





Original Article

The Effectiveness Of A Nutritional Education-Based Module For Pregnant Women In Preventing Stunting

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ARTICLE INFO	ABSTRACT
<p>Article History Submit : Dec 6, 2023 Revised : Dec 24, 2023 Accepted : Dec 27, 2023</p> <p>Keywords: Education Module, Nutrition, Pregnant Women, Stunting.</p>	<p>Background: Maternal intake, especially during pregnancy, is one factor that plays an important role. Improvement of nutrition and health of pregnant women is closely related to the level of education, knowledge, and attitudes in meeting nutritional needs during pregnancy.</p> <p><i>Explain the Effectiveness of the Module for Pregnant Women based on Nutrition education, Nutritional Status, Knowledge, and attitudes of Pregnant Women in efforts to prevent stunting.</i></p> <p>Methods: The research design is pre-experimental with one group pre-test and post-test. They are held at one of the Puskesmas in Palembang from June to September 2023. Sampel is pregnant women with inclusion criteria, measuring nutritional status, knowledge, and attitudes of pregnant women before and after intervention with the Pregnant Women Module. Probability sampling variables and research variables of knowledge level, attitude, and nutritional status. The instruments used are questionnaires, and data are analysed with t-test statistics.</p> <p>Results: Based on the T-test, there was a significant influence on respondents' level of knowledge and attitudes after being given treatment. The t-test (2-tail) result > 0.05 showed no significant difference between initial and late nutritional status based on HB measurements. This showed no significant effect of treatment with the module of pregnant women on nutritional status. While nutritional status is based on LILA measurements, The T-test results have a significance value (2-tail) < 0.05. This shows that there is a significant effect of intervention on nutritional status after being given treatment</p> <p>Conclusion: The nutrition education-based module for pregnant women has a significant effect on the level of knowledge and attitudes of respondents. There was an increase in knowledge, attitudes, and nutritional status of respondents after nutrition education. It is hoped that pregnant women, after nutrition education, can understand more about Balanced Nutrition and stunting prevention during pregnancy and after childbirth. They are processing the daily food menu with healthy and nutritious food ingredients so that chronic lack of energy and anaemia do not occur during pregnancy.</p>

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Introduction

Stunting is one of the problems that hinder human development globally. The adverse effects that can be caused by nutritional problems (*stunting*) in the short term are disruption of intelligence and brain development, impaired physical growth, and metabolic disorders in the body. In the long run, the adverse consequences that can be caused are decreased cognitive ability and learning achievement, decreased immunity so that it is easy to get sick, and a high risk for the emergence of diabetes, obesity, heart, and blood vessel disease, cancer, stroke, and disability in old age, as well as uncompetitive work quality which results in low economic productivity (Ministry of Health RI, 2016). The results showed that *stunting* was influenced by family income factors, maternal nutritional knowledge, maternal parenting, history of disease infection, immunisation history, protein intake, and maternal intake. Maternal intake, especially during pregnancy, is one factor that plays an important role. Improvement of nutrition and health of pregnant women is closely related to the level of education, knowledge, and attitudes in meeting nutritional needs during pregnancy. Inadequate knowledge and improper practices are obstacles to improved nutrition. Generally, people do not realise the importance of nutrition during pregnancy and the first two years of life. Women often need to realise the importance of their nutrition ([Ekayanthi & Suryani, 2019](#))

Lack of awareness about the importance of maternal nutrition will impact the lack of efforts made to prevent stunting. This condition will, of course, continue until the child is born and grows. In its development, children who are short in stature are considered normal and have no impact on their further development, so

they do not require special treatment (LIPI, 2019) ([Sriwiyanti & Detiana, 2021](#)). Improvement efforts needed to overcome stunting include preventing and reducing direct disturbances (specific nutrition interventions).

Specific nutritional intervention efforts are focused on the First 1,000 Days of Life (HPK) group, namely pregnant women, breastfeeding mothers, and children 0-23 months because the most effective prevention of stunting is carried out in the 1,000 HPK (golden period or critical period/windows of opportunity) Indonesian Ministry of (Health Data and Information Center, 2016) in ([Ekayanthi & Suryani, 2019](#)). The mother's nutritional status during and before pregnancy can influence the development of the fetus being conceived. If the mother's nutritional status is expected before and during pregnancy, she will likely give birth to a healthy baby. , full term with average weight. In other words, the quality of the baby is very dependent on the mother's nutritional status before and during pregnancy ([Rahmadhani et al., 2013](#)). Increasing respondents' knowledge about nutrition education can be done by conveying information, as in ([Notoatmodjo, 2014](#)). Information delivery is influenced by the methods and media used, where the methods and media for delivering information can have a significant effect. According to ([Johariyah Mariati, 2018](#)), changes in respondents' knowledge before and after providing adolescent reproductive health counselling regarding adolescent reproductive health by providing modules changed for the better and increased adolescent knowledge. Modules are printed teaching materials designed to be studied independently by learning participants ([Johariyah & Mariati, 2018](#)).

Puskesmas Sebelas Ilir has the highest number of stunting toddlers, namely 70 stunting toddlers consisting of 34 stunting male toddlers and 36 *stunting* female toddlers, with a total of 25-59 months old toddlers, as many as 214 toddlers (2017 Weighing Operation Results Report). Health promotion through nutrition education affects the increase in maternal knowledge; the expected result of nutrition education is an increase in knowledge and attitudes and the ultimate goal of achieving changes in individual, family, and community behaviour to prevent *stunting*. Modules are printed teaching materials designed to be studied independently by learning participants ([Johariyah & Mariati, 2018](#)).

By taking into account the background of the above problem, the researcher is interested in producing a product in the form of a nutrition education-based Pregnant Women module which will measure its effectiveness on nutritional status, knowledge, and attitudes of mothers in efforts to prevent *stunting* in the Sebelas Ilir Palembang Health Center Work area.. Produce a product Module for Pregnant Women based on Nutrition education. Explain the Effectiveness of the Module for Pregnant Women on Nutritional Status, Knowledge, and Nutrition of Pregnant Women to prevent *stunting*.

Methods

The study used a pre-experimental design. This research is quasi-experimental with a *one-group pretest-posttest design*, starting with measuring the nutritional status of pregnant women with blood LILA and Haemoglobin (HB) measurements and conducting a pre-test of respondents' knowledge and attitudes towards nutrition and *stunting* knowledge in the first month of research. She then continued education using the media module for pregnant women based on nutrition education. In the

second month, a demonstration was carried out on the presentation of fresh food ingredients and menus per the Guidelines for Balanced Nutrition and Daily Value (RDA) of pregnant women. This method is expected to increase mothers' knowledge of determining attitudes in choosing good food ingredients. The final research activity was data collection after education with module media. She measured pregnant women's knowledge and attitudes after intervention with media. The research team made the module to prevent *stunting* in the work area of Puskesmas Sebelas Ilir Palembang.

The population is all pregnant women who are in the working area of the Puskesmas Sebelas Ilir Palembang. Samples taken with *probability sampling* techniques provide equal opportunities for every member of the population. This research has Ethicale Clearance. While the accuracy or confidence level is 95%, the smaller the error rate, the greater the number of samples, meaning the more representative the population. The sample is pregnant women with the inclusion criteria:

- 1). Pregnant women who check themselves at Puskesmas 11 ilir
- 2). Pregnant Women who are physically and spiritually healthy
- 3). Pregnant women can read and write
- 4). Willing to be a respondent

Exclusion Criteria :

- 1) Pregnant women who do not check themselves at Puskesmas 11 ilir
- 2) Pain during Pregnancy
- 3) Not willing to be a respondent

The research was located in the working area of the Sebelas Ilir Palembang Health Center. The research period was conducted from June to September 2023. Primary data taken are pregnant women's characteristics, including the respondents' age, gestational age, education level,

occupation, and husband's occupation. The secondary data are pre-and post-test data on knowledge and attitudes—initial nutritional status data based on Lila and HB measurements and nutritional status data after nutrition education. Univariate analysis was used to see the picture and frequency distribution of the characteristics of research respondents. The frequency distribution table is analysed descriptively. Bivariate analysis aims to determine the influence of module media on changes in nutritional status, level of knowledge, and psychological health before and after nutrition education. Data is analysed with the T-Test.

Results

Table 1. Distribution Characteristics of Respondents

No.	Variable	Frequency (n)	Percentage (%)
1. Gestational Age			
	1st Trimester	3	10
	Second Trimester	17	56,7
	Third Trimester	10	33,3
3. Age of Respondents			
	≥ 20 years	3	10
	21 - 30 years	21	70
	31 - 40 years	6	20
4. Education Level			
	SD	3	10
	JUNIOR	9	30
	SMA	12	40
	Bachelor	6	20
5. Respondent's Occupation			
	Household Friendly Mom	25	83,4
	Private	2	6,6
	Civil servants	3	10

No.	Variable	Frequency (n)	Percentage (%)
6. Occupation Husband of the respondent			
	Labourer	21	70
	Private	7	23,3
	Civil servants	2	6,7

It is known that the gestational age of the respondents is average in the second Trimester: 56.7%, as many as 17 people, in the third trimester; 33.3% in the First trimester, 10 %. The education level is at most 40% high school compared to undergraduate 20%, junior high school 30%, and elementary school 10%. Occupation Respondents are mostly housewives; 83.4% followed by private workers 6.6% and civil servants 10%. The respondent's husbands mainly worked in labour, 70%, followed by private work, 23.3%, and civil servants, 6.7%. The respondents were mainly at the age of 21-30 years 70%, followed by the age of 31-40 years 20% and the age of ≥ 20 years 10%. According to Alza, 2016, the age of 21-30 is a productive age that can capture the information given, and remember that mothers with organ maturity can think well. The mother's age can determine maternal health related to the pregnancy condition.

Table 1. Distribution of Respondents' Knowledge Levels

No.	Level of knowledge	Before		After	
		n	%	n	%
1.	Good	0	0	12	40
2.	Enough	17	56,7	14	46,6
3.	Less	13	43,3	4	13,4

The table shows an increase in respondents' knowledge; before the



intervention, the level of knowledge was good at 0%; after the intervention using the nutrition education-based module for pregnant women, it increased to 40%.

The increase in knowledge in the excellent category increased after nutrition education was carried out using module media; this statement is in line with Musdhalifah's research in 2020 titled Development of stunting risk detection modules on the knowledge of pregnant women, which turns on that the modules developed can increase the knowledge of pregnant women, with the Wilcoxon test showing an increase in knowledge after being given intervention. Modules are teaching materials packaged attractively and systematically that contain planned learning experiences and are designed to achieve specific learning goals, Daryanto, 2013 in Musdhalifah, 2020.

Statistical results show a significance value (2 -tail) < 0.05 (0,000) indicating a significant difference between pre-test and post-test. This shows a significant influence on the difference in treatment given. This means that after treatment with the nutrition education-based module, pregnant women significantly influence the results of the post-test knowledge about nutrition.

Table 2. Distribution of Respondents' Attitudes

No.	Level of knowledge	Before		After	
		n	%	n	%
1.	Good	10	33,4	19	63,3
2.	Enough	18	60	11	36,7
3.	Less	2	6,6	0	0

The table shows that there was an increase in respondents' attitudes before the intervention attitude with a suitable category of 33.4%; after intervention using

the module of pregnant women based on nutrition education, attitudes with a good category increased to 63.3%

The results of the Statistical Test show a significance value (2 -tail) < 0.05 (0.000). There is a significant difference between pre-test and post-test. This means there is a significant influence on respondents' attitudes after intervention with the nutrition education-based module for pregnant women. Alza, 2016 supports the results of this study. The results show that the use of modules can affect changes in respondents' attitudes after nutrition education. . research by Jumiati 2014 states that there is an average increase in cadre attitudes in efforts to provide exclusive breastfeeding in both groups.

Attitude is a predisposition to respond to environmental stimuli that can initiate or guide the person's behaviour. Definitively, attitude means a state of mind and a state of thought that is prepared to respond to an object organised through experience and directly or indirectly affect practice or action (Notoatmodjo, 2012). The positive impact of learning is a change in the affective realm to create awareness and increase positive attitudes toward what is taught. Research by Jumiati, 2014 states that there is an average increase in cadre attitudes in efforts to provide exclusive breastfeeding in both groups.

Table 3. Distribution of Respondents' Nutritional Status based on LILA measurements

No.	Nutritional Status	Before		After	
		n	%	n	%
1.	KEK : ≥ 23.5 cm	23	76,7	6	20
2.	Normal : < 23 cm	7	23,3	24	80

Nutritional Status based on Lila's measurements before the intervention

obtained Chronic lack Of Energi (KEK) respondents 76.7%, average 23%. After education was carried out with the nutrition education-based pregnant women module, data was obtained that KEK respondents dropped to 20% and regular participants increased to 80%.

The table shows that Nutritional status is based on LILA measurements; the T-test results have a significance value (2-tail) < 0.05 (0.012). This shows that intervention significantly affects nutritional status after being given treatment.

Table 4. Distribution of Respondents' Nutritional Status based on HB measurement

No.	Nutritional Status	Before		After	
		n	%	n	%
1.	Normal : ≥ 11 mmHg	15	50	17	57
2.	Mild anemia: 10 - 10.9 mmHg	10	33,3	8	27
3.	Moderate anemia: 7 - 9.9 mmHg	5	16,7	5	16

Meanwhile, based on the initial HB measurement, the following data were obtained: Normal 50%, mild anaemia at 33.3%, and moderate anaemia at 16.75. After an educational intervention with the media module, the Status of mild anaemia dropped to 27%, severe anaemia dropped to 16%, and Normal increased to 57%.

The table shows a significance value (2-tail) > 0.05 (0.071), meaning no significant difference exists between initial and final nutritional status based on HB measurements. This shows no significant

effect after treatment with the nutrition education-based pregnant mother module.

Discussion

It is known that the average gestational age of respondents is in the second trimester: 56.7%, as many as 17 people, Trimester III; 33.3%, Trimester I; 10 %. The highest level of education is high school, 40%, compared to 20% bachelor's degree, 30% middle school, and 10% elementary school. Respondents' occupations were mostly homemakers; 83.4% followed by private sector workers 6.6% and civil servants 10%. Most respondents' husbands were workers at 70%, followed by private jobs at 23.3% and civil servants at 6.7%. Most respondents were aged 21 -30 years 70%, followed by those aged 31 - 40 years 20% and aged ≥ 20 years 10%. According to Alza, 2016 Age 21 -30 years is a productive age that can capture the information given and can recall it; mothers with mature organs can think well. Maternal age can determine maternal health related to pregnancy conditions.

Mothers under twenty years of age are immature and not ready physically and socially to face pregnancy, labour, and delivery, as well as to care for the baby being born.

The levels of education are secondary and higher education, which means it is easy for mothers to capture the information provided and be able to recall it. The job characteristics of mothers, most of whom are housewives, namely 79.6%, are very supportive in providing time to re-read the educational material provided



(Ramlah S, 2014 in Alza, 2016). The job of the respondent's husband in this study was dominated by work as a labourer. The working area of the Sebalas ILir Public Health Center in Palembang is mainly a market and shop area, so many men work as labourers in the market. According to Ichsan, 2021, most people carry out this work, especially those with a weak economy and low education, as the primary job they undertake, so dependence on income from work greatly influences their consumption. This study showed that the nutritional status of pregnant women with KEK was 76.7%, and moderate anaemia was 16.7%, according to Ekowati, 2007. Economic problems are the main problem for families, so they cannot meet their nutritional needs. Some families expressed that their income would not be enough to buy nutritious food daily, such as meat, eggs, milk, and chicken, because they thought the price was expensive and unaffordable for the family's finances.

The module created for pregnant women aims to increase the knowledge and attitudes of pregnant women regarding the meaning of health and nutritional status of pregnant women, nutritional needs of pregnant women, nutritious food ingredients for pregnant women, stunting, and preventing stunted births (Ashari, 2021; Diana & Veronica, 2022).

Module material was obtained from various literature reviews guided by the module's objectives and contents (Lee et al., 2023; Omer et al., 2020). The modules in this research are made with exciting material and pictures so that mothers will not get

bored of opening and repeating reading them. Modules are printed teaching materials designed to be studied independently by learning participants.

Knowledge results from knowing and occurs after someone senses an object. Sensing occurs through the five human senses, namely, the senses of hearing, sight, smell, feeling, and touch. Some human knowledge is obtained through the eyes and ears (Putri et al., 2020). The influence of the module on the level of knowledge of respondents in this study. Knowledge in the excellent category increased after nutrition education was carried out using the module media (Connor et al., 2018; Edwards et al., 2021).

The statistical test results show a significance value (2 - tail) < 0.05. This shows a significant influence on the differences in treatment given. This means that treatment with the nutrition education-based module for pregnant women significantly influences the knowledge post-test results.

Meanwhile, the influence of the module on respondents' attitudes Attitude is a predisposition to respond to environmental stimuli that can initiate or guide the person's behaviour. By definition, attitude means a state of mind and a state of thinking prepared to respond to an object organised through experience and influences directly or indirectly on practice or action.

The influence of the module on changes in the attitudes of pregnant women can be proven statistically as follows. The T-test results show a significance value (2-tail) < 0.05. Shows that there is a significant

difference between the pre-test and post-test. This means that there is a significant influence on the attitudes of pregnant women after education with nutritional education-based training for pregnant women. The positive impact of learning is the occurrence of changes in the affective domain so that awareness is created and positive attitudes towards what is taught increase. In this research, education using a module for pregnant women based on nutrition education can improve attitudes in the excellent category. This can be seen from the increase in the post-test results of pregnant women's attitudes. This is in line with Jumiati's research, 2014, which stated that there was an average increase in cadres' attitudes towards providing exclusive breastfeeding in both groups.

From the research results, the Pregnant Mother Module based on nutrition education significantly influenced changes in the nutritional status of respondents after intervention based on LILA measurements. It did not significantly influence changes in the nutritional status of respondents based on HB measurements.

During pregnancy, iron deficiency often occurs in the body. Iron is a mineral needed to form red blood cells (haemoglobin). Apart from that, this mineral also acts as a component to form myoglobin (a protein that carries oxygen to muscles), collagen (a protein found in bones, cartilage, and connective tissue), and iron enzymes, which also function in the body's defence system.

Nutritional status is essential to determine whether a pregnant mother can go through her pregnancy well and

without any problems. The nutritional status of pregnant women must be expected because when pregnant women experience malnutrition or excess nutrition, there will be many complications that may occur during pregnancy and have an impact on the health of the fetus they are carrying. One of the nutritional problems of pregnant women is chronic energy deficiency.

Changes in nutritional status in this study were caused by the effect of education provided to respondents who used the media module for pregnant women based on nutrition education. which states that the levels of Haemoglobin of adolescent girls have increased as an effect of providing nutrition education provided by teachers using modules.

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Conclusion

The module for pregnant women based on nutrition education affects the nutritional status, level of knowledge, and respondents' attitudes.

Respondents' nutritional status, knowledge, and attitudes increased after nutrition education. It is hoped that pregnant women, after nutrition education, can understand more about Balanced Nutrition and stunting prevention during pregnancy and after childbirth.

They prepare a daily menu with healthy and nutritious ingredients so that Chronic of Lack Energy (KEK) and anaemia do not occur during pregnancy.

Authors Contributions

The author carries out tasks from data collection, data analysis, and discussions to making manuscripts

Conflicts of Interest

There is no conflict of interest.

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