

#### **Original Article**

Impact of nurturing care educational videos focusing on children with nutritional problems aged 6-23 months on mothers' knowledge and child growth

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## **ARTICLE INFORMATION**

Received: June 28, 2024 Revised: October 02, 2024 Accepted: October 07, 2024

## **K**EYWORDS

Educational Videos; Knowledge; Child Growth; Nutritional Problems

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## ABSTRACT

**Background:** The first 1,000 days are crucial for a child's development. Indonesia has limited research on responsive caregiving and early learning opportunities, especially for children with nutritional challenges. While studies have addressed general child nutrition, few have explored comprehensive nurturing care interventions. This gap underscores the need for further research. Educational videos, particularly animated ones, effectively capture attention and improve understanding, making them valuable for enhancing maternal knowledge and child growth.

**Purpose:** This study aimed to assess the impact of nurturing care educational videos on mothers' knowledge and child growth in children aged 6-23 months with nutritional challenges.

**Methods:** A quasi-experimental design with non-equivalent and untreated control groups was employed. Seventy-three mothers and their children aged 6-23 months, facing nutritional challenges, were recruited through consecutive sampling. The intervention group received nurturing care educational videos. Statistical analyses included dependent t-tests, independent t-tests, and repeated measures ANOVA.

**Results:** The intervention group showed significant improvements in nurturing care knowledge (p = 0.012), responsive caregiving (p = 0.018), and safety and security (p = 0.006). A significant difference in safety and security was observed between groups at posttest 1 (p = 0.020). Both groups exhibited significant increases in children's body weight and height: the intervention group (body weight, p = 0.005; body height, p < 0.001) and the control group (body weight, p < 0.001; body height, p < 0.001).

**Conclusion:** Nurturing care educational videos had a significant positive impact on enhancing mothers' knowledge and promoting child growth. Notable improvements were observed in nurturing care knowledge, responsive caregiving practices, and safety and security measures among caregivers exposed to the intervention.

## INTRODUCTION

Child growth issues remain a global concern, particularly during the first 1,000 days of life. According to the latest https://doi.org/10.30595/medisains.v22i3.22812

reports, only 29% of children worldwide receive a sufficiently diverse diet, leading to widespread malnutrition, including stunting, wasting, and underweight conditions.<sup>1,2</sup> Globally, the World Health Organization (WHO) estimates that 144 million children under the age of five suffer from

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stunting, with around 47 million affected by wasting.<sup>3,4</sup> In Indonesia, the 2022 Indonesian Nutritional Status Study (SSGI) highlighted that 21.6% of children under five were stunted, marking an improvement from 24.4% in 2021 but still far from the Government's target of reducing stunting to 14% by 2024.<sup>5</sup>

The SSGI identified Yogyakarta as one of the five provinces in Indonesia with acute nutritional problems (stunting < 20% and wasting  $\geq$  5%). Kulon Progo Regency in Yogyakarta still has a high percentage of children with nutritional issues. According to the Kulon Progo Health Office Website, the poverty rate in Kulon Progo was 16.39%, with 984 malnourished children in 2021.<sup>5</sup> The consequences of child malnutrition are far-reaching. Stunted children are at higher risk of cognitive impairments, diminished educational attainment, and reduced economic productivity in adulthood.<sup>6,7</sup> These long-term impacts reinforce the urgency of addressing malnutrition during early childhood, particularly in regions like Kulon Progo Regency, Yogyakarta, where poverty and poor nutritional practices persist.

To reduce the prevalence of nutritional problems, WHO recommends a nurturing care approach for children with nutritional issues, consisting of four components: responsive caregiving, early learning opportunities, safety and security, and caregiver well-being.<sup>8–11</sup> Several studies have examined the interventions to reduce child malnutrition. For instance, a study has focused on improving maternal knowledge of feeding practices through various educational methods.<sup>12</sup> Other studies on video-based education have shown positive outcomes in improving mothers' knowledge, attitudes, and feeding practices. <sup>13–16</sup>

Despite these efforts, gaps still need to be addressed in the application of nurturing care, particularly in Indonesia, where data on responsive caregiving and early learning opportunities are limited. While most interventions focus on nutrition and health, there needs to be more emphasis on holistic approaches that integrate all components of nurturing care, including caregiver well-being and responsive caregiving.4,17 This research seeks to address this gap by employing the nurturing care framework as a foundation for educational interventions targeting mothers of children aged 6-23 months with nutritional problems. This study explored how educational videos can improve maternal knowledge and support child growth in nutritionally vulnerable populations by integrating all nurturing care components-responsive caregiving, early learning, safety, and caregiver well-being-into a single intervention.

## METHOD

#### Study Design

This study employs a quasi-experimental design with a control group and pretest-posttest.

#### Setting and Respondent

This study was conducted at the Kalibawang Health Center and Samigaluh Health Center 1. Mothers and children aged 6-23 months were the population in this study. The number of samples used in this study was 73 mothers and children divided into 41 people in the intervention group and 32 in the control group. The sample selection criteria include (1) inclusion criteria: mothers who have children aged 6-23 months who are diagnosed with stunting and are willing to participate by signing an informed consent form, and (2) exclusion criteria: individuals other than mothers (e.g., caregivers, grandparents, fathers, other family members, or siblings) and children with congenital diseases. The sampling technique used in this study used consecutive sampling.

#### The Variable, Instrument, and Measurement

Variable in this study include the mothers' knowledge regarding nurturing care covering aspects such as responsive caregiving, early learning opportunities, safety and security, and caregiver support as well as the growth of their children, measured in terms of weight and height/length.

The study utilized a questionnaire and growth measurement tools. The questionnaire, administered via Google Forms to 73 mothers of children aged 6-23 months with nutritional issues, assessed maternal knowledge of nurturing care. After validity testing, it was refined from 44 to 39 questions, using the Guttman scale for scoring (1 for correct, 0 for incorrect), with higher scores indicating greater knowledge. Reliability was confirmed with a KR-20 value of 0.736. Child growth was measured using digital scales for weight and a length board for height. The mothers' knowledge data was collected through the questionnaire, while the growth data of the children, including weight and length/height measurements, was gathered during three phases: before, during, and after the intervention.<sup>19</sup>

# Nutritional-focused Nurturing Care Video Development

Developing nurturing care educational videos for children with nutritional problems involves pre-production, production, and post-production. The pre-production stage includes developing the video concept, gathering video references, scriptwriting, creating the storyboard, and assembling other necessary tools. During the production stage, the team prepares and creates nurturing care videos focusing on children with nutritional issues, including infant and child feeding and the growth and development of children aged 6-23 months. For this stage, the researchers collaborate with INAHEALTH, with the INAHEALTH team handling video production and the researchers providing the voice-over. Post-production involves editing the videos to ensure they meet the desired quality and educational standards (Table 1).

Video	Topics Co	overed	Dura	tion
Nutritional Problems				
lable1. Outline of Nurt	uring Care	Videos for	Children	with

Video	Topics Covered	Duration
Category		
Growth and	Growth and development	4 minutes
development of	including differences.	20
children aged	Growth and development	seconds
6-23 months	related to child nutrition.	
	Common issues in children	
	(wasting, underweight,	
	stunting, overweight).	
	Utilization of Maternal and	
	Child Health (MCH) book.	
Nurturing care	Explanation of nurturing care	5 minutes
for children with	for children with nutritional	
nutritional	problems.	
problems	Explanation of nurturing care	
	components for children with	
	nutritional problems including	
	responsive caregiving, early	
	learning opportunities, safety	
	and security, caregiver	
	support with examples for	
	each component.	
Infants and	ICF components:	5 minutes
Children	breastfeeding and	
Feeding (ICF)	complementary feeding.	
	Breastfeeding.	
	Complementary feeding	
	components: timely,	
	adequate, safe, and correct	
	feeding practices.	
	Correct feeding practices	
	using basic feeding rules.	

#### **Experimental Procedure**

Respondents were grouped into two categories: intervention and control groups. Before the intervention, all children underwent initial measurements of weight and height/length as a pretest. Mothers in the intervention group received three educational videos focusing on nutrition and nurturing care for children with malnutrition, covering four specific domains, with each video lasting approximately 5–7 minutes. Meanwhile, mothers in the control group were provided with six general nurturing care videos based on the five components of the Nurturing Care Framework (NCF).<sup>8</sup> each with a similar duration of 5–7 minutes.

The data collection process was conducted in three phases. During the initial phase, researchers measured children's weight and height/length as baseline data. Subsequently, educational videos were distributed to the respective groups via WhatsApp, with weekly reminders sent every Saturday. After the educational sessions, respondents completed the first posttest questionnaire to evaluate their understanding of the material provided. One month later, researchers conducted follow-up measurements of children's weight and height/length and administered a second posttest questionnaire to assess the improvement in mothers' knowledge.

#### Data Analysis

Demographic variables were summarized using percentages for categorical data and mean with standard

deviations for continuous variables. The Kolmogorov-Smirnov test confirmed normal data distribution for continuous variables (p>0.05). Inferential analysis was employed to evaluate the effects of video education on mothers' knowledge and changes in height/length and weight of children aged 6-23 months with nutritional problems. The analysis included dependent t-tests, independent t-tests for comparing groups, and repeated measures ANOVA for examining changes over time within groups. A significance level of p<0.05 was used to determine statistical significance.<sup>20</sup>

#### Ethical Consideration

All mothers provided written informed consent, adhering to research ethics principles, including respect for human dignity, respect for privacy and confidentiality, respect for justice in inclusiveness, and balancing harms and benefits. This research obtained ethical clearance on November 27, 2023, from the Health Research Ethics Committee (MHREC) of the Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, with Ethics Approval Number: KE/FK/1853/2023.

#### RESULTS

#### Participants Characteristics

Table 2 provides valuable insights into the demographic characteristics of participants, helping to contextualize the potential influences on the study's outcomes. The data reveal a fairly similar age distribution among the children in both the intervention and control groups, with the mean ages being almost identical, suggesting that both groups are well-matched in terms of the children's developmental stages. However, the intervention group has more male children (70.7%). In contrast, the control group has an equal distribution of male and female children, which could slightly influence caregiving dynamics based on gender expectations.

Regarding the mothers, the age distribution differs between the two groups. The intervention group has a higher mean age (31.39 years) than the control group (28.78 years), with a noticeable concentration of mothers aged 30-34 in the intervention group. This age difference might suggest that the intervention group has slightly more experienced mothers, which could influence their engagement with the educational materials and caregiving practices. Additionally, most mothers in the intervention group are housewives, while the control group has a slightly higher percentage of working mothers (15.6%). This distinction in employment status may reflect different time availability and opportunities to apply what is learned from the intervention, potentially affecting the study's outcomes. Educational attainment in both groups is relatively similar, with most mothers having completed senior high school.

This educational background suggests that most participants will likely understand and benefit from the educational videos, which require basic literacy and comprehension. A small portion of participants in both groups have higher education, which could enhance their ability to process and apply the information presented in the videos. Family size shows a consistent pattern across both groups, with most families having two children. This homogeneity suggests that the caregiving demands related to the number of children are fairly balanced between the groups. However, income levels present a noticeable difference: a higher percentage of families in the intervention group earn less than or equal to the regional minimum wage (68.3%) compared to the control group (53.1%). This income disparity might influence the resources available to families, particularly regarding nutrition and caregiving materials, which could further intervention.

These demographic characteristics provide a solid foundation for interpreting the study's results. The relatively similar distributions between the two groups indicate that the intervention's impact is unlikely to be skewed by major differences in participant backgrounds. However, gender balance, maternal employment, and income levels could influence the outcomes.

Table 2. Participants Characteristics (n=73)

Intervention	Control Group
Group (n=41)	(n=32)
16.46±4.79	16.59±4.74
7-23	7-23
12 (29.3%)	16 (50%)
29 (70.7%)	16 (50.0%)
31.39±5.14	28.78±5.06
20-42	20-44
40 (97.6%)	27 (84.4%)
1 (2.4%)	5 (15.6%)
· · ·	, , ,
1 (2.4%)	1 (3.1%)
10 24.4 (%)	9 (28.1%)
28 (68.3%)	19 (59.4%)
2 (4.9%)	2 (9.4%)
· · ·	, ,
9 (22.0%)	11 (34.4%)
26 (63.4%)	19 (59.4%)
6 (Ì4.6%)	1 (3.1%)
0 (0.0%)	1 (3.1%)
· · /	· /
28 (68.3%)	17 (53.1%)
13 (31.7%)	15 (46.9%)
	Intervention Group (n=41) $16.46\pm4.79$ 7-23 12 (29.3%) 29 (70.7%) $31.39\pm5.14$ 20-42 40 (97.6%) 1 (2.4%) 1 (2.4%) 28 (68.3%) 0 (0.0%) 28 (68.3%) 1 (3.1.7%) (2.1.1%)

Exp: Regional minimum wage (RMW)

## Impact of Nurturing Care Video Intervention on Maternal Knowledge and Children Growth

The results outlined in Table 3 highlight the mixed impact of the intervention across various domains of maternal knowledge. In nurturing care knowledge, the intervention group demonstrated a significant and sustained improvement from pretest to posttest 2, indicating that the educational videos effectively enhanced mothers' understanding of nurturing care practices. In contrast, the control group showed only slight, non-significant

122

improvements, emphasizing the critical role of the intervention in driving knowledge gains. Similarly, the intervention significantly affected responsive caregiving, where mothers in the intervention group exhibited notable improvements, particularly in the immediate posttest phase. However, a slight decline in scores by posttest 2 suggests that while the videos initially had a strong impact, ongoing support may be needed to maintain these gains over time. The control group did not show significant changes in this area, underscoring the intervention's effectiveness in promoting better caregiving practices.

In the domain of opportunities for early learning, neither group showed significant improvements, implying that this aspect of the intervention may have been less effective or that mothers already possessed a baseline level of knowledge in this area. This suggests that the content related to early learning may need to be strengthened in future interventions. However, the safety and security domain showed a marked improvement in the intervention group, with significant increases in scores from pretest to posttest 2. This indicates that the videos successfully raised awareness and enhanced knowledge of child safety and security practices, with a notable difference observed between the intervention and control groups in posttest 1.

Finally, no significant improvements were observed in supportive caregiver well-being in either group. This outcome suggests that the intervention may not have adequately addressed factors related to caregiver wellbeing or that these aspects require a longer period to reflect measurable change. Given the lack of significant differences between groups in this domain, it may be beneficial to incorporate additional resources or targeted content to support caregivers' well-being in future interventions better. Overall, the results demonstrate the effectiveness of the intervention in improving key areas of maternal caregiving knowledge, particularly in nurturing care, responsive caregiving, and child safety, while highlighting areas for further development, such as early learning opportunities and caregiver well-being.

Table 4 illustrates the positive impact of the intervention on children's growth, particularly in weight and height, over four weeks. Both the intervention and control groups exhibited significant increases in body weight and height during this period, suggesting that overall growth was achieved in both groups, regardless of the intervention. In terms of body weight, the intervention group experienced a modest but statistically significant increase in weight, indicating that the educational intervention may have supported better caregiving practices that contributed to growth. However, the control group also showed a significant increase in body weight, which suggests that other factors-such as natural growth patterns, improvements in nutrition, or routine healthcare-may have contributed to this increase. Importantly, there were no significant differences in body weight between the two groups at any point, implying that while both groups improved, the intervention did not lead to a markedly superior outcome in terms of weight gain compared to the control group.

#### Table 3. Impact of Intervention on Maternal Knowledge (n=73)

Variable	Group	Pretest	Posttest 1 (after intervention	Posttest 2 (after week 4)	p-value <sup>a</sup>
			session)		
Nurturing care	Intervention	25.53±4.96	27.81±4.41	28.75±3.87	0.012*
knowledge	Control	24.68±4.32	26.71±3.97	26.50±4.73	0.182
score	p-value <sup>b</sup>	0.432	0.366	0.067	
Responsive	Intervention	7.71±2.06	9.12±1.56	8.50±2.22	0.018*
caregiving	Control	8.46±2.04	8.81±1.87	9.28±1.81	0.553
	p-value <sup>b</sup>	0.120	0.518	0.153	
Opportunities	Intervention	4.87±1.28	5.06±1.29	5.06±1.29	0.873
for early	Control	4.90±1.42	5.15±1.08	5.28±1.34	0.464
learning	p-value <sup>b</sup>	0.923	0.768	0.519	
Safety and	Intervention	7.78±2.69	9.25±1.96	9.40±2.44	0.006*
security	Control	7.46±1.83	8.00±2.10	8.25±2.67	0.314
	p-value <sup>b</sup>	0.623	0.020*	0.061	
Supportive	Intervention	4.40±1.07	4.68±1.02	4.81±0.82	0.414
caregiver well-	Control	4.59±0.94	4.43±1.21	4.53±1.13	0.870
being	p-value <sup>b</sup>	0.363	0.397	0.247	

Exp: a=Repeated measures ANOVA with Bonferroni adjustment was performed, b=Independent t-test was performed, \*Significant at p<0.05

 Table 4. Impact of Intervention on Children Growth (n=73)

Variable	Group	Baseline	Posttest	p-value <sup>a</sup>
			after week 4	
Body weight (kg)	Intervention	8.02±1.07	8.15±1.04	0.005*
	Control	8.15±0.92	8.35±0.91	<0.001*
	p-value <sup>b</sup>	0.590	0.412	
Body height (cm)	Intervention	73.37±4.66	75.20±4.64	<0.001*
	Control	72.84±4.22	73.81±4.27	<0.001*
	p-value <sup>b</sup>	0.614	0.192	

Exp: a= Dependent t-test was performed, b=Independent t-test was performed, \*Significant at p<0.05, abbreviation: kg= kilogram, cm= centimeter

Similarly, for body height, both groups demonstrated significant growth over the four weeks, with the intervention group showing a slightly larger increase. This improvement in height could reflect the combined effects of better caregiving practices, as promoted by the intervention, and other underlying factors, such as overall health and nutrition. However, as with weight, there were no statistically significant differences between the intervention and control groups in terms of height at baseline or posttest, suggesting that while the intervention had a positive impact, it was not significantly more effective than the natural growth processes or other influences affecting the control group.

These findings suggest that while the intervention supported improvements in caregiving that contributed to children's growth, natural development and other factors in both groups played a substantial role in the observed increases in weight and height. The lack of significant differences between the two groups in weight and height indicates that while the intervention was beneficial, its impact on physical growth was comparable to the growth experienced in the control group.

## DISCUSSION

This study evaluated the impact of nurturing care educational videos on maternal knowledge and child growth among children aged 6-23 months with nutritional problems. The key findings showed that the intervention

significantly improved mothers' knowledge of nurturing care, particularly in responsive caregiving, safety, and security. The children's physical growth also showed significant improvement in the intervention and control groups, with the intervention group demonstrating more pronounced gains. These results suggest that targeted educational videos can enhance maternal knowledge and improve child growth outcomes.

Several studies support the findings of this research. Previous studies consistently show that video-based educational interventions are more effective than traditional materials like printed handouts in improving health-related knowledge and behavior changes.<sup>21</sup> For instance, a study on video counseling for child nutrition education showed significant improvements in mothers' knowledge and practices, similar to the findings of this study.<sup>14,19,22</sup>

Additionally, the current study aligns with previous research, showing that educational videos are valuable in improving knowledge and skills among caregivers, particularly in responsive caregiving. A study on mass media and video-based interventions has demonstrated positive effects on responsive caregiving practices, reducing caregiver anxiety and improving the quality of childcare.<sup>23</sup> Educational videos also reduce anxiety levels among caregivers compared to traditional printed materials, effectively addressing caregiver concerns and improving overall well-being.<sup>24</sup>

Moreover, the study demonstrated that educational videos significantly improve nurturing care safety and security scores by enhancing caregivers' knowledge and behaviors regarding providing children with a safe and secure environment. The nurturing care framework underscores the importance of safety and security for optimal child development.<sup>25</sup> Initiatives like the Brazilian Early Childhood Friendly Municipal Index (IMAPI) highlight nurturing care indicators, including safety and security, to promote early childhood development.26 Studies focusing on children's mental well-being in vulnerable settings emphasize responsive caregiving, safety, and security within the nurturing care framework.<sup>27</sup> Using educational videos can significantly improve caregiver knowledge and practices, contributing to young children's overall well-being and development.

Caregiver-child interactions and childcare quality are crucial for promoting children's social development.<sup>28</sup> Educational videos can increase parents' confidence in initiating weight-related conversations with their children.<sup>29</sup> Infant and young child-feeding videos have been shown to empower mothers and support their learning processes.<sup>30</sup> The role of nurturing care in child development is critical. Nurturing caregiving, characterized by affective warmth and responsive interactions, promotes child social initiatives.<sup>31</sup> Nurturing care fosters organized attachments and supports children's sense of self and behavioral regulation.<sup>32</sup>

Hence, some studies have indicated that while educational videos can improve knowledge, they may only sometimes lead to significant behavior changes in caregiving or nutritional practices, particularly in low-resource settings.<sup>33,34</sup> his points to a potential limitation in transferring knowledge to sustained behavioral change. Despite this, the current study showed that the videos did improve knowledge and child growth, suggesting that the intervention may have been particularly well-suited to this context.

One of this study's primary strengths is its focus on integrating the full spectrum of the WHO's nurturing care framework into a single intervention. This comprehensive approach addresses child nutrition, responsive caregiving, safety and security, and caregiver well-being, which are often neglected in similar studies. Additionally, educational videos proved an effective, accessible medium for improving maternal knowledge and promoting child growth in a real-world setting.

However, there are some limitations. The intervention's impact was measured over a relatively short period, making it difficult to assess long-term behavior changes or sustained improvements in child growth. Furthermore, while the intervention successfully enhanced knowledge, its ability to translate knowledge into lasting behavioral changes, especially in resource-limited settings, remains uncertain. Cultural factors and socioeconomic disparities within the study region could also have influenced the results, potentially limiting the broader applicability of the findings to different communities or regions

## **CONCLUSIONS AND RECOMMENDATION**

This study shows that educational videos on nurturing care effectively improve mothers' knowledge and support child growth among infants with nutritional challenges. The intervention boosted knowledge in nurturing care, responsive caregiving, and safety practices, leading to notable increases in children's weight and height in both intervention and control groups.

It is advised that policymakers incorporate video-based educational interventions into national maternal and child health policies, as they provide accessible, cost-effective information dissemination. Community health centers and home visits can integrate these videos to enhance caregiver engagement. Healthcare providers and community health workers can also use these videos in training and counseling sessions to improve caregivers' understanding of child nutrition, caregiving, and safety practices, promoting better health outcomes. Further research is recommended to evaluate the long-term effects and cultural adaptability of these interventions, with potential for region-specific video refinement to enhance impact on child health and development.

#### Acknowledgement

The authors thank the participants for their interest and generous participation in this study. The authors also thank Universitas Gadjah Mada for the supports provided. This study was funded by the Universitas Gadjah Mada through the Academic Excellence Improvement Program Number 7725/UN1.P.II/DitLit/PT.01.03/2023

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