy city needs to be done.

Sustainability

In-depth interview was conducted to all informants involved in this research, obtaining information regarding the sustainability aspect. In this case, the questions raised were related to the sustainability of the healthy city program in Makassar City and factors affecting the program sustainability as follows:

"I think it is already quite good because the community has started to change their lifestyle. In addition, Makassar also has obtained 4 highest appreciations for healthy city. Thus, it is expected that this year, we will get that again." (IK, Mamajang Sub-District, April 2019).

"It is expected that the continuity is sustainable. So far, it is very good and we targeted that we will get the fifth Swasti Saba Wistara appreciation." (AP, Tallo Sub-District, April 2019).

"The sustainability is already good because we have received 4 Wistara appreciations for the healthy city. It is expected that this year we will get the fifth one." (HW, Rappocini Sub-District, April 2019).

"The sustainability is very good seen from the appreciation Makassar City received related to healthy city." (AI, Wajo Sub-District, April 2019).

"I think it is already good proven by the appreciation received by the government of Makassar City in the category of Wistara for four times. There were also Padapa and Wiwerda that were received for so many times. Furthermore, there will also be a further assessment for healthy city, and Makassar

targeted to receive the fifth Wistara appreciation." (AH, Panakkukang Sub-District, April 2019).

The informants interviewed stated that the sustainability of healthy city program has been implemented well since the implementation of the program in 2007. The highest appreciation received was Wistara Appreciation that was received for four times. This information was delivered by the Head of Healthy City Forum of Makassar City and the Head of Public Health Office of Makassar City:

"For me, so far, the sustainability of the healthy city program in Makassar City is already good. Since its implementation in 2007, Makassar has been consistently changing to achieve the indicators of healthy city. It is expected to be continuously done in the future, regardless of whoever the leader is. The sustainability level is seen based on the appreciation received in every two years starting from Padapa, Wiwerda, to Wistara which already received for four times. We hope and optimistic that we will get the fifth one in the future." (NB, Head of KKS Forum of Makassar, April 2019).

"The health city program sustainability has been implemented continuously. This year assessment will be done in July 2019, and we targeted that we will receive the fifth Wistara." (SK, Public Health Office, Makassar, April 2019).

Furthermore, several information regarding the factors determining the sustainability of healthy city program in Makassar was also obtained as follow:

"Participation from both community and government is the most important thing. It is useless to make a movement if the government does not take any role in the implementation and vice versa. In Makassar, the government has involved the community to continuously cooperate and participate actively in maintaining the implementation of this program." (SR, Vice Mayor of Makassar, April 2019).

"First, You (Inayyah) need to be involved. All party must take a role, at least by maintaining the city to be clean, healthy, and safe by not littering, do not smoke in public place, and driving orderly." (AA, Bappeda of Makassar, April 2019).

"The main determining factor is the government, particularly the mayor. Coordination and involvement of all SKPD in Makassar City are also needed because there were seven orders and all sectors must be participated." (SK, Public Health Office of Makassar, April 2019).

Based on the information above, it is known that the main factor of the sustainability of the healthy city program in Makassar is active involvement and participation from the government, community, offices, and all related stakeholders. This is in line with the information delivered by the Head of Healthy City forum of Makassar City:

"Good involvement and commitment from the government, community, KKS forum, all offices, and all stakeholders were the main factors. In addition, strong cooperation and willingness are also needed." (NB, Head of KKS Forum Makassar, April 2019).

Information above proved that in addition to participation and involvement, commitment and willingness are also needed in implementing the healthy city program. The commitment and involvement from the healthy city forum of Makassar City are also really needed.

On the other hand, the following information received from the informants in sub-district level:

"At the level of sub-district, we expected that the municipal government will give financial support to conduct activities regarding healthy city because it is difficult for us to coordinate if the party above us are pointing at each other." (IK, Mamajang Sub-District, April 2019).

"The most important thing is budget must be provided and slums must be cleaned by the municipal government." (AN, Mariso Sub-District, April 2019).

"Government and community commitment need to be maintained to support the sustainability of healthy city program. Financial support is also expected." (AP, Tallo Sub-District, April 2019).

"Leader becomes the benchmark. If he has high commitment toward healthy city program implementation, then below him will follow automatically. In addition, financial issue needs to be repaired. It is expected that the municipal government will provide budget." (DR, Tamalate Sub-District, April 2019).

"As the organizer of the healthy city program, public health office must be more active. Financial aspect is the most important thing because not all community wants it independently and cannot be forced to participate." (AI, Wajo Sub-District, April 2019).

Recommendation

The level of involvement is one of the impacts in the implementation of a healthy city consisting of two indicators. An evaluation of the two indicators gave satisfactory results. The involvement of stakeholders in this matter is that women have been quite active and participatory. Besides that, the political commitment of the Makassar City government itself has succeeded in bringing satisfactory results to the development of the city. However, it is recommended for each SKPD at the city government level to further improve coordination with each other, because there are still overlapping tasks between each SKPD.

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Factors Related to the Incidence of Contact Dermatitis In-Fisherman on the Spermonde Island

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Abstract

BACKGROUND: Many factors can influence the occurrence of dermatitis; this factor is divided into two, namely exogenous and endogenous factors. Fishermen are jobs that are susceptible to disease in dermatitis, especially contact dermatitis in the small island.

AIM: This study aimed to determine the factors associated with the incidence of contact dermatitis in fishermen on the Spermonde islands.

METHODS: This study was an observational analytic study using a cross-sectional design study. This research was conducted on Lae-Lae, Barrang Lompo, and Lumu-Lumu Island in 2019. Samples in this study were 110 fishermen obtained using Accidental sampling techniques. Data collection is using research instruments.

RESULTS: Data analysis performed was univariate and bivariate analysis with a Chi-square test. Based on the results of the study, the research variables related to factors affecting contact dermatitis in fishermen in the Spermonde Islands were a history of skin diseases ($p = 0.000$), use of PPE ($p = 0.000$), personal hygiene ($p = 0.000$), and working period ($p = 0.003$) while unrelated factors are age ($p = 0.373$).

CONCLUSION: Fishermen should pay more attention to four factors, namely the history of skin diseases, the use of PPE, hygiene, and work period, to avoid contact dermatitis.

Introduction

The use of simple equipment causes the body of fishermen to be in direct contact with water, causing environmental-based diseases, one of which is a disease caused by work. Occupational diseases occur in fishermen caused by exposure to hazardous substances that occur during work [1]. Based on the types of organs that can experience abnormalities due to work, the skin is the organ most frequently affected by occupational diseases. Unconsciously, the work environment can be found materials, goods, or elements that can be harmful to the skin, irritate the skin, cause skin allergies, cause skin infections, or cause changes in skin pigment when attached to the skin, can even lead to skin cancer [2].

Dermatitis is a disease that can occur due to exposure to the skin. Dermatitis is inflammation of the skin in the epidermis and dermis in response to the influence of exogenous and endogenous factors that cause clinical abnormalities in the form of polymorphic efflorescence (erythema, edema, papules, vesicles, squama, and lichenification) and itching complaints [3]. The cause of this dermatitis can come from outside the body (exogenous), for example, chemicals detergents, acids, bases, oil, cement), physical (light, temperature), microorganisms (bacteria, fungi), or from the body (endogenous), for example, atopic dermatitis [4].

Based on data from the Barrang Lompo Community Health Center whose work areas cover six islands (Barrang Lompo Island, Barrang Caddi Island, Bonetambung Island, Lumu-Lumu Island, Lanjukang Island, and Langkawi Island), the incidence of dermatitis in the last 3 years, namely in 2016 dermatitis ranks fifth in the ten largest disease patterns are 545 cases, then in 2017 it increased to 916 cases and decreased in 2018 by 651 cases [5]. Based on the description above, the authors conducted a study to determine the relationship of environmental sanitation and the behavior of fishermen to the incidence of dermatitis in the Spermonde Islands.

Materials and Methods

This study was an observational analytic cross-sectional study design. The location of this study is on

three islands in the city of Makassar, namely on the islands of Lae-Lae, Barrang Lompo, and Lumu-Lumu. This research was carried out in February–August 2019. The population of this study was all fishermen in the islands of Lae-Lae, Barrang Lompo, and Lumu-Lumu. The sampling technique uses non-probability sampling, namely, accidental sampling. Data on factors related to the incidence of contact dermatitis in fishermen include the dependent variable (the incidence of dermatitis) and the independent variables (age, years of service, history of skin diseases, use of personal protective equipment, and personal hygiene). While for primary data collection, researchers were assisted by enumerators and health workers. Secondary data were obtained in the form of dermatitis data from related institutions, namely, Barrang Lompo Puskesmas, Riskesdas 2008 data, Makassar city health profile 2014, and literature related to this study. Data analysis was performed to determine the relationship between independent variables (age, years of service, history of skin diseases, use of personal protective equipment, and personal hygiene) on the dependent variable (incidence of dermatitis). The statistical test used is Chi-square using the following formula:

$$X^2 = \frac{N\left(|ad-bc|-n/2\right)^2}{(A+b)(C+d)(b+d)}$$

Results

The incidence of contact dermatitis

The incidence of contact dermatitis is obtained by diagnosis from a healthcare provider. The diagnosis is done by knowing the symptoms that cause contact dermatitis. The incidence of contact dermatitis in fishermen can be seen in Table 1.

Table 1: Fisherman distribution based on contact dermatitis in the Spermonde Islands

The incidence of contact dermatitis	Frequency					
	Lae-Lae		Barrang Lompo		Lumu-Lumu	
	n	%	n	%	n	%
Positive	14	46.7	23	46	13	43.3
Negative	16	53.3	27	54	17	56.7
Total	30	100	50	100	30	100

Source: Primary data.

Based on the data in Table 1, it explains that the number of positive fishermen experiencing contact dermatitis was found on Barrang Lompo Island by 23 people (46%). Although the number of fishermen who had negative dermatitis more than those who tested positive for dermatitis, the number of fishers who tested positive for dermatitis was quite high, almost half of the total sample.

Table 2: Relationship between age and contact dermatitis in fishermen in Spermonde Islands, Makassar City

Age	The incidence of contact dermatitis				n	p
	Yes		No			
	n	%	n	%		
Young	38	48.1	41	51.9	26	p=0,373
Old	12	38.7	19	61.3	53c	
Total	50		60		110	

Source: Primary data.

The age and the incidence of contact dermatitis in fishermen

The relationship between age and the incidence of contact dermatitis in fishermen can be seen in Table 2.

The results of the study in Table 2 show that fishermen who are in the younger age category suffer more from contact dermatitis, amounting to 38 people compared to other age categories. Whereas the older age category suffered fewer contact dermatitis, that is, 12 people compared to other age categories. The value of p = 0.373 (p > 0.005) means that the hypothesis Ho is accepted and Ha is rejected. Then, it can be interpreted that there is no relationship between age and the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar.

Duration of work with contact dermatitis

The relationship of work period with the incidence of contact dermatitis in fishermen is shown in Table 3.

Table 3: Relationship between work duration and contact dermatitis in fishermen in Spermonde Islands, Makassar City

Duration of work (Years)	The incidence of contact dermatitis				Total	p
	Yes		No		n	
	n	%	n	%		
≥ 5	43	54.4	36	45.6	79	p=0.003
< 5	7	22.6	24	77.4	31	
Total	50		60		110	

Source: Primary data.

The results of the study in Table 3 show that the majority of fishermen with more than 5 years of work experience contact dermatitis in the amount of 43 people (54.4%). Whereas fishermen who work < 5 years' experience fewer contact dermatitis, namely 7 people (22.6%). The number of fishermen who did not suffer from contact dermatitis was more than 5 years, namely 36 people, whereas fishermen with < 5 years of service experience fewer than 24 people with contact dermatitis. The value of p = 0, (< 0.005) which means that Ho is rejected and Ha is accepted. Hence, it can be interpreted that there is a relationship between the lengths of work with the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar.

History of skin diseases with the incidence of contact dermatitis

The relationship between the history of skin disease and the incidence of contact dermatitis in fishermen in Table 4

Table 4: Relationship between skin disease history and incidence of contact dermatitis in fishermen in the Spermonde Islands, Makassar City

The history of skin disease	The incidence of contact dermatitis				Total	p
	Yes		No		n	
	n	%	n	%		
History	31	96.9	1	3.1	32	
No history	19	24.4	59	75.6	78	p=0.00
Total	50		60		110	

Source: Primary data.

The results of the study in Table 4 show that the category of fishermen who have a history of skin disease and suffer from contact dermatitis are 31 people (96.9%) higher than those who have no history and suffer from contact dermatitis only 19 people (24.4%). While fishermen who did not suffer from contact dermatitis more had no history of skin disease, as many as 59 people (75.6%) while those who had a history of skin disease as much as one person (3.1%). The value of p = 0.000 (< 0.005) means that Ho is rejected and Ha is accepted. Hence, it can be interpreted that there is a relationship between the history of skin diseases and the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar.

Use of personal protective equipment (PPE) with the incidence of contact dermatitis

The relationship between the use of PPE and the occurrence of contact dermatitis in fishermen is shown in Table 5.

Table 5: Relationships between personal protective equipment use and the incidence of contact dermatitis on fishermen in the Spermonde Islands of Makassar

PPE	The incidence of contact dermatitis				Total	p
	Yes		No		n	
	n	%	n	%		
No complete	43	65,2	23	34,8	66	
Complete	7	15,9	37	84,1	44	p=0,0
Total	50		60		110	

Source: Primary data.

The results of the study in Table 5 show that fishermen who are included in the category of incomplete PPE use more contact dermatitis in the amount of 43 people (65.2%), compared to fishermen who use a complete PPE only seven people (15.9 %). While fishermen who did not suffer from contact dermatitis were more included in the category of complete PPE use, as many as 37 people (84.1%) compared to those using incomplete PPE that were 23 people (34.8%). The value of p = 0,000 (p < 0,005) means that Ho is rejected and Ha is accepted. Hence, it can be interpreted that there is a relationship between the uses of PPE with the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar.

Table 6: Relationship between individual hygiene and the occurrence of contact dermatitis in fishermen in Spermonde Islands, Makassar City

Individual hygiene	The incidence of contact dermatitis				Total	p
	Yes		No		n	
	n	%	n	%		
Not good	15	100	0	0.0	15	p=0,000
Good	35	36.8	60	84.1	95	
Total	50		60		110	

Source: Primary data.

Personal hygiene with the incidence of contact dermatitis

Based on research has been done, the data obtained about the relationship between individual hygiene and the incidence of contact dermatitis in fishermen in Table 6.

The results of the study in Table 6 show that fishermen who suffer from contact dermatitis and are included in poor individual hygiene are as many as 15 people. While fishermen who suffer from contact dermatitis and have good hygiene are more as many as 35 people. Sixty fishermen do not suffer from contact dermatitis and are included in the category of good personal hygiene. The value of p = 0.000 (p < 0.005) means that Ho is rejected and Ha is accepted. Then, it can be interpreted that there is a relationship between individual hygiene and the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar.

Discussion

Respondents in this study were 110 fishermen. The respondents are on several islands such as (Lae-lae Island, Barrang Lompo Island, and Lumu-Lumu Island). Based on age distribution, most fishermen are included in the young category and the least are fishermen who are in the old category. This states that most respondents were of productive age.

Of all the respondents, it was found that those with contact dermatitis were 50 people, and those who did not have contact dermatitis were 60 people. The fishermen who experienced contact dermatitis was highest affected in the arm of the hand by 28.2%. The high incidence of contact dermatitis on the arm of the hand is caused because when the fishermen are working, most fishermen do not wear clothes that cover all parts of the hands and also gloves so they cannot protect the hands from the dangers that can cause contact dermatitis.

In this study, one of the variables assessed was the length of service of fishermen. Fishermen who are included in the category have a working period of ≥ 5 years (long) more than fishermen who work <5 years (new). Fishermen who work long hours can increase the chance of contact dermatitis from fishermen who have a new working period.

Individual hygiene in this study is divided into two categories, namely the good category and the bad category. More fishermen who had personal hygiene were included in the good category at 86.4%, while fishermen who were included in the category had less personal hygiene at 13.6%. This shows that more fishermen pay attention to personal hygiene than those who do not.

Individual hygiene is very influential on health, especially skin health [7] in fishermen because fishermen who incidentally work at sea that can cause skin diseases if they do not maintain their hygiene properly.

The incidence of contact dermatitis that occurs in fishermen can also be caused by fishermen themselves. During data collection, researchers found many fishermen who did not care about their safety. Some fishermen do not use personal protective equipment so that it can increase the possibility of irritation from the workplace environment. According to several testimonies from respondents who did not wear personal protective equipment, this was due to fishermen who claimed that they were lazy to wear gloves. Respondents who fall into the good category in the use of PPE are less that is equal to 40% while respondents who fall into the bad category are more equal to 60%.

In the bivariate analysis, the results of the Chi-square and Fisher's exact statistical tests were independent and dependent variables. The variables associated with the incidence of contact dermatitis are variables of skin disease history, years of service, personal hygiene, and the use of PPE, while the variables not related to contact dermatitis are age.

The conclusion of the study of factors related to the incidence of contact dermatitis in fishermen, namely: There is no relationship with age of contact dermatitis in fishermen in the Spermonde Islands, Makassar City, but there is a relationship between the history of skin diseases, years of service, use of personal protective equipment, and personal hygiene with the incidence of contact dermatitis in fishermen in the Spermonde Islands of Makassar City.

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Analysis of Cancer Patients Characteristics and the Self-ruqyah Treatment to the Patients Spiritual Life Quality

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Abstract

AIM: The research aimed is to analyze the characteristics of cancer patients and the self-ruqyah treatment to the spiritual life quality among patients.

METHODS: The research used the analytical observation studies with 20 respondents who were selected using the purposive sampling technique. In the research, the depression was measured with the beck depression inventory and the quality of life was measured with (FACT-G) and the spiritual life quality with FACIT Sp.12 (the functional assessment of the chronic illness therapy spiritual) on the case (experimental). Namely, 10 cancer patients undergoing radiotherapy who participated in the self-ruqyah treatment program and the control group, namely 10 patients who did not participate in program. After 25 days, the cancer patients of both groups were examined their cortisol saliva and were measured their levels of depression, life quality, and spiritual life quality.

RESULTS: This study illustrates that the number of cancer patients are more female (65%) than male (35%). Then, the risk of the age group, then the age range most often found in this study is the age range of 40–49 years which is as much as 55%, then the age of 50–59 (25%) and the rest in the young age group (20%). The number of respondents sampled in this study was mostly found in the middle/junior high school education gap of 40%, not at school or elementary school at 35% and respondents who had a Strata education of 25%. Most all patients who were sampled in this study had a permanent job of 30% as civil servants or 25% private, the rest stopped working because of suffering from this disease as much as 30%.

CONCLUSION: There are differences in the average value of quality of life in cancer patients who do independent ruqyah therapy and who do not do ruqyah independently.

Introduction

Within a period of 10 years, it was seen that the ranking of cancer as a cause of death rose from rank 12 to rank 6. Every year there are estimated to be 190 thousand new sufferers and one-fifth will die from this disease [1]. Indonesia was a developing country with a fairly high prevalence of cancer. In the ASEAN region, Indonesia ranks second after Vietnam with cancer cases reaching 135,000 cases per year. The data are almost the same as that found by the Center for Data and Information Pusdatin) Ministry of Health of the Republic of Indonesia (2007) which mentions the prevalence of cancer reaching 100 thousand per year. In Indonesia, cancer is the second leading cause of death after heart disease [2], [3].

Quality of life according to the World Health Organization Quality of Life (WHOQOL) Group is defined as an individual's perception of the position of individuals in life in the cultural context and value system in which individuals live and their relationship to goals, expectations, standards set, and one's attention. One of the instruments for QL is WHOQOL-BREF. This instrument includes four dimensions: (1) Physical health, including daily activities; dependence on drugs; energy and fatigue; mobility; pain and discomfort; sleep and rest; and work capacity; (2) psychological welfare, including bodily image and appearance; negative feelings; positive feelings; self-esteem; spiritual/religious/personal beliefs, thinking, learning, memory, and concentration; (3) social relations, including personal relationships, social support; and sexual activity; (4) relationship with the environment, including financial resources; freedom, security, and physical safety; health and social care including accessibility and quality; home environment, the opportunity to get a variety of new information and skills; participation and the opportunity to engage in recreational and leisure activities; physical environment including pollution/noise/traffic/climate; and transportation.

M. Faisal Idrus [4] conducted research on HIV/AIDS sufferers, amounting to 20 patients as a treatment group and 20 patients as a control group. This study uses a quasi-experimental pretest-posttest control group design. From the results of the study, respondents who participated in spiritual psychotherapy through prayer and Dhikr (explanation) by AIDS patients experienced

a significant increase in serum CD4 + levels and decreased depression [4].

Radiotherapy is a treatment aimed at the possibility of survival of cancer patients after adequate treatment. However, the side effects of radiotherapy allow the emergence of negative physical and psychological impacts on cancer sufferers. Changes in the body's systems and functions that occur in cancer patients can cause disruption of the patient's self-concept that will result in a decrease in the functioning of the body so that sufferers depend on others to meet their basic needs. Changes in self-image due to self-concept disorders occur in all cancer patients and if these changes are not integrated with self-concept, it will result in a decrease in the quality of life [5].

Based on the description, the researchers felt the need to conduct research that sought solutions so that cancer patients who underwent radiotherapy and were at risk of experiencing depression and loss of meaningful spiritual life through a religious psychotherapy approach using the self-ruqyah method (self-healing) as part of alternative interventions in the concept of palliative care in cancer sufferers.

Materials and Methods

This type of research used in this study, researcher used the observational analytic with 20 respondents who were selected using the purposive sampling technique. The research measured the depression score using the beck depression inventory and the life quality (FACT-G) and the spiritual life quality FACIT Sp.12 (The Functional Assessment of the Chronic Illness Therapy Spiritual) on the case group (experimental) namely 10 cancer patients undergoing the radiotherapy who participated in the self-ruqyah treatment program and the control group namely 10 patients who did not participate in the program.

Place and time of research

This research was conducted from February to March 2016 in the Radiotherapy Unit of Hasanuddin University Hospital, Makassar, South Sulawesi Province.

Research population

The population in the study was all cancer patients who underwent complete radiotherapy at the hospital Hasanuddin University, February to March in 2016.

Research samples

The sample in this study was cancer patients who underwent radiotherapy for 25 days in the hospital, Hasanuddin University meets the inclusion criteria. The sampling technique in this study uses purposive sampling, which is to determine samples that fit the inclusion criteria of 20 respondents selected as samples. In the beginning, the researchers found 26 samples that were willing to be sampled, but in the implementation, there were six samples that dropped out because three people did not continue therapy, two people did not give news, and one person died.

Sample size

Initially, the study was established using the randomized control group pretest-posttest design model. However, due to the number of cancer patients registered in the radiotherapy installation medical records section who met the inclusion criteria who were willing to be respondents in the two treatment and control groups, only 26 people were divided into 13 treatment groups and 13 control groups. There were two respondents who were initially in the treatment group but because in the observations, they were unable to carry out independent ruqyah on the grounds that they were inconsistent in the therapy visit and inconsistent in carrying out ruqyah, so the researchers included them in the control group. Then, in the observation of 25 days out of 15 people in the control group who were able to survive only 10 people, three others dropped out because they returned to their area two people who had no communication; one person in the treatment group died on the 10^{th} day of observation. Hence, with a total population of 20 people, methodologically, randomization does not meet the conditions. Therefore, 20 patients who met the inclusion criteria were determined as the study sample, so this study was called total sampling.

Drop out criteria

Research subjects who could not participate in the Ruqyah Mandiri program in the treatment group for 25 days on the grounds that there was no communication so that they were not present at the time of data collection and saliva or died.

Results

The results of this study illustrate the number of cancer sufferers more female sex that is equal to 65% while male respondents as much as 35% (Table 1).

Table 1: Distribution of cancer patients by gender of cancer patients undergoing radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Sex	Group				Total	%
	Intervention	%	Control	%		
Male	5	50	2	20	7	35
Female	5	50	8	80	13	65
Total	10	100	10	100	20	100

The risk of the age group, then the age range most often found in this study is the age range of 40–49 years which is as much as 55%, then the age of 50–59 (25%) and the rest in the young age group (20%). This is in accordance with cancer studies that have been done showing this age range is the latent period of the pre-invasive phase to become invasive which takes 7–10 years, so most of it is known after age in this range (Table 2).

Table 2: Distribution of cancer patients by age group of cancer patients who underwent radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Age	Group				Total	%
	Intervention	%	Control	%		
30–39	2	20	2	20	4	20
40–49	6	60	5	50	11	55
50–59	2	20	3	30	5	25
Total	10	100	10	100	20	100

The number of respondents sampled in this study was mostly found in the middle/junior high school education gap of 40%, not at school or elementary school at 35% and respondents who had a Strata education of 25% (Table 3).

Table 3: Distribution of cancer patients based on cancer patients education who underwent radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Education level	Group				Total	%
	Intervention	%	Control	%		
Basic school	4	40	3	30	7	35
Junior and senior high school	4	40	4	40	8	40
Higher education	2	20	3	30	5	25
Total	10	100	10	100	20	100

Almost all patients who were sampled in this study had a permanent job of 30% as civil servants or 25% private, the rest stopped working because of suffering from this disease as much as 30% (Table 4).

Table 4: Distribution of cancer patients by type of cancer patients work undergoing radiotherapy at the hospital Hasanuddin University Makassar Period February-March 2016

Occupation	Group				Total	%
	Intervention	%	Control	%		
Civil servant	3	30	3	30	6	30
Businessman	3	30	2	20	5	25
Farmer/worker	1	10	2	20	3	15
Not work	3	30	3	30	6	30
Total	10	100	10	100	20	100

Most of the respondents in the study were married and 85% and 10% were divorced and one person or 5% of respondents were not married (Table 5).

Table 5: Distribution of cancer patients based on the marital status of cancer patients undergoing radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Marital status	Group				Total	%
	Intervention	%	Control	%		
Marriage	10	100	7	70	17	85
Divorce	0	0	2	20	2	10
Not marriage	0	0	1	10	1	5
Total	10	100	10	100	20	100

Table 6 illustrates that cancer is more dominated by female organ cancer, namely cervical cancer (35%), breast (25%), and men more suffering from nasopharynx cancer (25%) and the remaining SCC cancer (15%) and 5% who suffer from the disease lung.

Table 6: Distribution of cancer patients by type of diagnosis of cancer patients undergoing radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Cancer diagnosis	Group				Total	%
	Intervention	%	Control	%		
KNF	3	30	2	20	5	25
Cervix	4	40	3	30	7	35
Mammae	1	10	3	30	4	20
SCC	2	20	1	10	3	15
Lung	0	0	1	10	1	5
Total	10	100	10	100	20	100

On average new cancer patients are detected and treated at the hospital when entering Stage III (60%) and Stage II as much as 35% while the remaining one is at Stage IV (5%). The period of diagnosis of cancer patients is more in the span of 1–2 years (55%) and the period of more than 3 years is 30%. This proves that the changes in the body's systems and functions that occur in cancer patients that cause pain symptoms are very fast development and disrupt the quality of life of cancer sufferers (Table 7).

Table 7: Distribution of cancer patients based on the stage of cancer patients undergoing radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Cancer stadium	Group				Total	%
	Intervention	%	Control	%		
II	2	20	5	50	7	35
III	7	70	5	50	12	60
IV	1	10	0	0	1	5
Total	10	100	10	100	20	100

Table 8 illustrates the length of diagnosed patients generally ranges from less than a year (40%) and the length of diagnosed patients ranges from 1 to 2 years by 30% and respondents who have been diagnosed for longer than 3 years by 30%.

Table 8: Distribution of cancer patients based on the length of diagnosed with cancer patients who underwent radiotherapy at the hospital Hasanuddin University Makassar period February-March 2016

Diagnoses duration	Group				Total	%
	Intervention	%	Control	%		
<1 year	2	20	6	60	8	40
1–2 year	3	30	3	30	6	30
>3 year	5	50	1	10	6	30
Total	10	100	10	100	20	100

Discussion

Effect of self-ruqyah to the improvement of cortisol level of cancer patient

Long-term stress and depression will result in a continuous flow of the hormones adrenaline and cortisol into the blood and cause damage to the body's systems. High adrenaline levels that last for a long time can increase heart rate and blood pressure to a point where the body is accustomed to this state and assume this is a normal condition. High levels of adrenaline

can cause blood to clot more easily and cause clogged arteries, thyroid to be overactive, and the body to produce more cholesterol. This, of course, can result in body crunching which results in terminal diseases such as cancer, diabetes, and stroke [6].

Herbert Benson in his book entitled Healing Faith states that certain meditation and prayer movements can be used to evoke a relaxation response. Where the movement is actually a simple technique consisting of a four-step procedure that includes; (1) find a quiet environment, (2) consciously relax the muscles of the body, (3) concentrate for ten to twenty minutes on mental devices, such as one words or short prayers, and (4) be passive about the mind-disturbing thoughts by Herbert Benson and William Proctor [7]. Research has found how many psychological treatments explain the decline in body stimulation conditions caused by stress. The most well-known psychological method is progressive meditation and relaxation. The relaxation response method found by Herbert Benson can actually be found when people pray or Dhikr. For meditators or people who frequently do activities such as Dhikr also produce more alpha waves, namely brain waves associated with relaxation or calm/relax points [8]. The combination of relaxation response techniques with individual belief systems such as the independent ruqyah movement is actually a movement that represents the whole simple technique that Herbert Benson calls Faith Factor.

Effect of ruqyah Mandiri on decreasing depression of cancer patients

Humans have a balance regulating mechanism in the body's metabolic system known as homeostasis, for example the skin's pores shrink from cold to avoid loss of body heat. When we react positively to mild stress, PMOC (proopiomelanocortin) is formed by the adrenal cortex hormone that relieves physical stress. In addition, beta-endocrine which counteracts psychological stress will also be released. Interestingly, beta-endorphins are antidotes to stress if we react with positive thoughts. Conversely, the two hormones will not be released if we react negatively and reject. The conclusion is that the body will produce substances that function as drugs if every stimulus is responded with positive thoughts [8]. With positive thinking, the objects that are around us will depend on how we perceive and perceive them. Conversely, if a person often does negative mental activities, such as negative thinking, he will be encouraged to always think negatively [9].

The results of this study are in line with research conducted by Faisal Idrus, who examined the role of spiritual psychotherapy in providing peace, peace, and happiness of the souls of people with HIV/AIDS. Faisal's research concludes that mental calm is expected to reduce depression which will evoke an individual body's immune response [10]. Another study that supports the results of this study is a study conducted by Subandi that assesses Dhikr also has a high therapeutic value. Stress and depression have effects on psychological health and health care needs because depressed patients increase their stay in the hospital and increase the cost of medical services, in addition to affecting the quality of life of patients and their families [11].

The influence of negative thoughts and emotions will trap someone in the maladaptive coping mechanism by Antoni [12] so that it will hamper the function of integration, breakdown growth, and reduce autonomy and tend to control the environment, such as withdrawal attitude, do not want to tell the problem of pain, finish yourself in bed, and prejudiced against the destiny of his Lord. Biologically, stress can cause the liver to produce more free radicals in the body. Besides, stress can affect and decrease the body's immune function (immunity), so it is vulnerable to infectious diseases and cancer. If stress cannot be overcome, it will continue to become depressed [13].

Effect of self-ruqyah in improving the quality of life of cancer patients

Recent research results conclude that neuropsychological complications (such as emotional, behavioral, and cognitive disorders) can not only have a negative impact on the social functioning of stroke patients and their overall quality of life but also have an influence on healing their motor functions. The implication, the development of skills and religious behavior or religious coping is highly recommended as strength for individuals to face the demands of increasing work stress [15]. Psychophysiological effects of distress have a negative impact on the physical and psychological health of individuals. The sympathetic nervous system works through the stimulation of the hypothalamus and spinal cord due to stress stimulation. The operation of the sympathetic nervous system has an impact, among others, namely increasing blood pressure, increasing total energy consumption, increasing blood pressure, increasing total energy consumption, increasing blood glucose concentration, increasing energy release in muscles, increasing muscle tension, increasing mental activity, and increase the level of blood coagulation [16].

The influence of self-ruqyah on improving quality of life

Spiritual cancer patients

Based on the results of statistical tests on the variable quality of spiritual life, it is known that there are differences in the mean, so it can be concluded that there is a relationship between the independent ruqyah program to increase the spiritual quality of life of cancer patients undergoing radiotherapy. The difference in the score of quality of spiritual life during therapy before and after the intervention of religious psychotherapy illustrates

that the spiritual quality of life of cancer patients has increased significantly. The results of in-depth interviews with respondents who have done an independent ruqyah feel an increase in the quality of spiritual life that has a positive impact on their positive emotions on the environment of their friends and family. There are three subscales measured from the FACIT spiritual quality of life scale. The three scales are (1) meaningfulness of life which is a description of the reason he lives, the meaning and purpose of life felt by the sufferer, (2) peace, comfort, and perceived harmony sufferers, and (3) efforts to strengthen their faith and strength in perceived faith, and belief in healing (Peterman *et al*., 2002).

Conclusion

1. There are differences in the mean cortisol levels in cancer patients who do independent ruqyah therapy and who do not do independent ruqyah
2. There are differences in the mean value of depression in cancer patients who do independent ruqyah therapy and who do not do ruqyah independently
3. There are differences in the average value of quality of life in cancer patients who do independent ruqyah therapy and who do not do ruqyah independently

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