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Original Article

## Effectiveness 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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### ABSTRACT

**Background:** The initial 1,000 days after birth are crucial for a child's growth and development. In Indonesia, there is insufficient data on responsive caregiving and limited implementation of early learning opportunities. Videos are an effective educational tool, particularly animated ones, which can capture attention, enhance focus, and improve understanding.

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

**Method:** The study utilized a quantitative method employing a quasi-experimental design with non-equivalent groups and an untreated control group. A total of 74 mothers and children aged 6-23 months, experiencing nutritional challenges, were recruited through consecutive sampling. The intervention group received 8 nurturing care educational videos. Statistical analyses included dependent t-tests, independent t-tests, and repeated measures ANOVA.

**Results:** The intervention group significantly improved in nurturing care knowledge ( $p = 0.012$ ), responsive caregiving ( $p = 0.018$ ), and safety and security ( $p = 0.006$ ). At posttest 1, there was a significant difference between groups for safety and security ( $p = 0.020$ ). Both groups also showed significant increases in children's body weight and height: intervention group (body weight,  $p = 0.005$ ; body height,  $p < 0.001$ ) and control group (body weight,  $p < 0.001$ ; body height,  $p < 0.001$ ).

**Conclusion:** significant positive impact of nurturing care educational videos on enhancing mothers' knowledge and promoting child growth among infants with nutritional challenges. The findings highlight notable improvements in nurturing care knowledge, responsive caregiving practices, and safety and security measures among caregivers exposed to the intervention.

### INTRODUCTION

<sup>23</sup>  
The first 1,000 days of a child's life, starting from birth, are a critical period for the child's growth and development<sup>1</sup>. One of the causes of growth issues is the failure in feeding practices due to mothers' lack of knowledge on proper feeding techniques<sup>2</sup>. According to UNICEF<sup>3,4</sup>, globally, only 29% of children receive a diverse diet. As children age, the incidence of malnutrition issues such as stunting, wasting, and underweight increases<sup>5</sup>. Factors contributing to stunting in children aged 6-23 months include the lack of exclusive breastfeeding, inappropriate complementary feeding, and inadequate maternal care<sup>6</sup>.

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Data from the 2022 Indonesian Nutritional Status Study (SSGI) show that the stunting rate in 2021 was 24.4%, which decreased to 21.6% in 2022<sup>7</sup>. However, this figure has not yet met the national government's target. The national target for stunting prevalence is set at 14% by 2024. The SSGI (2021) identified Yogyakarta as one of the five provinces in Indonesia with acute nutritional problems (stunting < 20% and wasting ≥ 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>7</sup>.

To reduce the prevalence of nutritional problems, WHO (2022) recommends a nurturing care approach for children with nutritional issues, consisting of four components<sup>8,9</sup>. The first component is "responsive caregiving," emphasizing a mother's ability to recognize her child's hunger and satiety signals and apply basic feeding rules. The second component, "early learning opportunities," involves the mother's ability to support the child's independence during feeding, maintain the child's focus, and encourage exploration with food. The third component, "safety and security," focuses on the caregiver's ability to maintain hygiene during food preparation, provide nutritious food, and create a comfortable environment. The final component is "caregiver well-being," which assesses the caregiver's emotional and mental health during feeding and the family's support for the mother<sup>8-11</sup>.

In Indonesia, the implementation of nurturing care mainly focuses on three components: child health, adequate nutrition, and child safety and health. There is limited data on responsive caregiving and minimal implementation of early learning opportunities, with only 18.36% of early childhood education presence<sup>4,12</sup>. A study in Brazil indicated that the Programa Criança Feliz (PCF) faced challenges in providing adequate nutrition due to food insecurity<sup>13</sup>.

One effective medium for education is video<sup>14</sup>. Animated videos can attract attention, focus, and understanding<sup>15</sup>. Previous research showed that groups receiving general nurturing care video education for healthy children experienced positive impacts on knowledge, attitudes, and practices compared to control groups not receiving video education<sup>16</sup>. Another study indicated that video counseling improved mothers' knowledge and attitudes about complementary feeding for children aged 6-24 months in Barane Environment, Baurung Village, Majene Regency<sup>17</sup>. Audio-visual education has been shown to impact mothers' knowledge about stunting prevention<sup>18</sup>. Combining the WHO's nurturing care components for children with nutritional issues can be an effective way to address childhood malnutrition. Therefore, this study aimed to assess the impact of nurturing care educational videos focusing on children with nutritional problems aged 6-23 months on mothers' knowledge and child growth.

## METHOD

### *Design*

This study employs a quantitative approach using a quasi-experimental design with nonequivalent groups and an untreated control group design with dependent pretest and posttest samples.

### *Sample and Settings*

The intervention group was situated in the service area of Puskesmas Kalibawang, while the control group was in the service area of Puskesmas Samigaluh 1. Using consecutive sampling, the study sample included mothers and children aged 6-23 months, with 41 mothers and 41 children in the intervention group, and 32 mothers and 32 children in the control group.

### *Instruments*

To evaluate the knowledge of mothers in nurturing their children, researchers employed a nurturing care knowledge questionnaire adapted from Hendriyani's (2020) study<sup>19</sup>. This questionnaire was administered to 73 mothers with children aged 6-23 months experiencing nutritional issues via Google Forms. It covers four components of nurturing care: responsive caregiving, early learning opportunities, safety and security, and caregiver support, initially comprising 44 questions, the questionnaire was refined to 39 after validity testing. Scores were assessed using the Guttman scale, where correct answers scored 1 and incorrect answers 0, indicating higher scores reflect greater knowledge. The instrument demonstrated good reliability with a KR-20 value of 0.736.

Additionally, tools for measuring child growth, including weight and height/length measurements, were employed. Different tools were used for these measurements; length for infants aged 6-23 months was measured using a length board, while weight was measured using digital weight scales. Measurements were conducted over three phases: before, during, and after the intervention.

The educational videos for the intervention group focused on nurturing care for children with nutritional problems, validated for both media and content. Meanwhile, the control group received general nurturing care education videos adapted from Hasanah's (2022) research<sup>20</sup>.

### Data Collection

Data collection took place from February 2024 to April 2024 in Kulonprogo, Yogyakarta. Mothers in the intervention group received specific nurturing care educational videos focused on children with malnutrition issues. Mothers in the control group received general nurturing care videos covering all five components. Measurements were taken before the intervention and again one month after the educational videos were provided.

### Nurturing Care Video Development

The development of nurturing care educational videos for children with nutritional problems involves several stages: 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. The post-production stage involves editing the videos to ensure they meet the desired quality and educational standards.

Table 1. Outline of Nurturing Care Videos for Children with Nutritional Problems

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

### Experimental Procedure

Respondents were grouped into two categories: the intervention group and the control group. Prior to receiving the video intervention, all children underwent measurements of weight and height/length. Mothers in the intervention group were provided with three nurturing care educational videos focused on nutritional problems, each lasting approximately 5-7 minutes. Conversely, mothers in the control group received six nurturing care educational videos, also about 5-7 minutes each.

Measurements of children's weight and height/length were conducted in three phases. The initial phase involved a pre-test conducted before the video intervention, during which researchers measured the children's weight and height/length. Subsequently, educational videos were shown to each group. Following the educational sessions, respondents were instructed to complete posttest 1 questionnaires. Every Saturday, researchers reminded respondents to watch the videos distributed via WhatsApp messages. After one month, researchers reconvened with respondents to conduct measurements of children's weight and height/length and to administer posttest 2 questionnaires regarding mothers' knowledge.

### Data Analysis

Demographic variables were summarized using percentages for categorical data and means 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.

## 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 Medical and 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

The table presents a detailed summary of the characteristics of participants in a study, divided into an intervention group of 41 participants and a control group of 32 participants. The ages of children in both groups range from 7 to 23 months, with the mean age being 16.46 months (SD = 4.79) in the intervention group and 16.59 months (SD = 4.74) in the control group. The intervention group consists of 29.3% females and 70.7% males, whereas the control group has an equal gender distribution of 50% females and 50% males.

For the mothers, ages range from 20 to 42 years in the intervention group and 20 to 44 years in the control group. The mean age of mothers in the intervention group is 31.39 years (SD = 5.14) and 30.78 years (SD = 5.06) in the control group. The age distribution varies, with a higher proportion of mothers aged 30-34 in the intervention group. Most mothers in the intervention group are housewives (97.6%), with only 2.4% working, while in the control group, 84.4% are housewives and 15.6% are working. Education levels show that the majority of mothers in the intervention group have senior high school education (68.3%), followed by junior high school (24.4%), higher education (4.9%), and elementary school (2.4%). The control group shows a similar distribution, with 59.4% having senior high school education, 28.1% junior high school, 9.4% higher education, and 3.1% elementary school.

Regarding the number of children, most families in the intervention group have two children (63.4%), followed by one child (22.0%) and three children (14.6%). The control group also predominantly has two children (59.4%), followed by one child (34.4%), and very few have three or four children. In terms of family income, 68.3% of families in the intervention group earn less than or equal to the regional minimum wage (RMW), while 31.7% earn above the RMW. In the control group, 53.1% of families have an income less than or equal to the RMW, and 46.9% earn above the RMW.

Table 2. Participants Characteristics (n=73)

Variable	Category	Intervention Group (n=41)		Control Group (n=32)	
		f	%	f	%
<b>Children</b>					
Age (month)	7	1	2.4	1	3.1
	8	1	2.4	0	0.0
	9	2	4.9	0	0.0
	10	1	2.4	2	6.3
	11	3	7.3	0	0.0
	12	3	7.3	6	18.8
	13	0	0.0	5	15.6
	14	5	12.2	0	0.0
	15	2	4.9	0	0.0
	16	3	7.3	1	3.1
	17	0	0.0	2	6.3
	18	2	4.9	0	0.0
	19	2	4.9	1	3.1
	20	7	17.1	3	9.4
21	2	4.9	6	18.8	
22	2	4.9	3	9.4	
23	5	12.2	2	6.3	
		M= 16.46 (SD= 4.79) Min-Max= 7-23		M= 16.59 (SD= 4.74) Min-Max= 7-23	
Gender	Female	12	29.3	16	50.0
	Male	29	70.7	16	50.0
<b>Mother</b>					
Age (Years)	20-24	5	12.2	5	15.6
	25-29	9	22.0	13	40.6
	30-34	15	36.6	12	37.5

	35-39	10	24.4	1	3.1
	>39	2	4.9	1	3.1
		M= 31.39 (SD= 5.14) Min-Max= 20-42		M= 28.78 (SD= 5.06) Min-Max= 20-44	
Occupation	Housewife	40	97.6	27	84.4
	Working	1	2.4	5	15.6
Education	Elementary	1	2.4	1	3.1
	Junior High School	10	24.4	9	28.1
	Senior High School	28	68.3	19	59.4
	Higher Education	2	4.9	2	9.4
Number of Children	1	9	22.0	11	34.4
	2	26	63.4	19	59.4
	3	6	14.6	1	3.1
	4	0	0.0	1	3.1
Family Income	≤ RMW	28	68.3	17	53.1
	> RMW	13	31.7	15	46.9

Note: RMW = Regional minimum wage per month

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

Table 17 outlined the effectiveness of an intervention on maternal knowledge across various domains, including nurturing care, responsive caregiving, opportunities for early learning, safety and security, and supportive caregiver well-being, for both an intervention group (41 participants) and a control group (32 participants). Measurements were taken at three points: pretest, posttest 1 (immediately after the intervention session), and posttest 2 (four weeks after the intervention).

For nurturing care knowledge, the intervention group showed significant improvement from a mean pretest score of 25.53 (SD = 4.96) to 27.81 (SD = 4.41) at posttest 1 and 28.75 (SD = 3.87) at posttest 2, with a p-value of 0.012. The control group also improved, but the change was not significant, with mean scores of 24.68 (SD = 4.32) at pretest, 26.71 (SD = 3.97) at posttest 1, and 26.50 (SD = 4.73) at posttest 2, with a p-value of 0.182. Comparisons between groups at each time point were not significant.

In terms of responsive caregiving, the intervention group again showed significant improvement, increasing from a mean pretest score of 7.71 (SD = 2.06) to 9.12 (SD = 1.56) at posttest 1 and 8.50 (SD = 2.22) at posttest 2, with a p-value of 0.018. The control group showed no significant change, with mean scores of 8.46 (SD = 2.04) at pretest, 8.81 (SD = 1.87) at posttest 1, and 9.28 (SD = 1.81) at posttest 2, with a p-value of 0.553. Comparisons between groups at each time point were also not significant.

For opportunities for early learning, neither group showed significant improvement. The intervention group's mean scores were 4.87 (SD = 1.28) at pretest, 5.06 (SD = 1.29) at posttest 1, and 5.06 (SD = 1.29) at posttest 2, with a p-value of 0.873. The control group had mean scores of 4.90 (SD = 1.42) at pretest, 5.15 (SD = 1.08) at posttest 1, and 5.28 (SD = 1.34) at posttest 2, with a p-value of 0.464. Comparisons between groups were not significant.

In the domain of safety and security, the intervention group showed significant improvement, with mean scores increasing from 7.78 (SD = 2.69) at pretest to 9.25 (SD = 1.96) at posttest 1 and 9.40 (SD = 2.44) at posttest 2, with a p-value of 0.006. The control group showed no significant change, with mean scores of 7.46 (SD = 1.83) at pretest, 8.00 (SD = 2.10) at posttest 1, and 8.25 (SD = 2.67) at posttest 2, with a p-value of 0.314. There was a significant difference between groups at posttest 1 ( $p = 0.020$ ), but not at pretest or posttest 2.

Finally, for supportive caregiver well-being, neither group showed significant improvement. The intervention group's mean scores were 4.40 (SD = 1.07) at pretest, 4.68 (SD = 1.02) at posttest 1, and 4.81 (SD = 0.82) at posttest 2, with a p-value of 0.414. The control group had mean scores of 4.59 (SD = 0.94) at pretest, 4.43 (SD = 1.21) at posttest 1, and 4.53 (SD = 1.13) at posttest 2, with a p-value of 0.870. Comparisons between groups were not significant at any time point.

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

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

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

Table 4 showed the effectiveness of an intervention on children's growth, measured by changes in body weight and height over a four-week period, for an intervention group of 41 participants and a control group of 32 participants. For body weight, the intervention group showed a significant increase from a baseline mean of 8.02 kg (SD = 1.07) to 8.15 kg (SD = 1.04) at the posttest, with a p-value of 0.005. The control group also showed a significant increase in body weight from a baseline mean of 8.15 kg (SD = 0.92) to 8.35 kg (SD = 0.91) at the posttest, with a p-value of less than 0.001. However, there were no significant differences in body weight between the groups at either baseline or posttest (p-values of 0.590 and 0.412, respectively).

For body height, the intervention group demonstrated a significant increase from a baseline mean of 73.37 cm (SD = 4.66) to 75.20 cm (SD = 4.64) at the posttest, with a p-value of less than 0.001. Similarly, the control group showed a significant increase in body height from a baseline mean of 72.84 cm (SD = 4.22) to 73.81 cm (SD = 4.27) at the posttest, also with a p-value of less than 0.001. There were no significant differences in body height between the groups at either baseline or posttest (p-values of 0.614 and 0.192, respectively).

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

Variable	Group	Baseline		Posttest after week 4		p-value <sup>a</sup>
		Mean	SD	Mean	SD	
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	

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

## DISCUSSION

This study aimed to evaluate the impact of nurturing care educational videos on mothers' knowledge and child growth in children aged 6-23 months with nutritional problems. The results showed significant improvements in the intervention group's nurturing care knowledge score from pretest to posttest 1 and posttest 2. Similarly, responsive caregiving scores increased significantly from pretest to posttest 1 and posttest 2. Safety and security scores also improved significantly across the same periods. Furthermore, both the intervention and control groups showed significant growth in children's body weight and height. The intervention group saw significant increases in both body weight and height, while the control group also exhibited significant gains.

Educational videos have proven effective in enhancing knowledge across various healthcare domains. Research indicates that educational videos are more effective than written materials in increasing knowledge and modifying health behaviors<sup>21</sup>. Specifically, nurturing care knowledge has been significantly improved through educational videos, as evidenced by increased understanding and knowledge levels<sup>16,20,22</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. Prior interventions involving mass media, educational video content, and counseling sessions have significantly enhanced responsive care practices<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 related to providing a safe and secure environment for children. 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<sup>26</sup>. 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>. By using educational videos, caregiver knowledge and practices can be significantly improved, contributing to the overall well-being and development of young children.

Educational videos significantly impact caregiver learning and child growth<sup>37</sup>. Video-based interventions have been effective in improving various aspects of child development. For example, nutrition and health videos displayed on mobile phones positively influenced community health workers' and mothers' learning and competence, leading to better child feeding and care practices<sup>28</sup>. Caregiver-child interactions and childcare quality are crucial for promoting children's social development<sup>29</sup>.

Video-based educational tools enhance parental self-efficacy and learning<sup>40</sup>. Educational videos can increase parents' confidence in initiating weight-related conversations with their children<sup>30</sup>. Infant and young child-feeding videos have been shown to empower mothers and support their learning processes<sup>31</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>32</sup>. Nurturing care also fosters organized attachments and supports children's sense of self and behavioral regulation<sup>33</sup>.

## CONCLUSIONS AND RECOMMENDATION

In conclusion, this study underscores the significant positive impact of nurturing care educational videos on enhancing mothers' knowledge<sup>6</sup> and promoting child growth among infants with nutritional challenges. The findings highlight notable improvements in nurturing care knowledge, responsive caregiving practices, and safety and security measures among caregivers exposed to the intervention. Moreover, both the intervention and control groups demonstrated substantial increases in children's body weight and height, emphasizing the broader benefits of educational interventions in early childhood health and development.

Based on these findings, it is recommended that healthcare and childcare programs integrate educational videos as effective tools for enhancing caregiver knowledge and practices. These videos can empower caregivers by providing accessible and engaging resources that improve their understanding of nurturing care principles and child development. Furthermore, policymakers and healthcare providers should consider incorporating video-based interventions into routine maternal and child health services, thereby fostering supportive environments that promote optimal growth and well-being for young children. Future research could explore the long-term effects of such interventions and further refine video content to address specific cultural and contextual factors influencing caregiver practices and child outcomes. By leveraging educational videos effectively, stakeholders can advance efforts in nurturing care and contribute to better health outcomes for vulnerable children worldwide.

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