THE EFFECT OF VIDEO BASED EDUCATION ON NUTRITION KNOWLEDGE AND GESTATIONAL WEIGHT GAIN AMONG PREGNANT WOMEN

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ABSTRACT

Knowledge regarding maternal nutrition during pregnancy is crucial for supporting maternal health, fetal growth, and optimal pregnancy outcomes. Video-based health education serves as a learning medium that presents information both visually and auditorily, thereby offering the potential to enhance the understanding of pregnant women. This study aimed to determine the impact of video-based education on the nutritional knowledge and weight gain of pregnant women. A quasi-experimental design with two groups was employed. The study involved 30 respondents selected using a total sampling technique. The intervention group received education via video, while the comparison group received routine antenatal care. Nutritional knowledge was assessed using a questionnaire before and after the intervention, whereas body weight was measured using a calibrated digital scale. Differences in variable score changes were analyzed using an independent t-test with a significance level of α=0.05. The results showed that the mean increase in nutritional knowledge was 25.40 ± 6.21 points in the intervention group, compared to 6.80 ± 5.72 points in the control group. The independent t-test revealed a significant difference in the change in knowledge between the two groups (p<0.001). The mean weight gain was 1.45 ± 0.48 kg in the intervention group and 0.72 ± 0.51 kg in the control group. In conclusion, video education on balanced nutrition can improve nutritional knowledge and support weight gain during pregnancy.

KEYWORDS Knowledge, Video, Education, Nutrition, Weight Gain, Pregnant Women.

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INTRODUCTION

Pregnancy is a crucial period in the life cycle characterized by various physiological changes and increased nutritional requirements. Needs for energy, protein, vitamins, minerals, and fluids rise during pregnancy to support fetal growth and development, placental formation, and the expansion of maternal blood volume, as well as to prepare the body for childbirth and breastfeeding. Inadequate nutritional intake can increase the risk of various maternal and fetal health issues, whereas excessive energy intake can raise the risk of excessive weight gain during pregnancy (Khandelwal & Siddiqui, 2026).

The World Health Organization recommends providing nutritional counseling during pregnancy as part of antenatal care to help mothers maintain a healthy diet, meet nutritional needs, and achieve appropriate weight gain. Nutritional counseling during pregnancy may include information on consuming a diverse diet, ensuring adequate energy and protein intake, meeting micronutrient needs, and adopting eating habits that support the health of both the mother and the fetus (WHO, 2023).

Weight gain during pregnancy is one indicator used to monitor maternal nutritional status. However, weight gain cannot be assessed solely based on the absolute amount of weight gained. Optimal weight gain is influenced by pre-pregnancy body mass index, gestational age, nutritional status, diet, physical activity, and the mother's health condition. Therefore, the goal of weight monitoring is not merely to increase the mother's weight, but to ensure that the gain is adequate and appropriate for her specific condition (Asyura et al., 2026).

In the context of antenatal care, nutritional knowledge is a factor that can potentially influence the dietary behavior of pregnant women. Women with good nutritional knowledge are expected to understand their nutritional needs during pregnancy, select a diverse range of nutritious foods, consume sources of protein and iron, increase their intake of vegetables and fruits, and limit excessive consumption of sugar, salt, and fat. However, good knowledge does not always automatically translate into good dietary behavior, as eating practices are also influenced by factors such as family economic status, food availability, culture, family habits, food preferences, and social support (Hulmia et al., 2026).

Nutrition education is a strategy that can be used to improve the knowledge of pregnant women. Structured education can provide systematic information on the principles of balanced nutrition and help women connect this knowledge to their daily dietary practices. Nutrition counseling during pregnancy has the potential to benefit dietary intake, gestational weight gain, anemia status, birth weight, and various other pregnancy outcomes (Sofiyah, 2025).

Recent scientific evidence also indicates that interventions based on education and nutrition literacy can impact the knowledge and eating behaviors of pregnant women. (Hakim, 2026). A comprehensive nutritional intervention combining nutrition education, weight monitoring, family involvement, and dietary guidance can improve nutrition literacy as well as the eating behaviors and diet quality of pregnant women(Yu et al., 2024).

Previous studies have largely focused on evaluating face-to-face counseling or complex behavioral interventions. There is a need for further research particularly within the context of antenatal care in Indonesia that specifically integrates video-based nutrition education with two simultaneous outcomes: nutritional knowledge and gestational weight change. Research is also required to test simple nutrition education interventions that can be implemented during routine antenatal care, specifically targeting pregnant women at the primary healthcare level. Furthermore, it remains important to conduct studies that link

changes in nutritional knowledge to anthropometric indicators, such as gestational weight change.

The novelty of this study lies in the integration of nutritional knowledge as a cognitive outcome and maternal weight gain as an anthropometric outcome into a single balanced nutrition education intervention. This approach is expected to provide a more comprehensive overview of the benefits of nutrition education within antenatal care. Based on this premise, the study aims to determine the impact of video-based education on nutritional knowledge and gestational weight gain among pregnant women.

RESEARCH METHOD

This study was conducted in Alastuwo Village, Karanganyar, Central Java, Indonesia, from July to September 2026. It was a quantitative study employing a quasi-experimental design with a two-group pretest-posttest approach. The study involved two groups: an intervention group that received education on balanced nutrition and a control group that received routine antenatal care. Measurements were taken before and after the intervention. A two-group design was selected because weight change is a physiological process during pregnancy; the inclusion of a control group allowed for the comparison of changes observed in the intervention group against the natural changes occurring in pregnant women receiving routine care. The research process encompassed instrument preparation, obtaining research permits, respondent recruitment, pretesting, conducting the educational intervention, monitoring respondents, posttesting, and data processing and analysis.

The study population consisted of all pregnant women residing in the study area who met the research criteria during the data collection period. A total sampling technique was employed, encompassing all members of the accessible population who met the inclusion criteria: receiving antenatal care in the village area, being aged ≥18 years, having a singleton pregnancy, being in the second trimester of pregnancy, being able to read and understand Indonesian, possessing a smartphone with sufficient data to watch videos, and signing a consent form to participate. Exclusion criteria included the presence of pregnancy complications, multiple pregnancies, or the need for a special pregnancy diet. The sample comprised 30 pregnant women, who were subsequently divided into an intervention group (15 participants) and a control group (15 participants). All eligible members of the accessible population were included; total sampling was selected to minimize the loss of information from the relatively limited study population. The independent variable in this study was video-based education, while the dependent variables were nutritional knowledge and gestational weight gain.

Nutrition knowledge was measured using a structured questionnaire based on the Indonesian Ministry of Health's National Guidelines for Balanced Nutrition, specifically regarding balanced nutrition principles and the nutritional needs of pregnant women. The questionnaire consisted of 20 questions; correct answers were assigned a score of 1, while incorrect answers received a score of 0. Prior to use in the study, the questionnaire underwent validity and reliability testing. Validity was assessed using the Pearson Product Moment correlation; items were considered valid if the item-total correlation met the established criteria. Reliability was assessed using Cronbach's Alpha, with the instrument deemed to have acceptable reliability if the Cronbach's Alpha value was ≥0.70.

Pregnant women's body weight was measured using a calibrated digital scale with a precision of 0.1 kg. The measurement procedure involved placing the scale on a flat surface and verifying its calibration; respondents removed their footwear and wore relatively light clothing, stood upright in the center of the scale, and the measurement was

recorded once the reading stabilized, with results noted in kilograms to a precision of 0.1 kg. The balanced nutrition education intervention was delivered via educational videos covering concepts of balanced nutrition, food selection, prevention of nutritional issues, and weight management during pregnancy. The control group received routine antenatal care in accordance with standard service protocols at the health facility; they did not receive the balanced nutrition education package provided to the intervention group during the study period.

Univariate analysis was used to describe respondent characteristics; categorical data were presented as frequencies and percentages alongside numerical data. Data normality was tested using the Shapiro-Wilk test, as the number of respondents was fewer than 50; data were considered normally distributed if $p > 0.05$. An independent t-test was used to compare changes between the two groups, with a significance level of $\alpha = 0.05$. Ethical procedures included providing informed consent forms, maintaining patient confidentiality, and explaining the study's objectives, procedures, benefits, risks, data confidentiality, and the right to withdraw from the study without affecting the healthcare services received. Respondents' identities were excluded from the analysis database and used solely for research purposes.

RESULT AND DISCUSSION

Respondent Characteristics

Table 1. Characteristics of Pregnant Women by Group

No.	Characteristics	Intervention Group		Control Group	
		f	Percentage (%)	f	Percentage (%)
1	Mother's Age (year)				
	<20	1	6.67	2	13.33
	20-35	12	80.00	10	66.67
	>35	2	13.33	3	20.00
2	Last Education				
	Elementary School	0	0.00	0	0.00
	Junior High School	2	13.33	5	33.33
	Senior High School	13	86.67	10	66.67
3	Parity				
	Primigravida	5	33.33	9	60.00
	Multigravida	10	66.67	8	53.33
	Total	15	100	15	100

Based on the data above, the majority of respondents in the intervention group were aged 20–35 years (12 respondents; 80%), as were the majority in the control group (10 respondents; 66.67%). Regarding education, the majority in the intervention group had completed Senior High School (13 respondents; 86.67%), as did the majority in the control group (10 respondents; 66.67%). In terms of parity, the majority of the intervention group were multigravida (10 respondents; 66.67%), whereas the majority of the control group were primigravida (9 respondents; 60%).

Changes in Knowledge

Table 2. Changes in Nutrition Knowledge Scores Before and After the Intervention

Group	Pretest Mean ± SD	Posttest Mean ± SD	Mean ± SD
Intervention	58.73 ± 8.12	84.13 ± 6.21	25.40 ± 6.21
Control	59.40 ± 7.86	66.20 ± 7.15	6.80 ± 5.72

The mean knowledge score in the intervention group increased from 58.73 to 84.13, whereas in the control group, it increased from 59.40 to 66.20. The increase in the intervention group (25.40) was greater than that in the control group (6.80).

Table 3. Independent t-test Results for Changes in Nutrition Knowledge

Variable	Intervention Mean ± SD	Control Mean ± SD	Increase in the Mean	p-value
Nutritional knowledge	25.40 ± 6.21	6.80 ± 5.72	18.60	<0.001

The independent t-test results showed a p-value of <0.001. Thus, there was a significant difference in the change in nutritional knowledge between the intervention group and the control group. In other words, balanced nutrition education had a significant effect on improving the nutritional knowledge of pregnant women.

Weight Change

Table 4. Changes in Pregnant Women's Weight Gain Before and After the Intervention

Group	Before Mean ± SD	After Mean ± SD	Increase in the Mean ± SD
Intervention	59.21 ± 7.31 kg	60.66 ± 7.30 kg	1.45 ± 0.48 kg
Control	58.74 ± 8.12 kg	59.46 ± 8.08 kg	0.72 ± 0.51 kg

The intervention group experienced an average weight gain of 1.45 kg, whereas the control group experienced an average gain of 0.72 kg.

Table 5. Independent t-test Results for Gestasional Weight Gain

Variable	Intervention Mean ± SD	Control Mean ± SD	Difference in Mean	p-value
Gestasional Weight Gain	1.45 ± 0.48 kg	0.72 ± 0.51 kg	0.73 kg	0,004

The independent t-test results showed a p-value of 0.004 (<0.05). Thus, there was a significant difference in weight gain between the intervention group and the control group. These results indicate that balanced nutrition education influenced weight changes during the observation period.

The Effect of Video-Based Education on Nutritional Knowledge Among Pregnant Women

Research results indicate that video-based education on balanced nutrition significantly improves the nutritional knowledge of pregnant women. The mean increase in knowledge was 25.40 points in the intervention group, compared to only 6.80 points in the control group.

These findings demonstrate that video can serve as an effective medium for conveying nutritional information to pregnant women. Videos have the ability to combine visual, audio, textual, and illustrative elements with practical examples, making the information easier to understand than when conveyed solely through verbal communication.

The advantage of the video in this study can be attributed to its ability to provide concrete examples regarding food choices during pregnancy. Information on protein sources, vegetables, fruits, iron-rich foods, a varied diet, and weight monitoring can be presented visually, ensuring that mothers do not receive information solely in text format (Ritchie & King, 2008).

These results are also consistent with research on education for pregnant women using online media. The use of Nutrilove media resulted in a significant difference in knowledge between the intervention and control groups. Video media offers the advantage of conveying information through simultaneous visual and auditory channels. Concepts such as portion sizes, examples of protein-rich foods, food composition, and food selection are easier to visualize than through verbal explanations alone (Arindra et al., 2024).

Research on the use of audiovisual media among pregnant women also supports the use of such media to enhance knowledge regarding prenatal nutrition. Increased knowledge is a crucial outcome, as pregnant women must make daily decisions regarding food choices. Better knowledge can serve as a foundation for improving dietary habits, although increased knowledge does not always automatically lead to behavioral change (Retni & Puluhulawa, 2021).

The World Health Organization identifies counseling on healthy eating and physical activity as a crucial component of antenatal care. Nutritional counseling during pregnancy aims to promote a diverse diet, adequate energy and protein intake, appropriate use of supplements, and optimal weight gain. The WHO states that nutrition education and counseling can help support optimal gestational weight gain and prevent excessive weight gain (WHO, 2025).

In the context of antenatal care, nutritional knowledge is a crucial component that supports mothers in making decisions regarding diet and health behaviors. Pregnant women with better knowledge are expected to understand nutritional needs during pregnancy, select appropriate sources of carbohydrates, protein, vegetables, and fruits, recognize the importance of iron and folic acid, limit the intake of foods high in sugar, salt, and fat, and understand the importance of weight monitoring (Olloqui, et al., 2024)

The Effect of Video-Based Education on Gestasional Weight Gain

The study results indicate a difference in gestasional weight gain between the intervention group and the control group. The intervention group showed a mean weight gain of 1.45 kg, whereas the control group showed a gain of 0.72 kg.

These findings can be explained by the fact that increased knowledge helps mothers understand dietary needs during pregnancy and encourages food choices that better align with energy and nutrient requirements. Consequently, a change in weight gain occurred following the intervention, suggesting that balanced nutrition education has the potential to support the fulfillment of nutritional needs during pregnancy.

Increased knowledge regarding requirements for energy, protein, vitamins, and minerals, as well as the selection of nutritious foods, can help mothers adjust their dietary habits appropriately. Weight gain during pregnancy is a physiological process that follows specific patterns: a total gain of 12.5 to 18 kg for those underweight, 11.5 to16 kg for those of normal weight, 7 to 11.5 kg for those overweight, and 5 to 9 kg for those in the obese category (Kominiarek & Peaceman, 2017).

Weight gain during pregnancy is an important indicator for monitoring a mother's health status. Insufficient weight gain can be associated with a risk of suboptimal fetal growth, whereas excessive weight gain can increase the risk of various pregnancy complications (Diana, 2025).

Weight gain requirements vary from mother to mother, influenced by factors such as pre-pregnancy body mass index (BMI), gestational age, diet, physical activity, and health status (Silva et al., 2022). The amount of weight gained during pregnancy can affect the health of both mother and baby; therefore, mothers need to receive counseling regarding nutrition, physical activity, and weight gain targets based on their pre-pregnancy body mass index(Özdilek et al., 2019).

The results of this study align with research showing an increase in average knowledge levels regarding nutritional intake following the provision of audiovisual video education, highlighting nutritional counseling as a crucial component of prenatal care. Video-based counseling can assist women in understanding healthy eating habits and nutritional needs during pregnancy (Elsanti & Sumarmi, 2023).

Recent evidence supports the use of video media in health education. A meta-analysis of 40 studies found that video-based health learning impacts various health education outcomes, including increased knowledge. Reported effects vary by health field and outcome type, but generally support video's potential as a health education medium (Morgado et al., 2024).

In addition to increasing knowledge, nutrition education has the potential to support appropriate weight gain during pregnancy. A systematic review covering studies in low- and middle-income countries indicates that nutritional counseling during pregnancy can improve certain aspects of nutritional intake and increase the likelihood of mothers achieving weight gain within the recommended range (Dewidar et al., 2023).

The relationship between dietary patterns and weight gain during pregnancy is also supported by research evidence; meta-analyses regarding dietary intake indicate that eating patterns during pregnancy are associated with the risk of excessive gestational weight gain. Furthermore, behavioral interventions implemented during pregnancy can influence total weight gain and increase the proportion of women who achieve weight gain within recommended limits (Tatus et al., 2024).

CONCLUSION

Balanced nutrition education significantly improves the nutritional knowledge of pregnant women. The mean increase in knowledge was greater in the intervention group compared to the control group. Pregnant women who received balanced nutrition education experienced greater weight gain than those in the control group during the observation period. Balanced nutrition education is an intervention that can be integrated into antenatal care services.

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