



Comparing Video Media and Teaching Aids to Improve Maternal Knowledge of the 'Fill My Plate' Nutrition Program: A Quasi-Experimental Study in Indonesia

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<p>Track Record Article</p> <p>Revised: 26 April 2025 Accepted: 8 June 2025 Published: 14 June 2025</p> <p>How to cite : Siburian, U. D., & Ritonga, P. T. (2025). Comparing Video Media and Teaching Aids to Improve Maternal Knowledge of the 'Fill My Plate' Nutrition Program: A Quasi-Experimental Study in Indonesia. <i>Contagion : Scientific Periodical of Public Health and Coastal Health</i>, 7(1), 117–126</p>	<p style="text-align: center;">Abstract</p> <p><i>Stunting remains a significant public health challenge in Indonesia, affecting an estimated 30% of children as of 2023. One of its primary causes is inadequate dietary intake. In response, the Indonesian government introduced the Fill My Plate nutrition program, promoting food diversity and appropriate portion sizes to ensure balanced meals. This study aimed to compare the effectiveness of video media and teaching aids in improving maternal knowledge of the Fill My Plate program as a strategy to prevent stunting. A quasi-experimental design with pre-test and post-test groups was utilized. The study was conducted in North Tapanuli Regency from July to December 2024, involving 30 mothers of toddlers. Participants were randomly assigned to either the video media group (n = 15) or the teaching aids group (n = 15). Maternal knowledge was assessed using a structured and validated questionnaire. Descriptive statistics were applied for univariate analysis, and an Independent Sample t-test was used for bivariate analysis at a 95% confidence level ($\alpha = 0.05$). Mean differences were calculated to determine effect sizes. The results both interventions significantly improved maternal knowledge ($p < 0.05$). However, there was no statistically significant difference between the two groups ($p > 0.05$), indicating that video media and teaching aids were equally effective as educational tools. No statistically significant difference was observed between the two groups ($p = 0.710$). Video media and teaching aids are both effective in enhancing maternal knowledge about the Fill My Plate nutrition concept. Health educators are encouraged to integrate these media formats into community-based health programs to strengthen maternal engagement and support stunting prevention efforts</i></p> <p>Keywords: <i>Fill My Plate, Maternal knowledge, Nutrition, Teaching aids, Video media</i></p>
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INTRODUCTION

Stunting is a major public health issue that demands urgent attention, particularly in low- and middle-income countries such as Indonesia. Defined as impaired linear growth due to chronic undernutrition during the most critical periods of development, stunting not only affects a child's physical stature but also has far-reaching consequences for cognitive development, school performance, and future economic productivity. Children who are stunted in early life are more likely to suffer from poor academic achievement, reduced earning potential in adulthood, and increased risk of chronic diseases such as diabetes and cardiovascular conditions. The intergenerational impact of stunting can perpetuate cycles of poverty and inequality, making its prevention a top priority in achieving national development goals and improving population health outcomes (Chairunnisa, 2023).

In Indonesia, despite various national efforts, stunting remains highly prevalent. As of 2023, approximately 30% of children were estimated to be stunted. In North Sumatra Province, the prevalence stood at 18.9% in 2023, with a provincial target to reduce this rate to 14.5% by 2024 (Kemenkes RI, 2025). However, in Tapanuli Utara Regency, the prevalence has remained stagnant at 27.4% from 2022 to 2023, signaling a significant public health challenge. Siborong-borong District, in particular, has been identified as one of the subdistricts with the highest incidence of stunting within the regency, necessitating targeted and context-specific intervention strategies (Dinkes Sumut, 2023).

To address nutritional deficiencies contributing to stunting, the Indonesian Ministry of Health launched the *Fill My Plate* campaign in 2017. This initiative emphasizes balanced meals composed of appropriate portions and diverse food groups as a foundation for improved nutritional practices. It is designed as a simple and accessible guideline to promote dietary adequacy in households across various socioeconomic backgrounds (Siahaya et al., 2024)

Nutrition education plays a critical role in improving parental practices related to child feeding. The choice of communication media significantly influences knowledge acquisition, especially among low-literacy populations. Teaching aids have been shown to support knowledge transfer through visual and tactile stimulation (Wijayanti et al., 2024; Rafkhani et al., 2024). While video media engages both auditory and visual senses, potentially enhancing comprehension and retention.

Despite these advantages, limited comparative research has explored which medium is more effective in rural settings with high stunting burdens. This study aims to compare the effectiveness of video media and teaching aids in improving maternal knowledge of the *Fill My Plate* nutrition program in Siborong-borong District. We hypothesize that video media will be more effective due to its multisensory engagement, offering stronger educational outcomes among mothers of toddlers.

METODE

This study utilized a quasi-experimental pre-test and post-test group design to assess the effectiveness of two educational interventions video media and teaching aids in improving maternal knowledge related to the *Fill My Plate* nutrition program. The study sought to determine both the within-group effect of each intervention and the comparative efficacy between the two formats.

The research was conducted in Siborong-borong District, located in Tapanuli Utara Regency, North Sumatra Province, Indonesia a region identified with a high stunting burden.

Data collection was undertaken over a two-month period, from October to November 2024, across selected community-based integrated health service posts.

All participants provided written informed consent prior to participation. The study adhered to the ethical principles outlined in the Declaration of Helsinki and maintained confidentiality and anonymity throughout the research process.

Participants included mothers of children aged 12–59 months attending Posyandu services. A purposive sampling strategy was employed to recruit a total of 30 eligible participants, divided equally into two groups ($n = 15$ each). Inclusion criteria comprised: (1) having at least one toddler, (2) the ability to read and understand Bahasa Indonesia, and (3) willingness to participate voluntarily. The sample size was determined based on feasibility considerations for small-scale community-based interventions and supported by previous literature (Sugiyono, 2022).

Maternal knowledge was evaluated using a 10-item structured questionnaire adapted from the Ministry of Health's national guidelines on balanced nutrition. The questionnaire addressed critical components of the *Fill My Plate* initiative, including recommended food group portions, meal balance, and nutritional adequacy. Each correct response was scored as 1, with a total possible score ranging from 0 to 10. Instrument validity was established through expert review, and reliability testing via pilot administration yielded a Cronbach's alpha coefficient of 0.84, indicating satisfactory internal consistency.

Participants were randomly allocated into two intervention groups. Video Media Group ($n = 15$), Participants were shown a 30-minute educational video in Bahasa Indonesia, which featured animated visualizations and narrations on the *Fill My Plate* principles, food group proportions, and stunting prevention tips. Teaching Aids Group ($n = 15$) Participants received face to face counseling sessions of similar duration, delivered by trained nutrition educators using 3D food models, portion-controlled meal plates, and illustrated nutrition posters. A standardized counseling script was utilized to ensure consistency across all sessions. All sessions were conducted on-site at local Posyandu centers in a one-on-one setting to facilitate personalized learning and interaction.

Data analysis was performed using SPSS version 26. Descriptive statistics were used to summarize demographic characteristics and baseline knowledge scores. To evaluate within-group changes in knowledge, paired t-tests were employed for normally distributed data, and the Wilcoxon signed-rank test for non-parametric distributions. Between-group differences in post-test scores were assessed using the Mann Whitney test. All statistical tests were two-tailed, and significance was determined at $p < 0.05$.

RESULTS

A total of 30 participants were enrolled in this study and evenly allocated into two intervention groups: video media (n = 15) and teaching aids (n = 15). Both groups received counseling on the *Fill My Plate* program. The effectiveness of each medium in improving maternal knowledge was evaluated through pre- and post-intervention assessments.

Tabel 1. Respondent Characteristics

Characteristics	Video Media (n=15)		Teaching Aids (n=15)	
	n	%	n	%
Age				
Age <20	0	0	0	0
Age 20-35	11	73.3	12	80.0
Age >35	4	26.7	3	20.0
Parity				
Parity 1	3	20.0	4	26.7
Parity 2-3	10	66.7	9	60.0
Parity >4	2	13.3	2	13.3
Education				
High School	10	66.7	11	73.3
College	5	33.3	4	26.7
Occupation				
Employed	11	73.3	10	66.7
Unemployed	4	26.7	5	33.3

Participant characteristics are presented in Table 1. The majority of mothers were aged 20–35 years in both groups (73% in the video group and 80% in the teaching aids group). Most participants had secondary education (high school) and were multiparous (2–3 children). A majority of respondents were also engaged in agricultural work, reflecting the rural demographic profile of Siborong-borong District.

Table 2. Distribution of maternal knowledge about stunting in the pretest and posttest

Knowledge Level	Video Media				Teaching Aids			
	Pretest	%	Posttest	%	Pretest	%	Posttest	%
Good	3	20	9	60	4	27	10	67
Enough	8	53	6	40	7	46	5	33
Not Good	4	27	0	0	4	27	0	9
Total	15	100	15	100	15	100	15	100

Table 2. The distribution of maternal knowledge levels before and after the counseling interventions reveals notable improvements across both groups. In the video media group, the proportion of mothers categorized as having “good knowledge” increased substantially from 20% at pre-test to 60% at post-test, while those classified as having “not good” knowledge decreased from 27% to 0%. Similarly, in the teaching aids group, the proportion of mothers with good knowledge rose from 27% to 67%, and no mothers remained in the “not good” category after the intervention.

These findings indicate that both video and teaching aids were effective in enhancing maternal understanding of the *Fill My Plate* program, which plays a crucial role in the prevention of stunting. The elimination of the “not good” knowledge category in both groups suggests that the interventions were particularly successful in addressing the most critical knowledge gaps.

The comparable gains between groups also reinforce the idea that different media formats can be equally effective when used appropriately in health education. This is particularly relevant in rural and low-resource settings, such as Siborong-borong District, where access to digital tools may vary. The ability of both interventions to raise the majority of participants to at least a “sufficient” or “good” knowledge level demonstrates the practical utility and adaptability of both delivery modes for community health promotion.

Table 3. Maternal Knowledge: Pre- and Post-Test Analysis

Group	Pre-test Mean \pm SD	Post-test Mean \pm SD	Mean Difference	p-value	Cohen's d
Video Media	5.01 \pm 0.77	6.68 \pm 0.77	0.67	*0.000	0.87
Teaching Aids	5.31 \pm 1.03	5.92 \pm 1.03	0.62	*0.001	0.6

The results presented in Table 3 demonstrate a statistically significant improvement in maternal knowledge following both video media and teaching aid interventions. In the video media group, the mean knowledge score increased from 5.01 \pm 0.77 to 6.68 \pm 0.77, yielding a mean difference of 0.67 points ($p = 0.000$). Similarly, in the teaching aids group, the mean score increased from 5.31 \pm 1.03 to 5.92 \pm 1.03, with a mean difference of 0.62 points ($p = 0.001$). The effect size, measured using Cohen's d , was 0.87 for the video media group and 0.60 for the teaching aids group.

Table 4. Comparison Between Intervention Groups

Media	N	Mean	P-value
Video	15	0.667	0.710
Teaching Aids	15	0.617	
	30		

Table 4 presents the comparison between the two intervention groups based on the Mann Whitney U test. The analysis revealed a p-value of 0.710, indicating no statistically significant difference in knowledge acquisition between the video media and teaching aids groups. This suggests that both educational media formats are equally effective in enhancing mothers' understanding of the *Fill My Plate* nutrition program.

Although the video group demonstrated a slightly higher mean difference in knowledge scores (0.667) compared to the teaching aids group (0.617), this difference did not reach statistical significance at the 95% confidence level ($\alpha = 0.05$). These findings imply that health educators may select either format based on local resource availability, target population

preferences, or contextual feasibility, without compromising the overall effectiveness of the intervention.

DISCUSSION

Counseling is a core component of health promotion strategies aimed at enhancing knowledge and fostering positive behavioral changes. In this study, both video and teaching aid interventions demonstrated significant improvements in maternal knowledge regarding the Fill My Plate nutrition program. These findings reinforce the value of structured, media-supported health education as a tool for addressing stunting prevention.

1. Effectiveness of Video Media

The results indicated that mothers' knowledge significantly improved following counseling sessions utilizing video media ($p = 0.000$; Cohen's $d = 0.87$). This finding aligns with previous literature, which highlights that video, as an audiovisual medium, effectively engages multiple senses and enhances comprehension and memory retention (Febriani et al., 2024; Andani et al., 2024). The dynamic nature of videos moving images, narration, and storylines facilitates the delivery of complex nutritional concepts in an engaging and memorable format. During the intervention, mothers responded with enthusiasm, asked clarifying questions, and actively shared personal feeding experiences, particularly among multiparous mothers who constituted 67% of the video group.

These observations corroborate the work of Sutrio et al., (2021), who reported enhanced nutrition-related knowledge following video-based interventions. Furthermore, Agustin et al., (2023) found video media to be superior in improving knowledge and attitude compared to other methods such as posters or podcasts, underscoring its multisensory appeal and capacity for accelerating cognitive understanding.

Providing nutrition education through video media has an impact on increasing students' knowledge and attitudes (Agustin et al., 2023). Video is an interesting, effective and efficient media that makes it easier for students to understand the material about nutrition. Nutrition intervention through video media can also improve students' attitudes towards health, especially regarding balanced nutrition (Munir et al., 2024).

2. Effectiveness of Teaching Aids

Similarly, counseling with teaching aids also yielded a significant increase in maternal knowledge ($p = 0.001$; Cohen's $d = 0.60$). Teaching aids, particularly 3D food models used in this study, allowed direct interaction and hands-on engagement, stimulating tactile learning and active participation. Mothers expressed interest in the realistic models and were able to recall

and apply information regarding food group categorization and portioning consistent with the Fill My Plate guidelines.

This mode of learning has been validated in studies by Mayun et al., (2023), which demonstrate that tangible teaching materials improve knowledge retention and facilitate real-life application. The use of teaching aids in the learning process can attract students' attention and motivate them and make them actively involved in the learning process, making it easier to remember, tell and understand the material in a concrete way and students can master the material (Munawar et al., 2020).

3. Comparison Between Intervention Groups

Comparison between the two intervention groups using the Mann–Whitney test yielded a p-value of 0.710, indicating no statistically significant difference in knowledge acquisition between the video and teaching aid groups. This suggests that both forms of media are equally effective in improving mothers' knowledge of the Fill My Plate nutrition program. Although the video group showed a slightly higher mean difference (0.667) compared to the teaching aid group (0.617), this difference was not statistically significant at the 95% confidence level ($\alpha = 0.05$).

Contrary to findings by Mardiani et al., (2024), who reported greater efficacy of video-based learning, our results suggest that in low-resource settings, both video and tactile teaching materials can be equally impactful. The discrepancy may be attributed to contextual factors such as population characteristics, intervention fidelity, or the nature of the educational material. As noted by Indriana et al., (2011), videos can be effective for process explanation and can be repeatedly accessed; however, one-way communication and technological limitations may restrict their utility.

This study demonstrated the effectiveness of two health education interventions video media and teaching aids in enhancing maternal knowledge of the balanced nutrition program, Fill My Plate, as a strategy to prevent stunting in toddlers. The findings revealed a significant improvement in knowledge levels across both intervention groups, with no statistically significant difference between the two methods. These results suggest that both media formats can serve as effective tools for promoting nutritional literacy among mothers in rural communities.

The observed improvement in maternal knowledge aligns with previous studies that underscore the critical role of educational interventions in shaping caregiver behavior and enhancing child nutritional outcomes. A study by Farhan et al., (2024), found that animated videos were very effective in increasing nutritional knowledge compared to statistical media,

due to their visual and auditory engagement features. Research Utaminingsyas (2020), emphasized that tactile teaching aids, such as 3D food models, enhance comprehension, particularly among populations with limited health literacy.

Although video media showed a slightly higher effect size (Cohen's $d = 0.87$) than teaching aids (Cohen's $d = 0.60$), the lack of statistical differences in post-test scores suggests that media format may be less important than the quality and clarity of the content delivered. This finding is consistent with the principle of media equity, which states that different modes of harmonization can produce comparable learning outcomes if the instructional design is tailored to the needs of the learners (Clark, 2020).

Siborong-borong District was selected due to its high stunting prevalence and limited access to formal nutrition education. The findings of this study provide evidence that, even in resource-constrained settings, structured counseling delivered through either digital or analog media can lead to meaningful improvements in maternal knowledge. Given that 73% of participants had only completed secondary education, the success of both media underscores the importance of culturally appropriate and context-sensitive health communication strategies in public health programming.

Each media format possesses distinct strengths and limitations. Videos offer dynamic visual and auditory stimuli but may lack interactivity. Teaching aids, while more engaging and hands-on, require facilitator guidance and physical resources. Therefore, educators should tailor their media strategies based on target audience needs and program logistics. Combining both approaches in community health settings and leveraging local influencers such as midwives could enhance outreach and reinforce learning outcomes.

Limitations and Future Directions

This study has several limitations. The use of convenience sampling may introduce selection bias, limiting the generalizability of findings. Additionally, the pre-post design is susceptible to the Hawthorne effect, where participants alter behavior simply due to awareness of being observed. The one-month follow-up period may also be insufficient to capture long-term knowledge retention or behavioral change.

Future research should consider randomized controlled trials with larger sample sizes and longitudinal follow-up. Integrating both video and teaching aids into community health worker training modules may optimize knowledge dissemination. Moreover, culturally sensitive strategies involving local champions such as midwives or religious leaders could enhance participation and program sustainability in rural settings.

CONCLUSION

Both video media and teaching aids were found to be effective in improving maternal knowledge of the "Fill My Plate" nutrition program for stunting prevention, with no statistically significant difference between the two. In resource-limited settings like Siborong-borong, where literacy levels are low, either medium can be adopted based on local conditions.

Public health programs should select educational media based on available infrastructure and the literacy levels of the target population. It is recommended that these tools be integrated into routine community health activities such as posyandu (integrated health posts), with community health workers or midwives serving as key facilitators to enhance the reach and effectiveness of nutrition education.

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