Scientific Foundation SPIROSKI, Skopje, Republic of Macedonia
Open Access Macedonian Journal of Medical Sciences. 2021]; 9(G):143-148.
https://doi.org/10.3889/oamjms.2021.6627
eISSN: 1857-9655
Category: *G - Nursing*
Section: *Nursing in Gynecology and Obstetrics*

The Cultural Assessment Model as an Evaluation Indicator for Nutritional Adequacy in Pregnant Women with Pre-eclampsia

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Edited by: Mirko Spiroski
Citation: Azza A, Susilo C. The Cultural Assessment Model as an Evaluation Indicator for Nutritional Adequacy in Pregnant Women with Pre-eclampsia. Open-Access Maced J Med Sci. 2021 Oct 07; 9(G):143-148. https://doi.org/10.3889/oamjms.2021.6627
Keywords: Cultural assessment model; Nutrition; Pre-eclampsia
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Received: 13-Jun-2021
Revised: 25-Aug-2021
Accepted: 27-Sep-2021

Funding: This study was supported by University of Muhammadiyah Jember (Research Project number: 142/II.3.AU/LPPM/Research/2020)
Competing Interest: The authors have declared that no competing interest exists

Abstract

BACKGROUND: Pre-eclampsia is one of the complications of pregnancy in many communities with low socioeconomic conditions. The lack of intake of quality nutrition can be a precipitating factor in the occurrence of this complication.

AIM: This study aims to find out the nutritional adequacy for pregnant women through the transcultural model assessment using correlational design and a cross-sectional approach in pregnant women at the third trimester.

MATERIALS AND METHODS: The diagnosis of pre-eclampsia was identified through a blood pressure of 140/90 mmHg and proteinuria. There were 222 samples with purposive sampling. The data were obtained through questionnaires and the interview results were used as secondary data. The data were analyzed using the Chi-square test, odds ratio (OR) with confidence intervals (CI) of 95%, and the alpha value of 0.05.

RESULTS: The analysis of the nutritional adequacy with the incidence of pre-eclampsia confirmed that the carbohydrate with OR of 5.250 (OR = 3.545, 95% CI = 2.098, 13.158), folic acid (OR = 16,838, 95% CI = 2.222, 127.64), and vegetable (OR of 4.00, 95% CI = 1.619, 9.885) which are related to the incidence of pre-eclampsia.

CONCLUSION: The fulfillment of the daily nutrition of pregnant women is greatly influenced by the culture and myth developed in society. An assessment using the transcultural model approach can give a lot of information about the influence of culture in pregnant women's daily life.

Introduction

Pregnancy is a physiological condition in the development of a woman's life [1], [2], [3]. Pre-eclampsia is one of the complications in pregnancy that case is likely to increase and at risk of being a major cause of mortality and morbidity in pregnant women and fetuses both in developed and developing countries [4], [5], [6]. Data on the incidence of pre-eclampsia in the developed countries range from 6% to 7% of all pregnancies, while the prevalence in developing countries goes to 16.7% and is estimated to cause approximately 40–60% of maternal deaths [6], [7], [8]. In Indonesia, the incidence of pre-eclampsia is 128.273 cases (20.22%) in 2019 and causes 24% of maternal mortality [9].

Another impact of pre-eclampsia is growth-related disorders, the development of intrauterine growth retardation [8], [10], [11], and intrauterine fetal death [12], [13]. Pre-eclampsia may occur during the antenatal, intrapartum, and postnatal with symptoms of hypertension, protein in the urine (proteinuria), and edema [6], [14], [15]. Although the cause of pre-eclampsia is still unclear, there seem to be some specific factors such as age, nulliparity, body mass index, mother's diet, hypertension, preexisting, history of pre-eclampsia, kidney disease, and diabetes mellitus [4], [16], [17], [18], [19].

Culture has an important role in the nutritional status of pregnant women because of several beliefs [20],[21], [22]. Habits of excessive food consumption for pregnant women, beliefs about dietary restrictions for pregnant women, and values related to health and religion that have been trusted since childhood can be a risk factor for preeclampsia [23], [24], [25].

An assessment model in pregnant women using the cultural model is one of the ways to find out the problems related to nutrition consumed by pregnant women [26], [27]. The transcultural approach is the cultural background oriented, such as values, beliefs, rules of behavior, and lifestyle practices that become the benchmark for thinking and acting [26], [28]. The mother needs social support during pregnancy to trigger her confidence to be well-prepared before having childbirth [29]. This study aims to find out the nutritional adequacy for pregnant women through the transcultural model assessment.

Materials and Methods

This study used a correlational design with a cross-sectional approach in pregnant women at trimester intended

to analyze the Transcultural Model Assessment (Figure 1) as an Indicator of Analysis the Evaluation of Nutritional Adequacy in Pregnant Women with Pre-eclampsia.

Data collection was performed in the unit of outpatient hospital referral for pre-eclampsia cases from June 2019 to June 2020. All pregnant women who came to the unit were the population in this study, the sampling technique was purposive sampling with the inclusion criteria of gestational age more than 28 weeks, with a sample of 222 pregnant women. Assessment of the diagnosis of pre-eclampsia was identified by measuring blood pressure of 140/90 mmHg or higher at least two measurements 4 h apart at gestational age over 20 weeks of gestation and laboratory diagnosis taken from urine showing protein excretion.

The data include primary data and secondary data. The first is obtained directly from pregnant women as a source of data through a questionnaire about eating habits in the past 3 months using the transcultural assessment is an assessment of family daily eating habits based on cultural values and dietary restrictions in families for pregnant women and interviews. The latter was obtained through document study of medical records or visiting cards.

The data analysis was performed using the Chi-square test, odds ratio (OR) with 95% confidence intervals (CI), and the alpha value of 0.05. To complement this study, the researchers presented quantitative data in the table of frequency on the results of culture and habits mapping of food consumption in pregnant women during pregnancy.

Ethical considerations

This study was approved by the Ethics Committee of the Faculty of Health Sciences, Muhammadiyah University of Jember (Number 307/KEPK/FIKES/IX/2020). Respondents were previously informed of the aims and procedures of the study. Furthermore, participation is voluntary with written informed consent obtained.

Results

Characteristics of pregnant women

The characteristics of pregnant women are presented in Table 1.

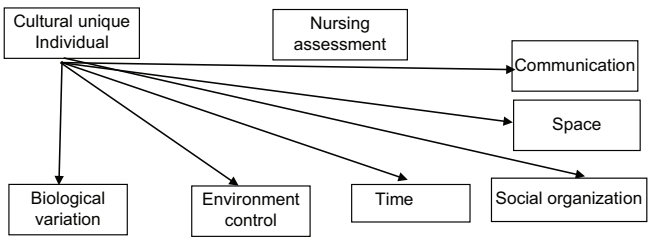

Figure 1. Giger and Dhavidizhar's Transcultural assessment model [30]

Table 1: The characteristics of pregnant women by age, educational background, occupation, household income, religion, ethnicity, and family structure (n = 222)

Variable	Frequency	%
Age		
<20	24	10.8
20–30	98	44.1
>30	100	45
Educational background		
Primary school	95	42.6
Junior high school	60	26.9
Senior high school	55	24.7
Higher education	12	5.4
Occupation		
Housewife	192	86.1
Laborer	21	9.5
Entrepreneur/self-employer	7	3.2
Civil servant	2	9
Household income		
<2 million rupiah	195	87.4
2–3 million rupiah	24	10.8
>3 million rupiah	3	1.4
Religion		
Islam	220	99.1
Christian	2	9
Ethnicity		
Javanese	40	18
Madurese	180	81.1
Other	2	0.9
Family structure		
Core family	82	36.8
Extended family	132	59.5
Joint family (living under one roof with own parents/parents-in-law)	8	3.6
Sub-total	222	100

Characteristics of nutritional adequacy by the cultural assessment

The characteristics of nutritional adequacy in pregnant women by daily nutrition are presented in Table 2.

Analysis of nutritional adequacy and incidence of pre-eclampsia

Analysis of nutritional adequacy and incidence of pre-eclampsia is presented in Table 3.

Based on the analysis of nutritional adequacy with the incidence of pre-eclampsia, the types of food (i.e., carbohydrates with p = 0.00 and the OR 5.250, protein with p = 0.004 (OR = 3.545, 95% CI = 2.098, 13.158), folic acid with p = 0.00 (OR = 16.838, 95% CI = 2.222, 127.64), and vegetable with p = 0.001 (OR of 4.00, 95% CI = 1.619, 9.885) are closely related to the incidence of pre-eclampsia in pregnant women. For those whose daily diet is excess of carbohydrates, there was a chance of pre-eclampsia 5.25 times compared to those whose daily menu is less carbohydrates. Those whose daily menu less was less in folic acid would be at risk of 17.667 times undergoing pre-eclampsia.

The result of beliefs and cultural practices during pregnancy such as the assessment of culture in support of the nutritional adequacy in pregnant women is presented in Table 4 while the assessment of prohibitions/abstinence on daily nutrition during pregnancy is listed in Table 5.

Table 2: Tabulation of frequency on characteristics of nutritional adequacy in pregnant women by daily nutrition (n = 222)

Variable of nutrition	Frequency		Mean	Standard deviation	Kurtosis
	Deficient	Sufficient			
Carbohydrates (rice, potatoes, sweet potatoes, corn)	43	179	1.8063	0.396	0.440
Protein (tofu, tempeh, eggs, fish, meat)	55	167	1.7523	0.432	0.621
Folic acid (sea fish, vitamins)	132	90	1.4054	0.492	–1.866
Fruit (all types of fruit)	10	212	1.9550	0207	17.67
Milk (fresh milk, yogurt, formula milk)	102	120	1.5405	0.499	–1.991
Vegetables (all types of vegetables)	51	171	1.7703	0.421	–0.329
Calcium (calc)	119	103	1.4640	0.499	–1.997

Table 3: Analysis of nutritional adequacy and incidence of pre-eclampsia (n = 222)

Variable	Not pre-eclampsia	Pre-eclampsia	p-value	OR	CI 95%	
					Lower	Upper
Carbohydrate						
Deficient	11	32	0.00	5.250	2.098	13.158
Sufficient	11	168				
Protein						
Deficient	11	44	0.004	3.545	1.441	8.722
Sufficient	11	156				
Folic acid						
Deficient	21	111	0.00	16.838	2.222	127.64
Sufficient	1	89				
Fruits						
Deficient	10	0	0.00	17.667	10.197	30.607
Sufficient	12	200				
Milk						
Deficient	11	91	0.688	1.198	0.496	2.890
Sufficient	11	109				
Vegetables (all types of vegetables)						
Deficient	11	40	0.001	4.00	1.619	9.885
Sufficient	11	160				
Calcium (calc)						
Deficient	11	108	0.721	0.852	0.353	2.055
Sufficient	11	92				

Discussion

Pregnancy is a period that requires more attention, especially in the fulfillment of the nutritional needs of the mother and the fetus [31], [32]. Therefore, pregnant women require nutritious food to make themselves and their baby safe, especially during the conception period that consists of protein, vitamins, calcium, folic acid, and energy [15].

Table 4: Assessment of culture in support of the nutritional adequacy in pregnant women

Activities	Often	Rarely	Never
I got my pregnancy checked in a dukun	18	150	54
Parents/mother-in-law taught me about nutrition fulfillment during pregnancy	198	24	0
Community leaders taught me good culture for pregnant women	178	40	4
I ate to satiate during my pregnancy	169	37	16
I violated the culture of food consumption habits during my pregnancy	112	12	100
I violated the culture of food consumption habits during my pregnancy	180	40	2
The culture I profess prohibits pregnant women from consuming sea fish and shrimp	127	75	20
My family has important roles in deciding on food consumption during pregnancy	113	78	31
Pregnant women must obey the culture in society	180	22	20
Pregnant women should not consume supplements for blood since it can cause high blood pressure	89	68	65
I consume an alcoholic drink	0	0	222
I have to hold the 7th month pregnancy salvation	157	60	8
The food I consume must be cooked first	193	27	2
My religion forbids to consume non-halal food	222	0	0
The types of food for eating habits in my family consist of rice, vegetables, and side dishes	222	0	0
I consume foods that contain calcium in my daily menu (e.g. yogurt, milk, cheese)	15	89	118
I consume foods that contain folic acid in my daily menu (e.g. vegetables, broccoli, tomatoes, cereals, avocados)	45	98	78
I avoid consuming food prohibited by my culture during pregnancy	197	14	11

During the period of pregnancy, pregnant women need an extra intake of calories of 300–400 kcal per day [32], [33]. They should consume balanced daily nutrition to prevent them from the excess energy that leads to the risk of obesity during pregnancy [14], [15], [34]. The results of this study indicated that the consumption of daily nutrition containing carbohydrates is associated with the incidence of pre-eclampsia with the p = 0.00 (OR = 3.545, 95% CI = 2.098, 13.158). Consuming nutritious food during pregnancy is needed to get energy and support the growth and development of the fetus in the womb. However, a diet with excess carbohydrates will be at risk for pregnant women.

The need for folic acid in pregnant women, especially a few weeks before and after the beginning of pregnancy, is important for the growth of the fetus, the embryo requires folic acid for the formation of the nervous system and cells [35], [36]. An additional 400 μg of folic acid per day is necessary during the first trimester of pregnancy [24]. The results of this study showed that p = 0.00 (OR = 16.838, 95% CI = 2.222, 127.64) has a close correlation with the consumption of folic acid and the incidence of pre-eclampsia. Those who had a daily

Table 5: Prohibitions/abstinence on food to be obeyed by pregnant women during the pregnancy

Prohibitions/abstinence to consume	Effects believed by pregnant women
Ice	Faster growth (big) when toddler years and gradually become small
Meatball	The baby has a big body
Archidendron pauciflorum	The baby smells bad
Pineapple	Miscarriage
Salted fish	Itching on the mother
Thunnini and *Sardina pilchardus*	Bleeding
Banana	Womb displacement
Noodles	Womb displacement
Jackfruit	Womb displacement
Fruits with coincide structure	Conjoined (Siamese) twins

Source: Primary data.

menu with less folic acid have a risk of 16,838 times of pre-eclampsia.

According to a research team led by a researcher at Ottawa University, the intake of balance folic acid plays an important role in the development of the placenta [23]. Folic acid has benefits for the formation of endothelial cells, special cells lining the blood vessels throughout the body, and placenta. Other nutrients needed by pregnant women during pregnancy are 60 g of protein per day (more than 10 g than usual intake) [8], [15]. Protein can be obtained from meat, fish, egg white, legumes, tofu, tempeh, etc. [16]. The consumption of 1000 mg calcium per day is required to maintain the growth of bones and teeth, muscle contraction, and nervous system [37]. Vitamin A is beneficial for the maintenance of skin, eye function, and bone growth. Iron (Fe) is necessary for blood formation [38]. Vitamin C is beneficial to facilitate the absorption of Fe by the body, in addition to maintaining the health of teeth and gums [15], [39].

Pregnancy leads to an increase in energy metabolism since it needs energy and other nutrients during pregnancy [40]. The increase in energy and nutrients is required for fetal growth and development, the magnitude of organ content, changes in the composition, and metabolism of the mother's body. Accordingly, the lack of certain nutrients in pregnant women may cause risks and complications in their bodies. Many factors may affect the pattern of consumption for daily nutrition in pregnant women, one of them is cultural practices developed and believed in society [33].

In some regions of Indonesia, cultural practices related to pregnancy are preserved. Many rules and myths about abstinence developed in society and it highly affects pregnant women and their families in preparing for the daily menu [32]. The cultural assessment model is appropriate to be used to find out both the positive and negative effects, thus, it can identify the nutritional problems in the community. The concept of cultural assessment adopts the theory of Giger and Davidhizar transcultural assessment model [41], [42], [43].

Leininger (Tomey and Alligood, 2006) said that culture has vast effects on the lives of a family. This may have effects on the health behaviors of the family that includes the habits of daily living, work, social interactions, and health practices. Beliefs, values, culture, and norms that exist within the family may also affect the health of the family [44].

Conclusion

The fulfillment of daily nutrition in pregnant women is greatly affected by culture and myths developed and believed in society. The assessment using the transcultural model can give a lot of information about the effects of culture in the daily life of pregnant women.

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