








Healthy Family Index of Families with Children Experiencing Stunting

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Abstract

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BACKGROUND: Stunting is a global problem that has a long-term impact on the quality of human resources. The stunting prevention can be achieved through out supervision during the first 1,000 days of life.

AIM: The study aimed to examine whether the health-conscious families can reduce and prevent stunting.

METHODS: The study location was in the operational area of Mifa Bersaudara Limited from March to September 2019. The research method used in this study was a quantitative observational study using a cross-sectional design. The instrument assessing the family health indicators issued by the Ministry of Health of Indonesia was used. The data were analyzed using the health-conscious family index formula and Z-score for the infant nutritional status. The study participants were 293 families with toddlers.

RESULTS: The study results show that the families living surrounding the operational area of Mifa Bersaudara Limited are mostly pre-healthy families (51.5%) with more than 30% (n=88) of stunted children. There is a relationship between healthy family index and stunting (p-value<0.05). The logistic regression test shows a significant relationship between the incidence of stunting and the families following the family planning program, exclusive breastfeeding, toddlers receiving monitoring, and no family members who smoke.

CONCLUSION: Stunting is associated with health-conscious families. The incidence of stunting in infants and toddlers is associated with families that plan the pregnancy spacing (family planning), babies getting exclusive breastfeeding, toddlers getting growth monitoring, and no smoking family members.

Introduction

The nutritional status of the body is determined a balance between the body's nutrient intake and nutritional needs [1]. The strategic importance of nutritional status in Indonesia's human development efforts places it as one of the health sector priorities of the National Medium-Term Development Plan, which aims to minimize the prevalence of undernutrition and short stunting [2].

Stunting is a condition in children caused by long-term malnutrition, in which the child's growth does not correspond to their age [3]. In Indonesia, it is estimated that 37.2% of children aged 0–59 months, or around 9 million children, experience stunting, which persists until the age of 6–18 years [4]. Stunting begins during pregnancy when an adolescent becomes an undernourished and anemic mother. It deteriorates more during pregnancy with inadequate nutritional intake, especially if the mother lives in an unsanitary environment [5]. To overcome the problem of stunting, efforts must be made to reduce it with supervision

during the first 1,000 days of a child's life to determine whether nutritional requirements for their growth and development can be fulfilled [6].

Mifa Bersaudara Limited was founded on January 14, 2002 and was ratified by the Decree of the Minister of Law and Human Rights No. C-03647. HT01.01.TH.2002 regarding ratification of the Deed of Establishment of a Limited Company. Since 2012, when PT. Mifa Bersaudara began exploring coal mines in West Aceh, the families living in the company's vicinity have often faced problems such as stunting, which is caused by the coal [7].

With the resulting issues, it is critical to conduct a study of the healthy family index. It is important that everyone in the operational area of Mifa Bersaudara Limited understands the value of health. This study will determine whether or not families with a healthy family index can prevent their children from being stunted. The purpose of this study is to examine the healthy family index of families with children experiencing stunted growth in the operational area of Mifa Bersaudara Limited, in West Aceh Regency.

Materials and Methods

This is a quantitative study with a cross-sectional design. It was conducted between March and September 2019 in the working area of Mifa Bersaudara Limited, West Aceh Regency, which has two rings: Ring 1 consisting of operational crossing village and port village and Ring 2 consisting of non-operational crossing village. The study measured the healthy family index in Ring 1 village, consisting of nine villages: Peunaga Cut Ujong Village, Buloh Village, Bukit Jaya Village, Sumber Batu Village, Balee Village, Paya Baro Village, Reudeup Village, Pucok Reudeup Village, and Suak Puntong Village. The population consisted of all families in the area, which totaled 1,133 households, with the target demographic being those with toddlers. Thus, respondents, who lived in the operational area of Mifa Bersaudara Limited, had toddlers, and were willing to participate in this research met the inclusion criteria. These criteria resulted in a sample size of 293 families for the study. The data, collected using the family health indicators issued by the Ministry of Health of Indonesia, have a high level of validity and reliability. They were analyzed using the healthy family index and the z-score formulas.

The research was conducted in the following stages [8]: First, a coordination meeting was held with the Community Health Center of Meureubo and Padang Rubek, which serve as the health centers within Mifa Bersaudara Limited's operations region. Second, a survey of family indicators was conducted. Third, each household was classified as healthy, pre-healthy, or unhealthy. A healthy family index was calculated (< 0.5 was considered unhealthy, 0.5–0.8 was considered pre-healthy, and > 0.8 was considered healthy). Fourth, the nutritional status of children under the age of five was determined using the bodyweight/age, body height/age, and body weight/body height formulas. Fifth, the z-score test was used to determine the value comparison. The following formula was used [5]:

$$Z\text{-score} = \frac{\text{Subject Individual Value} - \text{Referenced Standard Median Value}}{\text{Referenced Standard Deviation Value}}$$

This study did not require ethical approval as the questionnaires used and measurement conducted are standard practices that health workers always do during the Puskesmas and Posyandu activities. Moreover, all data are properly anonymized, and informed consent from participants was asked at the time of data collection. Later in this study, univariate, bivariate, and multivariate analyses were used to analyze the data. The Chi-square test was used for bivariate analysis, while the logistic regression test was used for multivariate analysis. Finally, the instrument used in this study is an instrument modified from the Ministry of Health measuring family health indicators.

Results

As illustrated in Figure 1, each village has a case of stunting, with the highest rate of 43.42%.

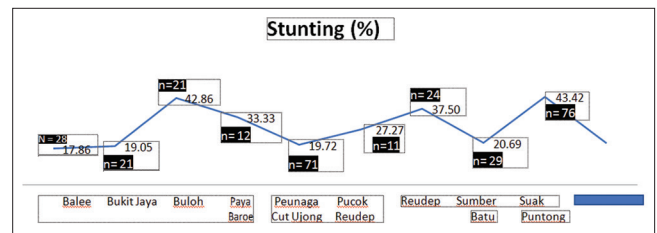


Figure 1: Stunting frequency distribution in the operations area of Mifa Bersaudara Limited

As shown in Table 1, the majority of families with normal growing infants and toddlers received exclusive breastfeeding (69.1%), completed immunization (62.6%), participated in family planning (69.8%), had clean water facilities (66.4%), and had no family members who smoked or were exposed to smoking (69.2%).

Table 1: An overview of family health indicators associated with stunting

Indicators of family health	Stunting (n = 125)		Normal (n = 168)		Total = 293	
	f	%	f	%	F	%
Families participating in family planning	42	30.2	97	69.8	139	100
Receiving maternity care in a health facility	103	39.8	156	60.2	259	100
Receiving complete immunization	68	37.4	114	62.6	182	100
Having toddlers who are exclusively breastfed	47	30.9	105	69.1	152	100
Having toddlers whose growth is monitored	100	47.2	112	52.8	212	100
Having family members who are non-smokers or who have never been exposed to smoking	68	30.8	153	69.2	221	100
Possessing national health insurance	106	46.3	123	53.7	229	100
Having access to clean water	51	33.6	101	66.4	152	100
Healthy latrines relate to the incidence	70	35.5	127	64.5	197	100

Table 2 shows that 42.7% of 293 toddlers are stunted. Statistical tests indicate that participation in family planning, exclusive breastfeeding, monitoring the growth of toddlers, and having family members who are non-smokers or who have never been exposed to smoking, possessing national health insurance, having access to clean water facilities, and healthy latrines all correlate with a lower prevalence of stunting (p < 0.05).

Table 3 is the final stage of analysis of this research. The result found that family health indicators, including participating in the family planning program, exclusive breastfeeding, access to growth monitoring, and family members who did not smoke, can explain stunting with the R² value of 35.4% (p<0.001). This model might be suitable for stunting prevention. The final model produced through several phases released is $Y = -1.628 + 1.046 X_1 + 0.993 X_2 + (-0.981) X_3 + 2.198 X_4$.

Table 2: Relationships between health-conscious families and stunting

Family Health Indicators	Stunting				Total		p	OR
	Yes		No		f	%		
	F	%	f	%				
Families participating in family planning								
Yes	42	30.2	97	69.8	139	100	0.000	2.7
No	83	53.9	71	46.1	154	100		
Mothers receiving maternity care							0.01	2.77
Yes	103	39.8	156	60.2	259	100		
No	22	64.7	12	35.5	34	100		
Babies receiving complete immunizations							0.026	1.77
Yes	68	37.4	114	62.6	182	100		
No	57	47.4	54	63.6	111	100		
Having toddlers who are exclusively breastfed							0.000	2.76
Yes	47	30.9	105	69.1	152	100		
No	78	55.3	63	80.8	141	100		
Having toddlers whose growth is monitored							0.017	0.5
Yes	100	47.2	112	52.8	212	100		
No	25	30.9	56	69.1	81	100		
Having non-smoking/smoke exposure to family members							0.000	8.555
Yes	68	30.8	153	69.2	221	100		
No	57	79.2	15	20.8	72	100		
Possessing national health insurance							0.026	0.49
Yes	106	46.3	123	53.7	229	100		
No	19	29.7	45	70.3	64	100		
Having access to clean water							0.002	2.187
Yes	51	33.6	101	66.4	152	100		
No	74	52.5	67	47.5	141	100		
Healthy latrines relate to the incidence							0.001	2.434
Yes	70	35.5	127	64.5	197	100		
No	55	57.3	41	42.7	96	100		

Discussion

Families not participating in family planning

The results show that most families did not participate in a family planning program (52.6). The results of the multivariate test revealed an Exp (B) of 2.846, indicating that families who did not participate in family planning were 2.86 times more likely to have stunted children. The number of families correlated with family food security. Toddlers who live with five to seven family members face a 2.97-fold increased risk of stunting than those who live with two to four family members. This is due to a lack of food availability when many people live in a single house [9]. Adjusting birth spacing is a precautionary measure to avoid unintended pregnancy and may help prevent stunting. In couples of childbearing ages, reproductive health interventions are integrated into family members' nutritional fulfillment relationships [10].

The findings indicate that families who used contraceptives to avoid pregnancy had a higher rate of supplementary feeding for children under the age of five [11]. The ideal number of family members impacts their ability to meet their children's nutritional needs. Mothers who are pregnant while their children are under the age of two are at risk of infant malnutrition associated with breastfeeding, weaning, and supplemental feeding [12].

Table 3: Multivariate Analysis

Family Health Indicators (X)	B Coefficient	p value	Exp (B)	R ²
Families Not Participating in Family Planning	1.046	0.000	2.846	0.354
Infants Receiving Exclusive Breastfeeding	0.993	0.000	2.700	
Toddlers Receiving Growth Monitoring	-0.981	0.003	0.375	
Having non-smoking/smoke exposure to family members	2.198	0.000	9.005	
Constant	-1.628			

Infants receiving exclusive breastfeeding

Breastfeeding is the optimal nutrition for infants aged 0–6 months. Exclusive breastfeeding boosts a baby's immune system five-fold, making it not impervious to disease, which also affects the incidence of stunting. Unfortunately, exclusive breastfeeding is still uncommon in this region, at 51.9%. The regression model shows that exclusive breastfeeding is highly effective in preventing stunting, with an Exp (B) value of 2.7, indicating that infants who did not receive exclusive breastfeeding were 2.7 times more likely to experience stunting.

Health promotion efforts in this region continue to encourage mothers to breastfeed exclusively, but achievements of targets remain extremely low. Mothers do not exclusively breastfeed their babies due to a cultural requirement that babies in *peucicap* be provided with drinks and other food items such as bananas. In addition, some mothers are working women [13]. According to the findings of Ashok *et al.* (2015), children who receive exclusive breastfeeding have a robust immune system, and the nutritional content of breast milk can help prevent stunting [9].

Toddlers receiving growth monitoring

Stunting is a complex phenomenon associated with malnutrition; however, monitoring toddler growth can help reduce the risk of stunting in toddlers. The results of a study of health-conscious families reveal that most toddlers (30.9%) who do not receive growth monitoring will experience stunting.

Family care contributes to a child's growth and development [14]. The goal of monitoring toddler growth is to prevent stunting. Inadequate feeding and care will lead to high rates of stunting among toddlers [15]. According to research conducted in India, households that monitor their children's growth every 2 weeks have a significant correlation with their children's growth of their children [16].

Smoking by family members

Toddlers who are often exposed to cigarette smoke are at risk of developing pneumonia and ARI, both of which are considered infectious diseases. According to Angina (2019), infectious diseases in children under the age of five are strongly associated with the prevalence of stunting [17]. Another research found that children who live in households that rely on solid fuels have a significantly higher risk of stunting [18]. The use of coal, a type of solid fuel [19], [20], by Mifa Bersaudara Limited may have an adverse effect on health, especially for infants and toddlers living in the company's operational area.

Families not having access to clean water

Stunting is associated with unsanitary water facilities. Access to clean water is a preventive measure against infectious diseases such as diarrhea. Mbuya *et al.* (2016) discovered that microbes ingested by humans could impair immunity, suppress growth, and inhibit bone growth, all of which correlate with the incidence of stunting in children [21]. Furthermore, Cha *et al.* (2014) found that poor sanitation can cause diarrhea [22]. Children who frequently contract infectious diseases, such as diarrhea, are at risk of malnutrition [23].

Possessing healthy latrines and practicing proper defecation

To improve family sanitation, each household must have a healthy latrine. Proper sanitation and waste management are critical for public health [24], [25]. The results of this study indicate that 32.8% of families have poor latrine facility. This situation results from several factors, including knowledge, family economy, and difficult-to-change habits. In contrast to, a study in children under 2 years shows that socioeconomic factor has not associated with stunting [26]. It is more affected by mothers' education which can determine healthy behavior. Within the study population, clean and healthy behavior are still not widely practiced in this region. This is because the area is remote from health services, and thus, the education for PHBS (healthy and clean behavior) is not conveyed effectively [27].

Conclusion

Health-conscious families have a significant impact on the incidence of stunting. This study discovered that a model of health-conscious family study is an appropriate model for the prevention of stunting. The model obtained from the study's findings is as follows: $Y = -1.628 + 1.046$ (families participating in the family planning program); $+ 0.993$ (infants receiving breast milk/exclusive breastfeeding); $+ (-0.981)$ (toddlers receiving growth monitoring); $+ 2.198$ (family members not smoking). Stunting is less prevalent in infants and toddlers whose families practice family planning, receive exclusive breastfeeding and growth monitoring, and have no family members who smoke.

Thus, it is suggested that in the Mifa Bersaudara Limited operations area, education is necessary to help the community to understand what constitutes a healthy family, as this contributes to the area's overall health status improvement. In addition, with CSR funds from Mifa Bersaudara Limited, a place called *Rumoh Gampong Sehat* (Healthy Village House)

can be established as a center for health literacy, public education about health, and sharing when the community experiences health problems.

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