

The Nutritional Knowledge and Nutritional Status of Pregnant Women in Aceh Besar: The Correlational Study

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ABSTRACT

OBJECTIVE: To identify the association between pregnant women's knowledge and nutritional status.

METHODOLOGY: This study was an observational correlation analytic study with a cross-sectional design. One hundred and one pregnant women were selected using a simple random sampling technique at six Aceh Besar community health centres in Aceh Province, Indonesia. A nutritional knowledge questionnaire was used to assess the knowledge, and nutritional status was measured based on the Pre-Pregnancy Body Mass Index (PP-BMI) of pregnant women and Maternal Weight Gain (MWG) during pregnancy.

RESULTS: The Chi-Square test results show a significant association between knowledge and maternal PP-BMI ($p=.000$), but there was no association between knowledge and MWG ($p=.710$).

CONCLUSION: Nutritional knowledge is essential for pregnant women because it can influence maternal nutritional status during pregnancy. It is hoped that all pregnant women will have self-awareness in gaining good knowledge about nutrition during pregnancy and that health workers will provide optimal nutrition education so that pregnant women are prevented from the risk of nutritional disorders.

KEYWORDS: Nutrition, Knowledge, Body Mass Index, Weight Gain, Pregnancy

INTRODUCTION

Nutrition is an essential factor that influences the health of the mother and fetus¹. During pregnancy, food intake in portions must be more significant, and the food consumed must contain enough macronutrients and micronutrients. Various sources of essential nutrients such as carbohydrates, protein, fat, vitamins, water, iron, and folic acid must be met².

Adequate knowledge of nutritional intake is recommended to help the mother achieve a healthy weight gain during pregnancy³. The better your knowledge, the more your nutritional status will increase⁴. Adequate nutritional intake during pregnancy will improve the mother's health status and prevent complications during pregnancy for the mother and fetus⁵.

Nutritional advice was found to hold evidence as a mainstay in improving protein intake and reducing the risk of preterm birth⁶. An ideal pre-pregnancy BMI and average weight gain during pregnancy are essential factors for the weight status of mother and baby⁷. The study results in America showed that the prevalence of pre-pregnancy 16,3% were underweight, 12,3% were overweight, and maternal overweight was associated with increased risk for macrosomia⁸. The systematic review examined that there was an association between maternal pre-pregnancy

overweight or obesity with the baby's neurodevelopmental cases⁹.

Lack of nutrition during pregnancy can be caused by lack of knowledge and inadequate food intake, disease, unavailability of adequate food sources, lack of health services, unhealthy household environment, poverty, and social and political problems¹⁰. The research results in Australia show that only 46.5% answered correctly about the Importance of crucial nutrients in pregnancy, and 48.8% understood Multivitamins and supplements during pregnancy¹¹.

METHODOLOGY

Study Design

A cross-sectional study was conducted from 11 July to 10 September 2023 among pregnant women in the work area of Aceh Besar Community Health Centers, Aceh Province, Indonesia. The research aims to identify the relationship between knowledge about nutrition and the nutritional status of pregnant women.

Population and Sample

The population in this study was all pregnant women in Aceh Besar. The sample size is determined based on previous research. One hundred one pregnant women were selected by simple random sampling technique at six Aceh Besar community health centres in Aceh Province, Indonesia, which are sub-district Ingin Jaya, Blang Bintang, Krueng Barona Jaya, Kuta Baro, Darul Imarah, Baitussalam and Darussalam health centres. All respondents were studied during pregnancy visits at the community health centre. Pregnant women who are respondents are mothers who have had a pregnancy check-up at a community health centre and whose names have been recorded

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doi: 10.22442/jlumhs.2024.01134



on the Maternal and Child Health Polyclinic registration list.

Instrument

A nutritional knowledge questionnaire was used to assess the knowledge adopted from Nana & Zema's research about Dietary practices and associated factors during pregnancy in northwestern Ethiopia in 2018¹⁷. The questionnaire in English was translated into Indonesian and then back-translated to assess consistency. The nutritional status was measured based on the Pre Pregnancy Body Mass Index (PP-BMI) of pregnant women according to the pregnant women were divided into Very underweight (<17.0), Mild underweight (<17.0-18.4), normal weight (18.5–25 kg/m²), mild overweight (25.1-27) and moderate overweight heavy (>27.0)¹⁸

Data Analysis

Descriptive statistics for socio-demographic variables including mother's age, gestational age, pregnancy interval, parity, monthly family income, the latest education, employment, upper arm circumference, anemia status, level of knowledge, PP-BMI and MWG. To assess the relationship between knowledge and PP-BMI and MWG using the chi-square test with a significance level of <0.05.

Ethical Statement

This research has received ethical permission from the Faculty of Nursing Ethics Committee at Syiah Kuala University, Banda Aceh, with number 113022060623. This research has also received approval from the Aceh Besar district health office. All respondents also obtained voluntary consent without coercion by signing the study informed consent.

RESULTS

Characteristics of Respondent

The characteristics of the respondents can be seen in **Table I**. Based on **Table I**, it can be explained that the majority of mothers are at a non-risk age of pregnancy (> 20 and < 35 years old) 78 mothers (77.2%). Forty-six mothers (45.5%) in the second trimester and 55 (54.4%) mothers had a reasonable pregnancy interval over two years. Parity data showed only one number difference: 35 mothers (34.7%) were nulliparous, and 34 mothers (33.7%) were primiparous.

Table I also showed that most mothers had a middle education (junior and senior high school), 56 mothers (55.4%). Eighty-seven mothers (86.1%) are housewives with a monthly family income of 89 mothers (88.1%) earning ≥ Provincial Minimum Wage (IDR 3,413,666). Meanwhile, the upper arm circumference data for 92 mothers (91.1%) was normal (≥23.5 cm), and 71 mothers (70.3%) had normal scores of Haemoglobin (Hb) ≥ 11 mg/dl. Still, data for 17 mothers (16.8%) were anemia (Hb < 11mg/dl); it should be a particular concern.

Prevalence of maternal nutritional knowledge: The majority, 57 (56.4%), had a good level of knowledge, 56 (55.4%) had normal PP-BMI (18.5-25.0), and 46 (45.5%) had normal MWG namely 46 (45.5%) with a

Table I: Characteristic Respondents (n=101)

Characteristics	f	%
Age		
Non-Risk Age	78	77.2
Risk Age	23	22.8
Gestation Age		
1 st Trimester	12	11.9
2 nd Trimester	46	45.5
3 th Trimester	43	42.6
Pregnancy interval		
1 st pregnancy	36	35.6
Good (≥ 2 years)	55	54.5
Short (< 2 years)	10	9.9
Parity		
Nulliparous	35	34.7
Primiparous	34	33.7
Multiparous	32	31.7
Education		
Elementary	18	17.8
Middle	56	55.4
High	27	26.7
Work status		
Housewife	87	86.1
Working	14	13.9
Household Salary		
≥ Provincial Minimum Wage	89	88.1
< Provincial Minimum Wage	12	11.9
Upper Arm Circumference		
Normal	92	91.1
Ab-Normal	9	8.9
Hemoglobin level		
No data	13	12.9
Normal	71	70.3
Anemia	17	16.8

Table II: Prevalence of Nutritional Knowledge, PP-BMI, and MWG of the respondent (n=101)

Variables	f	%
Knowledge		
Good	57	56.4
Enough	20	19.8
Poor	24	23.8
PP-BMI		
Underweight	8	7.9
Normal	56	55.4
Overweight	27	26.7
Obesity	10	9.9
MWG		
Normal	46	45.5
Not enough	20	19.8
Overweight	33	32.7
Stay/same with the PP-BMI	2	2.0

weight gain of 0.4 Kg/week for mothers with normal BMI (18.5-25.0), an increase of 0.5 Kg/week for thin BMI (<18.5), and a rise of 0.3 Kg/week for mothers with an overweight BMI (23-29.9) **Table II.**

Table III shows that the chi-square test between knowledge and PP-BMI showed a significant association ($p=.000$), $\alpha=0.05$. The opposite result showed no significant association between knowledge and MWG ($p=.710$), with $\alpha=0.05$.

Table III: Association between Nutritional Knowledge, PP-BMI, and MWG (n=101)

Variables	Nutritional Knowledge								p-value
	Poor		Enough		Good		Total		
	f	%	f	%	f	%	f	%	
PP-BMI									
Underweight	5	5.0	3	3.0	0	0.0	8	7.9	0.000
Normal	4	4.0	7	6.9	45	44.6	56	55.4	
Overweight	7	6.9	8	7.9	12	11.9	27	26.7	
Obesity	8	7.9	2	2.0	0	0.0	10	9.9	
MWG									
Normal	11	10.9	9	8.9	26	25.7	46	45.5	0.710
Low	7	6.9	3	3.0	10	9.9	20	19.8	
Overweight	6	5.9	8	7.9	19	18.1	33	32.6	
Not Increase	0	0.0	0	0.0	2	2.0	2	1.9	

DISCUSSION

This study's results show a significant association between maternal knowledge about nutrition and PP-BMI. Knowledge and maternal nutritional status are crucial, as they significantly impact the health and well-being of both mothers and their fetus. Maternal nutritional status refers to the health and dietary adequacy of a pregnant woman, while knowledge in this context relates to the understanding and awareness of proper nutrition and its importance during pregnancy⁷.

The proper weight gain during pregnancy varies for each pregnant woman. It depends on factors such as BMI, nutritional intake and growth of the fetus, placenta, and number of amniotic fluid⁷. There is a correlation between maternal anthropometry, body composition, weight gain during pregnancy, and food intake with low birth weight (LBW, <2.5 Kg). About a third of the women were short (<150 cm), 35% were underweight (<45 Kg), 23% suffered from chronic energy deficiency (CED, BMI < 18.5 Kg/m²), and 30% were overweight²⁰.

This study also showed no correlation between pregnant women's knowledge and MWG during Pregnancy ($p=.710$). PP-BMI is a vital indicator influencing the mother's nutritional status during pregnancy⁸. Ideally, mothers who have a normal PP-BMI will experience an increase in body weight during

pregnancy within the normal range²¹. However, this does not always occur within normal limits, so Maternal Weight Gain during Pregnancy is still outside the normal limits for weight gain, and two mothers (1,9%) in this study did not increase all their body weight.

Based on the result of this study, it can be inferred that their attitudes and behavior could influence their mothers' high level of knowledge. This research also showed that the increase in body weight of pregnant women is that 57% of pregnant women have good knowledge regarding nutrition during pregnancy. So, it could be concluded that knowledge is a factor that influences behavior. The level of knowledge about nutrition during pregnancy played an important role; based on research conducted in Turkey in 2015 involving 409 pregnant women, the result of nutritional knowledge for pregnant women was 69.10 ± 14.37 . The level of knowledge of pregnant women with primary school education is lower than the nutritional knowledge of pregnant women with secondary education and above²².

BMI of pregnant women is categorized as underweight if the BMI value is <18.5 Kg/m², so it is recommended to increase body weight by 0.51 kg every week, with normal BMI is 18.5 – 24.9, fat is 25 – 29.9 kg/m² and obesity >30 kg/m²¹⁸. Research conducted in Bangladesh in 2017, from 6584 women who had given birth in the last five years, with an average age of 25.65 years, who had an average BMI of 21.67 kg/m², found that 47% of mothers experienced pregnancy complications, weight 20% had low birth weight babies, 37% had stunted children and 14.4% experienced wasting, miscarriage (16%)²³. This research also states that a pregnant mother's BMI <18.5 has a stunted child with an odds ratio (CI 95%)²³. Another study conducted in Australia found a correlation between initial BMI and estimated weight gain during pregnancy. Pregnant women who were overweight or obese had a more significant tendency to have a BMI. The proportion of women who exceed the amount of weight they should gain during pregnancy is 73.5% overweight and 85.8% obese²⁴.

According to pregnant women's needs, nutrition proportions can be arranged to meet various types of macro and micronutrients by the recommendations of the Indonesia Ministry of Health for "the proportion of the contents of my plate" (*isi piringku*)²⁵. At least one meal menu must contain a source of carbohydrates, protein, vitamins, minerals, iron, and folic acid under the recommendations of the Ministry of Health for the proportion of the contents of my plate, the recommended food consumption for mothers at each meal is that half the contents of my plate are staple foods and side dishes. The portion of staple foods is slightly more than the portion of side dishes, half of my plate is fruit and vegetables, the portion of vegetables is more than the portion of fruit, the portion of sugar, salt, and fat in a day is no more than four tablespoons

(50 grams), one teaspoon of salt (5 grams), and five tablespoons of fat (70 grams)²⁶.

Adequate nutrition for pregnant women will affect the health status of the mother and fetus and the child's health in the future. So nutrition in the first 8.000 days of life is essential²⁷. The first 8.000 days of life program is one step to decreasing stunting cases. This program begins from conception until the individual is 19 years²⁸. So, the fulfilment of maternal nutrition during pregnancy is the main factor. PP-BMI and MWG status is crucial to prevent disruption to the mother and fetus's nutritional fulfilment and stunting²⁹. However, BMI before Pregnancy can be a significant factor, and an ideal diet pattern is the most important. Doing pregnancy exercises can help pregnant women gain weight in a normal condition.

CONCLUSION

Based on the results of this study, it is proven that there was a significant association between knowledge and maternal PP-BMI but not with MWG. Nutrition knowledge is essential. The better understanding pregnant women possess must be accompanied by increased good nutritional status. Even though PP-BMI is essential for Maternal Weight Gain during Pregnancy, controlling nutritional intake to avoid excess and underweight depends on the mother's knowledge, willingness, and behavior in managing an appropriate diet pattern. This study recommends that all health workers, especially community health centre officers, further promote health education to increase knowledge and optimal nutritional status of pregnant women.

ACKNOWLEDGEMENT

Thank you to all parties involved in this research. Aceh Besar Regency Health Service, Community Health Center in the Aceh Besar area, along with health workers in the Maternal and Child Health room of the Working Area Health Center of Aceh Besar Regency

Ethical permission: Universitas Syiah Kuala, Indonesia, ERC letter No. 113022060623.

Conflict of Interest: The authors declare no competing interest in the research.

Financial Disclosure / Grant Approval: This research was a grant funded by LPPM Universitas Syiah Kuala (Number: 399/UN11.2.1/PT.01.03/PNBP/2023)

Data Sharing Statement: The corresponding author can provide the data proving the findings of this study on request. Privacy or ethical restrictions bound us from sharing the data publically.

AUTHOR CONTRIBUTION

Rizkia M: Coordinated the entire research process and article preparation.

Fajri N: Data processing and data analysis

Halifah E: Data collection

Ardhia D: Data collection

Darmawati: Reviewed concept and edited the article

Kiftia M: Writing and compilation of the article

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