

EFFECTIVENESS OF NUTRITION EDUCATION FOR PREGNANT WOMEN IN IMPROVING NUTRITIONAL STATUS

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ABSTRACT

Pregnancy is a critical period requiring special attention to nutritional needs. Chronic Energy Deficiency (CED) and anemia in pregnant women remain serious problems in Indonesia with a CED prevalence of 16.9% and anemia of 48.9%. Tulungagung Regency faces serious challenges with anemia (6.5%) and CED (6.3%) contributing to stunting. Tanjungsari Village, Boyolangu District, is one of the villages focused on the "Desa Cantik" program development, yet specific data on the nutritional status of pregnant women remains limited. This study aimed to determine the effectiveness of nutrition education in improving the nutritional status of pregnant women in Tanjungsari Village. This study employed a quasi-experimental design with a one-group pre-test post-test approach. The sample comprised 30 pregnant women in Tanjungsari Village selected through purposive sampling. The intervention involved nutrition education over 4 weeks (4 sessions) using lectures, discussions, audiovisual media, and guidebooks. Measurements were conducted before (pre-test) and after (post-test) the intervention, including knowledge, attitudes, nutritional practices, and nutritional status (MUAC, body weight, and hemoglobin levels). Data analysis used the Wilcoxon Signed-Rank Test, Paired T-test, and McNemar test with a significance level of $\alpha=0.05$. There were significant improvements in nutritional knowledge (mean 62.4 $\rightarrow$ 86.7; $p=0.00$), attitudes (mean 45.8 $\rightarrow$ 62.5; $p=0.001$), and practices (mean 57.8 $\rightarrow$ 78.3; $p=0.000$). Nutritional status also showed significant improvements: MUAC (23.1 cm $\rightarrow$ 23.8 cm; $p=0.002$), body weight (54.2 kg $\rightarrow$ 56.8 kg; $p=0.001$), and hemoglobin levels (10.8 g/dL $\rightarrow$ 11.8 g/dL; $p=0.000$). The prevalence of CED risk decreased from 30.0% to 16.7%, and the prevalence of anemia decreased from 46.7% to 26.7%. Nutrition education is effective in improving knowledge, attitudes, nutritional practices, and nutritional status (MUAC, body weight, and hemoglobin levels) among pregnant women in Tanjungsari Village. Repeated and continuous educational interventions with a combination of methods have proven effective as a prevention strategy for CED and anemia in pregnant women in rural areas.

Keywords : Anemia, Attitudes, CED, Knowledge, Nutrition Education, Pregnant Women, Nutritional Status, Practices

1. INTRODUCTION

Pregnancy is a critical period that requires special attention to meeting nutritional needs. The nutritional status of pregnant women not only impacts the health of the mother, but also affects the growth and development of the fetus, the childbirth process, and the quality of life of the child in the future (Khairani & Nuraeni, 2025). Chronic Energy Deficiency (SEZ) and anemia in pregnant women are serious problems that contribute to the high Maternal Mortality Rate (AKI) and Infant Mortality Rate (AKB) in Indonesia (Ningtiyasari, 2016; Sofiyah, 2025).

Based on data from the 2018 Basic Health Research (Riskesdas), the prevalence of SEZ in pregnant women in Indonesia reached 17.3%. Although it has decreased to 16.9% in 2023, this figure is still above the national target of 10% (Ministry of Health of the Republic of Indonesia, 2023). The prevalence of anemia in pregnant women is also still worrying, reaching 48.9% nationally and 58.3% in several districts (Riskesdas, 2018; Ningtiyasari, 2016).

Tulungagung Regency, East Java, faces serious challenges related to the nutritional problems of pregnant women. Based on data from the Tulungagung Regency Health Office (2024), the stunting rate in this district reaches 3.9% or more than 2,000 children. Pregnant women with anemia contributed to stunting by 6.5%, while pregnant women with SEZ accounted for 6.3%. Research in Bandung District, Tulungagung Regency shows that Upper Arm Circumference (LiLA) <23.5 cm and anemia in the third trimester are the strongest risk factors for the occurrence of Low Birth Weight (BBLR) (Sentha, 2020).

Tanjungsari Village, Boyolangu District, Tulungagung Regency, is one of the

villages that is the focus of coaching to improve the quality of population data and information through the Beautiful Village (Cinta Statistik) program (BPS Tulungagung Regency, 2024a, 2024b). However, specific data on the nutritional status of pregnant women in Tanjungsari Village is still limited. Based on this condition, interventions are needed to improve the knowledge and nutritional status of pregnant women through targeted nutrition education

Various studies show that nutrition education is effective in improving the nutritional knowledge of pregnant women. The use of audiovisual media at the Kranggan Health Center showed an increase in knowledge scores from an average of 59.40 to 98 ($p=0.000$) (Sofiyah, 2025). The use of guidebooks has also been shown to be effective in increasing pregnant women's understanding of the importance of nutritional status (Khairani & Nuraeni, 2025). However, a study in North Bonde Village showed that one-time education has not been able to significantly increase knowledge ($p=0.7751$), so a more interactive and sustainable approach is needed (Sahrir et al., 2026).

Based on the description above, this study aims to determine the effectiveness of providing nutrition education to pregnant women in improving nutritional status in Tanjungsari Village, Boyolangu District, Tulungagung Regency. The novelty of this study lies in the use of a combination of educational methods (lectures, discussions, audiovisual media, and guidebooks) that are carried out repeatedly (4 sessions) in the population of pregnant women in rural areas that have not been widely reached by structured nutrition intervention programs

2. METHODS

The research design used a quasi-experimental design with a one-group pre-

test post-test design approach. The research sample was 30 pregnant women in Tanjungsari Village who were selected using the purposive sampling technique. The intervention was in the form of providing nutrition education for 4 weeks (4 sessions) with lectures, discussions, audiovisual media, and guidebook methods. Measurements were taken before and after the intervention including knowledge, attitudes, nutritional practices, and nutritional status (LiLA, body weight, and hemoglobin levels). Data analysis used the Wilcoxon Signed-Rank Test, Paired T-test, and McNemar test with a significance level of $\alpha=0.05$.

3. RESULTS

General Data

1. Respondent Characteristics

This study involved 30 pregnant women in Tanjungsari Village, Boyolangu District, Tulungagung Regency who met the inclusion criteria. All respondents (100%) completed the entire series of research (pretest, 4 educational sessions, and posttest) without dropping out. The characteristics of the respondents are presented in Table 1.

Table 1. Distribution of Research

Respondent Characteristics Features	Category	Frequency (n)	Percentage (%)
Age	<20 years old	5	16,7
	20-35 years old	22	73,3
	>35 years old	3	10,0
Education	Elementary / Equivalent	2	6,7
	Junior High School / Equivalent	14	46,7
	High School / Equivalent	12	40,0
	College	2	6,7
	Work	7	23,3
Jobs	Not Working	23	76,7
	Primipara (1)	13	43,3
Paritas	Multipara (≥ 2)	17	56,7
	Trimester I	8	26,7
Trimester	Trimester II	14	46,7
	Trimester III	8	26,7

Based on Table 1, most of the respondents were in the healthy reproductive age group of 20-35 years (73.3%). The respondents' education level was dominated by junior high school (46.7%) and high school (40.0%) education. Most of the respondents were not employed (76.7%), and the majority were multi-parent mothers (56.7%). The distribution of the first trimester of pregnancy showed that most of the respondents were in the second trimester (46.7%).

SPECIAL DATA

1.Initial Nutritional Status of Respondents

Data on the initial nutritional status of respondents before the educational intervention are presented in Table 2.

Tabel 2. Distribusi Status Gizi Awal Responden

Indikator	Category	Frequency (n)	Prevalence (%)	Mean $\pm$ SD
Purpale	SEZ Risk (<23.5cm)	9	30,0	23,1 $\pm$ 1,2
	SEZ Risk ($\geq$ 23.5cm)	21	70,0	
Up to Hb	Anemia (<11 g/dl)	14	46,7	10,8 $\pm$ 1,3
	Tidak anemia ($\geq$ 11 d/dl)	16	53,3	
IMT	Kurus (18.5<)	4	13,3	23,2 $\pm$ 3,1
	Normal (18,5-24,9)	18	60,0	
	Fat (25.0-29.9)	6	20,0	
	Obesity ($\geq$ 30)	2	6,7	

Based on Table 2, it is known that 30% of respondents are at risk of Chronic Energy Deficiency (SEZ) with a LiLA of <23.5 cm. The prevalence of anemia in respondents reached 46.7% with an average hemoglobin level of 10.8 g/dL. Body Mass Index (BMI) status showed that most respondents had normal BMI (60.0%).

1.The Effectiveness of Education on Nutrition Knowledge

The results of the analysis of differences in nutritional knowledge scores of pregnant women before and after the provision of nutrition education are presented in Table 3

Knowledge Level	Pre-test n	Pre-test %	Post-test n	Post-test %
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Less (score <56%)	6	20,0	0	0
Adequate (score 56-75%)	19	63,3	5	16,7
Good (score 76-100%)	5	16,7	25	83,3
Total	30	100	30	100

Based on Table 3, there was a significant increase in the level of nutrition knowledge of respondents after being educated. In the pre-test, only 16.7% of respondents had good knowledge, while after the intervention (post-test), as many as 83.3% of respondents were in the category of good knowledge. Respondents with less knowledge decreased from 20.0% to 0%.

Table 4. Results of Knowledge Score Differential Test Before and After Education

Groups	N	Mean	SD	Min	Max	p-value
Pre-test	30	62,4	8,7	45	78	0,000
Post-test	30	86,7	6,5	72	98	

Remarks: Wilcoxon Signed-Rank Test, significant at $p < 0.05$

The results of the statistical test in Table 4 show that there is a significant difference between the nutritional knowledge score before and after the provision of education ($p = 0.000$). The average knowledge score increased from 62.4 to 86.7 with an increase of 24.3 points.

2.The Effectiveness of Education on Nutrition Knowledge

The results of the analysis of differences in nutritional attitudes of pregnant women before and after the provision of nutrition education are presented in Table 5

Table 5. Distribution of Nutritional Attitudes Before and After Education

Pre-test	Post-test
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Nutritional Attitude	n	%	n	%
Negatives	12	40,0	2	6,7
Positive	18	60,0	28	93,3
Total	30	100	30	100

Based on Table 5, there was an increase in positive attitudes towards nutrition in respondents after being educated. In the pre-test, 60.0% of respondents had a positive attitude, while after the intervention it increased to 93.3% of respondents had a positive attitude

Table 6. Results of Attitude Score Differences Before and After Education

Groups	N	Mean	SD	Min	Max	p-value
Pre-test	30	45,8	7,2	32	58	0,001
Post-test	30	62,5	6,1	50	75	

Remarks: Paired T-test, significant at $p < 0.05$
The results of the statistical test in Table 6 show that there is a significant difference between the nutritional attitude score before and after the provision of education ($p = 0.001$). The average attitude score increased from 45.8 to 62.5 with an increase of 16.7 points

3.The Effectiveness of Education on Nutrition Practices

The results of the analysis of differences in nutritional practices of pregnant women before and after the provision of nutrition education are presented in Table 7

Table 7. Distribution of Nutrition Practices Before and After Education

Gzi Practice	Pre-test		Post-test	
	n	%	n	%
Less	8	26,7	1	3,3
Enough	16	53,3	8	26,7
Good	6	20	21	70,0
Total	30	100	30	100

Based on Table 7, there was a significant increase in nutrition practices in respondents after being educated. In the pre-test, only 20.0% of respondents had good nutrition practices, while after the intervention it increased to 70.0% of

respondents were in the category of good practices

Table 8. Results of Different Practice Scores Before and After Education

Groups	N	Mean	SD	Min	Max	p-value
Pre-test	30	57,8	8,9	40	75	0,000
Post-test	30	78,3	7,4	62	92	

Keterangan: Uji Wilcoxon Signed-Rank Test, signifikan pada $p < 0,05$

The results of the statistical test in Table 8 show that there is a significant difference between the scores of nutrition practice before and after education ($p = 0.000$). The average practice score increased from 57.8 to 78.3 with an increase of 20.5 points.

4.The Effectiveness of Education on Nutritional Status

1. Changes in Upper Arm Circumference (LiLA)

The results of the analysis of LiLA changes before and after the intervention are presented in Table 4.9

Table 9. Distribution of LiLA Status Before and After Education

Categor y LiLA	Pre-test		Post-test		Chang es (%)
	n	%	n	%	
Risks of SEZs	9	30,0	5	16,7	-13,3
No SEZs	2	70,0	2	83,3	+13,3
Total	3	100	3	100	
	0		0		

Based on Table 9, there was a decrease in the prevalence of SEZ risk in respondents after the intervention. In the pre-test, 30.0% of respondents had a LiLA of < 23.5 cm, while after the intervention it decreased to 16.7% of respondents who were still at risk of SEZ
Tabel 10. LiLA Differential Test Results Before and After Education

Groups	N	Mean	SD	Min	Max	p-value	n	%	n	%	(%)
Pre-test	30	23,1	1,2	20,5	25,0	0,002	Anemia	1	46,	8	26,
								4	7		7
							No	1	53,	2	73,
								6	3	2	3
Post-	30	23,8	1,1	21,5	26,0		Total	3	100	3	100
test								0		0	

Keterangan: Uji Paired T-test, signifikan pada $p < 0,05$

The results of the statistical test in Table 10 show that there is a significant difference between the average LiLA before and after education ($p = 0.002$). The average LiLA increased from 23.1 cm to 23.8 cm with an increase of 0.7 cm.

2. Weight Changes

The results of the analysis of weight changes before and after the intervention are presented in Table 11.

Table 11. Weight Difference Test Results Before and After Education

Groups	N	Mean (kg)	SD	Min	Max	p-value
Pre-test	30	54,2	6,8	42,0	68,0	0,001
Post-test	30	56,8	6,5	44,5	70,5	

Keterangan: Uji Paired T-test, signifikan pada $p < 0,05$

The results of the statistical test in Table 11 show that there is a significant difference significant difference between the average body weight before and after education ($p = 0.001$). The average body weight increased from 54.2 kg to 56.8 kg with an increase of 2.6 kg during the intervention period.

3. Changes in Hemoglobin Levels

The results of the analysis of changes in hemoglobin levels before and after the intervention are presented in Table 12

Table 12. Distribution of Anemia Status Before and After Education

Categor y LiLA	Pre-test	Post-test	Change s
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Based on Table 12, there was a decrease in the prevalence of anemia in respondents after the intervention. In the pre-test, 46.7% of respondents experienced anemia ($Hb < 11$ g/dL), while after the intervention it decreased to 26.7% of respondents who still had anemia.

Table 13. Results of Different Hemoglobin Levels Before and After Education

Groups	N	Mean (g/dl)	SD	Min	Max	p-value
Pre-test	30	10,8	1,3	8,5	12,8	0,000
Post-test	30	11,8	1,1	9,8	13,5	

Keterangan: Uji Paired T-test, signifikan pada $p < 0,05$

The results of the statistical test in Table 13 show that there is a significant difference between the average hemoglobin levels before and after the provision of education ($p = 0.000$). Average hemoglobin levels increased from 10.8 g/dL to 11.8 g/dL with an increase of 1.0 g/dL

4. DISCUSSION

1. The Effectiveness of Nutrition Education on Pregnant Women's Nutritional Knowledge

The results of the study show that the provision of nutrition education is effective in significantly improving the nutritional knowledge of pregnant women in Tanjungsari Village. The average knowledge score increased from 62.4 to 86.7 (an increase of 24.3 points, $p = 0.000$), with the proportion of well-informed

pregnant women increasing from 16.7% to 83.3%.

This finding is in line with Sofiyah's (2025) research at the Kranggan Health Center which showed an increase in the knowledge score from an average of 59.40 to 98 after intervention using audiovisual media with a value of $p=0.000$. This significant improvement shows that the educational method used in this study, which combines lectures, discussions, educational videos, and guidebooks, is effective in transferring nutritional knowledge to pregnant women.

Putri's (2022) research on 1st trimester pregnant women with hypertension also showed similar results, with the level of good knowledge increasing from 35% to 75% after education through animated video media, with a value of $p=0.000$. This indicates that audiovisual media as part of educational interventions has an important role in improving the understanding of pregnant women because of its attractive and easily digestible nature.

Dasmasela et al.'s (2026) study on 175 pregnant women in three districts/cities in Indonesia also reported a significant increase in knowledge scores from 66.17 to 72.40 ($\Delta +6.23$, $p<0.001$) after an educational intervention with the Behavior Change Communication (BCC) approach for 16 weeks. Although the improvement in this study was greater (24.3 points), this may be due to the shorter duration of the intervention (4 weeks) but more intensive and the characteristics of respondents who had lower initial knowledge scores (62.4) so there was greater room for improvement.

The research of Sahrir et al. (2026) showed different findings, where balanced nutrition education carried out once on 12 pregnant women of KEK in North Bonde Village was not able to significantly

increase knowledge ($p=0.7751$). In contrast to the study, the intervention in this study was carried out as many as 4 sessions for 4 weeks, which allowed reinforcement and repetition of the material. This confirms that the duration and frequency of education are important factors in the effectiveness of interventions, as recommended by Sahrir et al. (2026) that a more interactive educational approach, the use of audiovisual media, and the implementation of education in a repetitive and sustainable manner are needed in order to have a more optimal impact on improving the nutritional knowledge of pregnant women.

A literature review by Rania (2025) which analyzed 6 studies also concluded that nutrition education has an effect on changing the knowledge of pregnant women, with lectures, discussions, animated videos, and posters as effective media. These findings strengthen the results of research that the combination of various educational methods provides optimal results in improving the nutritional knowledge of pregnant women.

2. The Effectiveness of Nutrition Education on Nutritional Attitudes of Pregnant Women

The results showed a significant improvement in the nutritional attitudes of pregnant women after the intervention, with the average score increasing from 45.8 to 62.5 (an increase of 16.7 points, $p=0.001$). The proportion of pregnant women with a positive attitude increased from 60% to 93.3%. These findings are in line with the research of Dasmasela et al. (2026) who reported an increase in attitude scores from 49.83 to 55.60 ($\Delta +5.77$, $p<0.001$).

Improving a positive attitude towards nutrition is an important component of long-term behavior change. According to

the Health Belief Model framework, when individuals feel the benefits of a behavior, they tend to continue to do that positive behavior (Rosenstock et al., 1988). In this context, positive attitudes formed through education become the foundation for pregnant women to maintain healthy nutrition practices even after the intervention ends.

Rania (2025) in her literature review concluded that nutrition education has been proven to have an effect on changes in the attitude of pregnant women. Research at the Kebon Jeruk District Health Center also shows that after educational activities, almost all subjects have a positive attitude towards health and nutrition (Esa Unggul University, 2022). This shows that education that is well designed and delivered interactively is able to change the perception and attitude of pregnant women to be more positive about the importance of nutrition during pregnancy.

The improvement in attitudes in this study is also supported by the use of diverse media and participatory approaches. As stated in the research of Dasmaseila et al. (2026), an interactive and sustainable BCC approach allows pregnant women not only to receive information but also process and internalize knowledge into positive attitudes. Education that involves discussion and Q&A provides space for pregnant women to explore their beliefs and perceptions, which ultimately shapes more positive attitudes.

3. The Effectiveness of Nutrition Education on Nutrition Practices of Pregnant Women

Improving nutrition practices is the most important outcome in educational interventions because it reflects the success of converting knowledge into real behavior. The results showed the largest

increase in practice scores compared to other variables, from 57.8 to 78.3 (an increase of 20.5 points, $p=0.000$), with the proportion of pregnant women practicing well increased from 20% to 70%.

These findings are in line with Dasmaseila et al. (2026) who reported an increase in practice scores from 62.04 to 69.10 ($\Delta +7.06$, $p=0.001$) and emphasized that the improvement in practice was the biggest change that reflected the successful conversion of knowledge into behavior. Research at the Kebon Jeruk District Health Center also showed an increase in the practice of pregnant women from 71.09 to 82.17 after education (Esa Unggul University, 2022).

The success in changing nutrition practices in this study can be attributed to several factors:

1. A comprehensive educational approach not only conveys information but also builds practical skills through demonstrations and real-life examples. As revealed in the research of Dasmaseila et al. (2026), BCC education is provided weekly through 20 topics covering practical aspects such as food processing and menu planning.
2. Supplementary feeding (PMT) in this study serves as a model and facilitator of behavior change. By receiving nutritious food, pregnant women experience firsthand how healthy food should be consumed. Dasmaseila et al. (2026) showed that PMT consumption adherence was the strongest predictor of improved nutritional status, with a value of $\beta = 0.41$ for increased LiLA.
3. Family support involved in the educational process creates an environment that supports behavior change. Research shows that pregnant women who get support from their

husbands and families tend to be more motivated to adopt a healthy diet.

4. The duration of the 4-week intervention with 4 educational sessions allows for reinforcement and repetition of messages, which are essential for long-term behavior change. This is in contrast to the research of Sahrir et al. (2026) which showed that one-time education is not effective in changing behavior.

4. The Effectiveness of Nutrition Education on the Nutritional Status of Pregnant Women

1) Changes in Upper Arm Circumference (LiLA)

The results showed a significant increase in LiLA from 23.1 cm to 23.8 cm (an increase of 0.7 cm, $p=0.002$), with a decrease in the prevalence of SEZ risk from 30% to 16.7%. These findings are in line with Dasmasele et al. (2026) who reported an increase in LiLA of 0.9 cm in 16 weeks and a decrease in the prevalence of SEZs from 27.4% to 18.2% (-9.2 percentage points). Community service research on 25 pregnant women also showed that education and mentoring were effective in reducing the prevalence of KEK from 68% to 32% after intervention (Tim PkM UIN Alauddin, 2025).

An increase in LiLA is an important indicator because it reflects an improvement in fat reserves and muscle mass, which is an indicator of long-term nutritional status. Research at the Patia Health Center, Pandeglang Regency showed that nutritional knowledge is a significant determinant factor in the incidence of SEZ in pregnant women ($p=0.001$; $OR=0.013$) (Research Team, 2025). This emphasizes that effective nutrition education can reduce the risk of SEZs through increased knowledge and behavior change.

Furthermore, Dasmasele et al. (2026) showed that increased LiLA was positively associated with birth weight and length, as well as decreasing the proportion of BBLR and short birth length. Mothers with an increase in LiLA of about 0.9 cm are more likely to give birth to babies with a birth weight of ≥ 3000 g and a birth length of ≥ 48 cm, which ultimately contributes to better baby growth at 3 and 6 months of age.

2) Weight Changes

An average weight gain of 2.6 kg over 4 weeks (equivalent to 0.65 kg/week) indicates a pattern of gain that is in accordance with the recommendations for the II-III trimester. Dasmasele et al. (2026) reported a weight gain of 5.8 kg in 16 weeks (0.36-0.40 kg/week). This difference in the rate of increase can be explained by the difference in the duration of the intervention and the initial characteristics of the respondents, but both show an increase pattern in accordance with the recommendations of the Institute of Medicine (IOM, 2009).

The analysis of Dasmasele et al. (2026) showed that compliance with PMT consumption ($\beta=0.38$) and nutritional practices ($\beta=0.31$) were significant predictors of weight gain. This indicates that interventions that successfully improve nutritional practices and PMT consumption adherence will have an impact on optimal weight gain. Weight gain according to recommendations is important to prevent low birth weight (BBLR) and other fetal growth disorders.

3) Changes in Hemoglobin Levels

The results showed a significant increase in hemoglobin levels from 10.8 g/dL to 11.8 g/dL (an increase of 1.0 g/dL, $p=0.000$), with a decrease in the prevalence of anemia from 46.7% to 26.7%. These findings are in line with Dasmasele et al. (2026) who reported an increase in

hemoglobin levels from 11.0 g/dL to 11.8 g/dL ($p < 0.001$). Community service research also reports that education and mentoring have succeeded in reducing the prevalence of anemia from 60% to 20% (PkM Team UIN Alauddin, 2025).

Success in increasing hemoglobin levels can be attributed to several factors:

1. Education about anemia and iron increases maternal awareness of the importance of preventing anemia
2. Education on the adherence to supplement consumption (blood supplement tablets)
3. Education about iron-rich food sources and factors that affect iron absorption (vitamin C increases absorption, tea/coffee inhibits)

Research at Universitas Airlangga (2025) shows that health education through technology such as telemedicine, mobile applications, and social media is effective in increasing nutritional literacy and reducing the risk of anemia in pregnant women. These findings reinforce the results of research that effective education can overcome anemia in pregnant women, even in groups with socioeconomic factors at risk.

Dasmasela et al. (2026) showed that PMT consumption adherence ($\beta = 0.36$) and supplement consumption adherence ($\beta = 0.33$) were significant predictors of increased hemoglobin levels. This emphasizes the importance of a multi-component approach (education, PMT, and supplementation) in overcoming anemia in pregnant women.

4) The Relationship between Knowledge, Attitudes, Practices and Nutritional Status

The results showed that improving nutritional knowledge, attitudes, and practices together contributed to improving nutritional status. Improved practices were the biggest change and had

the strongest correlation with improvements in nutritional status. This is in line with the findings of Dasmasela et al. (2026) who show that nutritional attitudes and practices contribute positively to weight gain, and PMT consumption adherence as the strongest predictor of LiLA increase.

Research at the Patia Health Center, Pandeglang Regency showed that nutritional knowledge ($p = 0.001$) and diet ($p = 0.001$) were significantly related to the incidence of KEK in pregnant women (Research Team, 2025). These findings reinforce that increasing knowledge through education will have an impact on improving diet and ultimately nutritional status.

A literature review by Rania (2025) concluded that nutrition education has an effect on changes in knowledge and attitudes of pregnant women. Anita's (2025) research also shows that interactive education through snake and ladder games is effective in increasing pregnant women's knowledge about stunting and maintaining knowledge retention for up to two weeks after the intervention. This shows that interactive and repetitive educational methods have a more sustainable impact.

5. CONCLUSION

1. Providing nutrition education effectively improves the nutritional knowledge of pregnant women in Tanjungsari Village, with an increase in average score from 62.4 to 86.7 ($p = 0.000$).
2. The provision of nutrition education was effective in improving the nutritional attitude of pregnant women in Tanjungsari Village, with an increase in the average score from 45.8 to 62.5 ($p = 0.001$).
3. The provision of nutrition education was effective in improving the nutritional

- practices of pregnant women in Tanjungsari Village, with an increase in the average score from 57.8 to 78.3 ($p=0.000$).
4. The provision of nutrition education is effective in improving the nutritional status of pregnant women in Tanjungsari Village, which is shown by:
 - 1) Increase in LiLA from 23.1 cm to 23.8 cm ($p=0.002$)
 - 2) Weight gain from 54.2 kg to 56.8 kg ($p=0.001$)
 - 3) Increased hemoglobin levels from 10.8 g/dL to 11.8 g/dL ($p=0.000$)
 - 4) Decrease in the prevalence of SEZ risk from 30% to 16.7%
 - 5) Decrease in the prevalence of anemia from 46.7% to 26.7%
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