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(RESEARCH ARTICLE)

A Comparative Study on the Effectiveness of Video and Leaflet Media as Nutritional Education Interventions in Improving Knowledge, Attitudes, and Dietary Practices Related to Iron-Rich Food Consumption Among Pregnant Women in the Service Area of Abeli Primary Health Center, Kendari City, 2025

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Abstract

Anemia among pregnant women remains a major public health problem associated with an increased risk of pregnancy and childbirth complications. Nutritional education is a key strategy for anemia prevention; however, the effectiveness of educational media varies. This study aimed to compare the effectiveness of video and leaflet media as nutritional education interventions in improving knowledge, attitudes, and dietary practices related to iron-rich food consumption among pregnant women at Abeli Primary Health Center, Kendari City. A quasi-experimental pretest–posttest study with a comparison group was conducted among 40 pregnant women, equally assigned to video- and leaflet-based intervention groups. Knowledge, attitudes, and dietary practices were measured before and after the intervention using a structured questionnaire. Data were analyzed using the Wilcoxon test, paired t-test, Mann–Whitney test, N-Gain analysis, and effect size estimation. Both media significantly improved knowledge ($p < 0.001$), with greater improvement in the video group. Attitudes improved significantly only in the video group ($p < 0.001$), while no significant changes in dietary practices were observed in either group. In conclusion, video-based nutritional education was more effective than leaflet-based education in improving knowledge and attitudes; however, sustained interventions are needed to promote behavioral change.

Keywords: Nutritional education; Video media; Leaflet; Anemia; Pregnant women; Iron

1. Introduction

Anemia among pregnant women remains a significant public health problem, particularly in developing countries, as it directly affects maternal and fetal health. Anemia during pregnancy is associated with an increased risk of obstetric complications, including preterm birth, hemorrhage, low birth weight, and increased maternal and neonatal morbidity and mortality (1,2). Therefore, anemia prevention is a crucial component of maternal healthcare services.

One of the main contributing factors to anemia in pregnant women is inadequate dietary iron intake. Limited knowledge regarding iron-rich food sources, unsupportive attitudes, and dietary practices that do not comply with nutritional recommendations are commonly observed among pregnant women (3). Efforts to increase iron-rich food consumption depend not only on food availability but also on pregnant women's awareness and understanding of the importance of iron during pregnancy.

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Nutritional education is widely implemented as a promotive and preventive strategy to improve knowledge, attitudes, and dietary behaviors among pregnant women. Various educational media are utilized in health programs, including printed materials such as leaflets and audiovisual media such as videos. Video-based media offer advantages by delivering information through visual and auditory channels, which enhance attention, comprehension, and information retention compared to printed media (4). Nevertheless, leaflets remain widely used in primary healthcare facilities due to their ease of distribution and cost-effectiveness.

Previous studies have reported that audiovisual-based educational media are more effective in improving knowledge and attitudes than printed media (5). However, findings related to changes in dietary practices remain inconsistent. Several studies indicate that improvements in knowledge and attitudes do not always lead to immediate behavioral changes (6), suggesting a gap between cognitive and affective improvements and actual behavior change.

Based on these considerations, this study aimed to directly compare the effectiveness of video and leaflet media as nutritional education interventions in improving knowledge, attitudes, and dietary practices related to iron-rich food consumption among pregnant women, particularly in the context of primary healthcare services. This study was conducted in the service area of Abeli Primary Health Center, Kendari City, to provide empirical evidence supporting the selection of more effective nutritional education media for anemia prevention among pregnant women.

2. Material and methods

2.1. Study Design and Setting

This study employed a quasi-experimental design using a pretest–posttest approach with a comparison group to evaluate the effectiveness of video and leaflet media as nutritional education interventions. The study was conducted in the service area of Abeli Primary Health Center, Kendari City, in 2025, in accordance with the context of primary healthcare services.

2.1.1. Participants and Sampling Technique

The study participants were pregnant women registered and receiving antenatal care at Abeli Primary Health Center. A purposive sampling technique was applied based on predefined inclusion and exclusion criteria. Participants were allocated into two intervention groups: a video-based nutritional education group and a leaflet-based nutritional education group.

2.1.2. Nutritional Education Intervention Media

The video intervention included educational content on anemia during pregnancy, the importance of iron, and examples of iron-rich foods that are easily accessible and commonly consumed. The leaflet intervention presented identical content in printed form using simple language and supportive illustrations. Both media were designed to deliver equivalent educational messages to ensure that outcome differences reflected media effectiveness rather than content variation.

2.2. Instruments, Procedures, and Data Analysis

Data were collected using a structured questionnaire assessing knowledge, attitudes, and dietary practices related to iron-rich food consumption. Measurements were conducted before (pretest) and after (posttest) the intervention. Data analysis included univariate and bivariate analyses to assess pre–post differences and compare intervention effectiveness between groups.

3. Results and discussion

3.1. Respondent Characteristics

The characteristics of pregnant women respondents according to the video and leaflet intervention groups are presented in Tables 1 to 5. The analyzed variables included maternal age, gestational age, parity, educational level, and occupation.

3.1.1. Maternal Age

The distribution of maternal age indicates that the majority of respondents in both the video and leaflet intervention groups were within the ideal reproductive age range (20–35 years), as shown in Table 1. This finding suggests that most participants belonged to an age group associated with a relatively lower risk of pregnancy-related complications.

Table 1 Distribution of Maternal Age by Intervention Group

Age Group	Video Media n (%)	Media Leaflet n (%)
Teenagers (10–19 yrs)	2 (10,0)	1 (5,0)
Ideal age (20–35 years)	17 (85,0)	16 (80,0)
High risk (>35 years)	1 (5,0)	3 (15,0)
Total	20 (100)	20 (100)

3.1.2. Gestational Age

The majority of respondents in both the video and leaflet intervention groups were in the first and second trimesters of pregnancy, as presented in Table 2. This indicates that the nutritional education intervention was implemented during a relatively early stage of pregnancy.

Table 2 Distribution of Gestational Age of Respondents

Trimester	Media Leaflet n (%)	Video Media n (%)
Trimester I	11 (55,0)	10 (50,0)
Trimester II	7 (35,0)	7 (35,0)
Trimester III	2 (10,0)	3 (15,0)
Total	20 (100)	20 (100)

3.1.3. Parity

The distribution of parity among pregnant women indicates that the majority of respondents in both intervention groups were multiparous, as shown in Table 3. This relatively balanced distribution supports the comparability of baseline characteristics between the two groups.

Table 3 Distribution of Parity Among Pregnant Women

Parity	Video Media n (%)	Media Leaflet n (%)
Nullipara	2 (10,0)	0 (0%)
Primipara	7 (35,0)	7 (35,0)
Multipara	11 (55,0)	13 (65,0)
Total	20 (100)	20 (100)

3.1.4. Educational Level

The majority of respondents in both the video and leaflet intervention groups had completed senior high school or an equivalent level of education, as shown in Table 4. This level of educational attainment may influence respondents' ability to receive, comprehend, and process nutritional education materials.

Table 4 Distribution of Educational Level Among Pregnant Women

Education	Video Media n (%)	Media Leaflet n (%)
No School	2 (10,0)	0 (0,0)
Elementary School	3 (15,0)	2 (10,0)
Junior High School	2 (10,0)	7 (35,0)
High School	11 (55,0)	10 (50,0)
College	2 (10,0)	1 (5,0)
Total	20 (100)	20 (100)

3.1.5. Occupation

The majority of respondents in both intervention groups were housewives, as presented in Table 5. This finding reflects the socioeconomic characteristics of the respondents in the study area.

Table 5 Distribution of Occupation Among Pregnant Women

Jobs	Video Media n (%)	Media Leaflet n (%)
Housewives	16 (80,0)	11 (55,0)
Self-employed	3 (15,0)	4 (20,0)
Civil Cervant (PNS)	0 (0,0)	3 (15,0)
Teacher	1 (5,0)	2 (10,0)
Total	20 (100)	20 (100)

3.2. Effect of Educational Media on Pregnant Women's Knowledge

Changes in pregnant women's knowledge scores before and after the nutritional education intervention are presented in Table 6. In the video intervention group, the median knowledge score increased from 10.67 to 13.97, representing an improvement of 3.3 points. The Wilcoxon test indicated that this increase was statistically significant ($p = 0.000$).

In the leaflet intervention group, the median knowledge score increased from 9.97 to 12.97, with an improvement of 3.0 points. The paired t-test also demonstrated a statistically significant difference between pretest and posttest scores ($p = 0.000$).

Table 6 Differences in Pregnant Women's Knowledge Scores Before and After Nutritional Education

Groups	Pretest Median (Min–Max)	Posttest Median (Min–Max)	Δ	p-value	Test
Video	10,67 (8–15)	13,97 (12–15)	+3,3	0,000	Wilcoxon
Leaflet	9,97 (3–14)	12,97 (11–14)	+3,0	0,000	Paired T-Test

These results indicate that both educational media were effective in improving knowledge; however, the increase observed in the video intervention group was greater, suggesting the superiority of audiovisual media in delivering nutritional information.

3.3. Effect of Educational Media on Pregnant Women's Attitudes

Changes in pregnant women's attitudes toward the consumption of iron-rich foods are presented in Table 7. In the video intervention group, 17 respondents demonstrated an improvement in attitudes, and the Wilcoxon test indicated a statistically significant difference between pretest and posttest scores ($p = 0.000$).

In contrast, in the leaflet intervention group, most respondents showed no change in attitudes, and the statistical analysis revealed no significant difference (p = 0.705).

Table 7 Differences in Pregnant Women's Attitude Scores Before and After Nutritional Education

Intervention	Δ	Statistical Test	p-value	Conclusion
Video	17 (up)	Wilcoxon	0,000	Significant effectiveness
Leaflet	13 (fixed)	Wilcoxon	0,705	Insignificant

These findings indicate that video-based media are more effective in fostering positive attitudes, as they are better able to influence respondents' emotional engagement and perceptions compared to printed media.

3.4. Effect of Educational Media on Iron-Rich Food Consumption Practices

Changes in practices related to the consumption of iron-rich foods are presented in Table 8. In the video intervention group, the mean practice score increased by 2.95 points; however, the paired t-test indicated that this improvement was not statistically significant (p = 0.166).

In the leaflet intervention group, the majority of respondents (10 participants) showed no change in practices, and the Wilcoxon test also revealed no statistically significant difference (p = 0.058).

Table 8 Differences in Pregnant Women's Practice Scores Before and After Nutritional Education

Groups	Changes	Statistical Test	p-value	Remarks
Video	Mean 45.85 → 42.90 (Δ +2.95)	Paired T-Test	0,166	Insignificant
Leaflet	Majority Fixed (10)	Wilcoxon	0,058	Insignificant

These results suggest that changes in dietary practices require time and support from other factors, such as established eating habits, food availability, and family and environmental support, and therefore do not necessarily occur immediately following improvements in knowledge and attitudes.

3.5. Synthesis of Findings

Overall, the study findings indicate that video-based educational media were superior to leaflet-based media in improving pregnant women's knowledge and attitudes toward the consumption of iron-rich foods. Although improvements in dietary practices did not reach statistical significance, the direction of change was more favorable in the video intervention group. These findings highlight audiovisual media as a more effective and promising nutritional education approach for implementation in maternal healthcare services at the primary healthcare level.

4. Conclusion

This study demonstrates that nutritional education interventions using both video and leaflet media were effective in improving pregnant women's knowledge regarding iron-rich food consumption. However, video-based educational media proved to be more effective than leaflet-based media in enhancing knowledge and fostering positive attitudes, while changes in dietary practices related to iron-rich food consumption did not show statistically significant differences in either group.

The superiority of video-based media lies in their ability to deliver information through engaging audiovisual content that is easier to understand, thereby strengthening pregnant women's comprehension and attitudes toward the importance of adequate iron intake during pregnancy. Although behavioral changes were not optimal, the more favorable trend observed in the video intervention group underscores the potential of video-based media as a more effective nutritional education tool.

These findings provide valuable implications for maternal healthcare services by informing the selection of more appropriate nutritional education media in primary healthcare settings and supporting the development of sustainable

audiovisual-based educational interventions to enhance anemia prevention efforts among pregnant women in the community.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare that there are no financial or non-financial conflicts of interest that could have influenced the conduct, results, or publication of this study. No institutions or commercial products were involved that could potentially affect the study outcomes.

Statement of ethical approval

This study involved human participants and received ethical approval from the appropriate ethics committee in accordance with applicable regulations. All research procedures were conducted in compliance with ethical principles, including data confidentiality and the protection of participants' rights.

Statement of informed consent

Written informed consent was obtained from all participants prior to data collection. Participants were fully informed about the study objectives, procedures, and potential benefits, and their participation was entirely voluntary.

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