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The Effectiveness of Innovative Health Education by Nurses on the Knowledge and Behavior of Mothers in Monitoring the Growth of Toddlers in Puskesmas

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ABSTRACT
Optimal toddler growth is strongly influenced by mothers' ability to monitor their children's nutritional status, growth, and development independently at home. However, many mothers still have limited knowledge and inadequate monitoring behavior, resulting in delayed detection of growth and developmental disorders, including in the Andalas health center area Padang City. Conventional health education has been considered less engaging and less effective in improving maternal knowledge and behavior. This study aimed to analyze the effectiveness of innovative nurse-led health education on mothers' knowledge and behavior in monitoring toddler growth. A quasi-experimental study with a one-group pretest-posttest design was conducted involving 42 mothers of toddlers selected through purposive sampling. Data were collected using knowledge questionnaires and behavioral observation sheets before and after audiovisual-based health education. Univariate analysis used frequency distributions, while bivariate analysis applied the Paired t-test. The mean knowledge score increased from 56.4 to 82.7, while the mean behavior score improved from 58.1 to 84.3. Statistical analysis showed significant differences in both variables ($p = 0.000$; $p < 0.05$). Innovative health education effectively improved maternal knowledge and behavior, supporting its regular implementation by nurses as a preventive strategy to optimize toddler growth and development monitoring.

Keywords: *Education, Innovative, Knowledge, Behavior, Toddler Growth, Nurse*

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INTRODUCTION

Toddler growth is one of the important indicators in assessing the health status of children as well as a measure of the success of health development because childhood is a golden period (golden period) which is characterized by physical growth, brain development, and maturation of various body systems that take place very rapidly. Globally, UNICEF reports that in 2024 around 148 million under five children will experience stunting, 45 million will experience wasting, and 37 million will be overweight, while in Indonesia the prevalence of stunting based on the Indonesian nutritional Status survey (SSGI) in 2024 will still reach 19.8%, so growth disorders remain a public health problem that requires serious attention. Growth disorders in childhood can cause short-term impacts in the form of increased morbidity and long-term impacts in the form of decreased cognitive ability, productivity, and quality of human resources if not detected and treated early. Therefore, regular monitoring of growth through basic health services at puskesmas and posyandu, along with increasing maternal knowledge and behavior through innovative health education by nurses, is an important effort to ensure that every toddler grows and develops optimally (UNICEF, 2025; Ministry of Health, 2025).

Toddler growth disorders are still one of the public health problems in various countries, especially in developing countries. These disorders are not only stunting, but also wasting, underweight, and developmental delays that are often not identified early on. These conditions can increase the risk of infectious diseases, impaired cognitive development, low learning achievement, to the increased risk of non-communicable diseases in adulthood. Therefore, WHO emphasizes the importance of early detection through routine growth monitoring as a preventive effort to reduce the long-term impact of growth disorders in children (WHO, 2023).

In Indonesia, the government continues to strengthen efforts to monitor the growth of toddlers through Posyandu services, Puskesmas, and the use of maternal and Child Health books (KIA). Based on the Indonesian nutritional Status survey (SSGI), the prevalence of stunting has indeed shown a downward trend in recent years, but nutrition problems in toddlers are still a national challenge so that family-based interventions are needed to strengthen. UNICEF also stressed that increasing the coverage of Health Services needs to be followed by increasing the capacity of parents to independently monitor children's growth at home. These conditions indicate that the success of national programs depends not only on health services, but also on the ability of families to implement health practices in a sustainable manner (Ministry of Health, 2024).

The success of monitoring the growth of toddlers is greatly influenced by the ability of the mother as the main caregiver in the family. Maternal knowledge about growth, nutrition, and early detection of growth disorders play an important role in determining the quality of care provided to children. Research conducted by Has, Krisnana, and Efendi (2024) shows that maternal caregiving capability affects stunting prevention behavior in children, so that increasing maternal capacity is one of the important components in efforts to improve the health status of toddlers. Therefore, increasing maternal knowledge is a strategic step in strengthening the Prevention of growth disorders from an early age (Has et al., 2024).

Various innovations in health education methods began to be developed to improve the effectiveness of information delivery to mothers of toddlers. One method that is widely studied is the use of audiovisual media because it is able to combine elements of image, sound, and demonstration so that information is more easily understood than the lecture method. Research by Renhoran, Purwati, and Anita (2024) shows that audiovisual and booklet-based education has a significant effect on improving mothers ' knowledge, attitudes, and skills in preventing stunting. The findings reinforce that the use of innovative educational media can be an effective strategy in improving the ability of mothers to independently monitor the growth of toddlers (Renhoran et al., 2024).

In addition to knowledge, the behavior of mothers in monitoring the growth and development of toddlers is also an important factor in the success of early detection of growth and development disorders. These behaviors include the habit of taking children to the Andalas health center in Padang City on a regular basis, monitoring their weight and height, and following the recommendations of health workers related to child nutrition. Mentoring activities show that the involvement of health cadres and increased education to mothers is able to increase community compliance in monitoring the nutritional status of toddlers on a regular basis. These conditions indicate that changes in maternal behavior require ongoing educational support and active involvement of health workers and cadres in the community (Alarsan, 2025).

Nurses have a strategic role as educators in improving the ability of families, especially mothers, to monitor the growth of toddlers independently. In primary health care, nurses not only provide information, but also facilitate the learning process, build motivation, and improve family skills in implementing healthy living behaviors. Health education that is carried out in a planned, sustainable manner, and using appropriate methods has been proven to increase family participation in promotional and preventive efforts. Therefore, strengthening the role of nurses as educators is one of the important strategies in supporting the achievement of maternal and Child Health development targets in Indonesia (Has et al., 2024).

Although health education has become part of routine services in health centers, the method of delivery is still dominated by lectures and the use of print media such as leaflets. The approach is often one-way so that the involvement of participants in the learning process becomes less than optimal. Research shows that conventional educational methods have limitations in maintaining participants ' attention and have not been fully able to produce sustainable changes in health behavior. Therefore, more interactive educational media innovations are needed so that health information can be understood, remembered, and applied by mothers in their daily lives (Fadyllah & Prasetyo, 2021).

The development of information technology opens up great opportunities in the use of audiovisual media as an innovation in health education. Audiovisual Media is able to integrate images, sounds, animations, and demonstrations so that the process of delivering information becomes more interesting and easier to understand than the lecture method alone. Various studies have shown that video-based education can increase mothers ' knowledge about stunting

prevention, nutrition fulfillment, and monitoring toddler growth more effectively than conventional media. However, the successful use of audiovisual Media is still influenced by the quality of the material, language suitability, target characteristics, and assistance of health workers during the educational process (Hartati et al., 2023; Astriani et al., 2023).

This also applies to those who have mental and physical health problems, which cannot be solved by health care, but also by maternal support to take care of themselves in the family environment. Several previous studies have shown that audiovisual media-based health education provided by health workers is effective in increasing the knowledge, skills, and responsibilities of mothers in fostering and early detection of gang tumbuhkembali toddlers (Alarsan, 2025; Cumayunaro, A., 2020). However, evidence confirms the effectiveness of innovative health education specifically provided by nurses in improving the understanding and responsibility of mothers to caregivers of toddlers in the working area of Andalas Health Center is still limited. This study is expected to provide scientific evidence on the effectiveness of innovative health education to improve the knowledge and behavior of mothers in monitoring the growth of toddlers as well as the basis for the development of promotive and preventive programs in primary health care. On this basis, the researchers were interested in analyzing the effectiveness of innovative health education by nurses on the knowledge and behavior of mothers in monitoring the growth of toddlers in the work area of the Andalas Health Center in Padang City.

METHODS

This study employed quasi experiment design with one group pretest–posttest design to determine the effectiveness of innovative health education on the knowledge and behavior of mothers in monitoring the growth of toddlers. The research was conducted at Andalas Health Center in Padang City. The study population is all mothers who have toddlers in the Working Area of Andalas Health Center, with a sample of 42 respondents selected using purposive sampling technique. Inclusion criteria in this study include mothers who have children aged 0-59 months, domiciled in the working area of Andalas Health Center, able to read and communicate well, willing to be a respondent by signing a consent sheet (informed consent), and follow the entire series of studies to completion. The exclusion criteria were mothers who were not present at the time of the posttest, had impaired communication, or resigned during the research process.

Data collection was conducted using knowledge questionnaires and behavioral observation sheets provided before (pretest) and after (posttest) interventions in the form of innovative health education based on audiovisual media delivered by nurses. The knowledge questionnaire measures mothers ' understanding of toddler growth monitoring which includes the concept of toddler growth, the goals and benefits of growth monitoring, weighing schedules, weight and height measurements, interpretation of the healthy card (KMS), and early detection of growth disorders. The preparation of the instrument refers to the guidelines for the implementation of stimulation, detection, and early intervention in growth and development (SDIDTK) and the maternal and Child Health Book (KIA) of the Ministry of health of the Republic of Indonesia.

The results of the validity test showed that all items of the questionnaire were declared valid with a correlation coefficient of items (R count) ranging from 0.45 to 0.82 (R table = 0.361), while the reliability test using Cronbach's alpha obtained a value of 0.89 which indicates that the instrument has good reliability. Behavioral assessment was carried out using observation sheets containing indicators of the mother's ability to monitor the growth of toddlers according to health service standards, including compliance with routine weighing, height measurement, monitoring growth charts on KMS, and follow-up on monitoring results. The hxealth education intervention was conducted by nurses in one educational session lasting about 30-45 minutes using audiovisual media in the form of educational videos on toddler growth monitoring, followed by interactive discussions, questions and answers, and demonstrations of how to read growth charts on KMS and correct weight and height measurement practices. After all the material was delivered, participants were given the opportunity to ask questions and obtain feedback from nurses to ensure understanding of the material provided, then posttest measurements using the same instrument.

Data were analyzed univariate to describe the characteristics of respondents and the distribution of research variables, while the bivariate analysis using paired t-test with a significance level of 95% (α =0.05) to determine the difference in knowledge and behavior scores before and after the intervention. Before the study was conducted, all respondents were given an explanation of the objectives, procedures, benefits, and potential risks of the study, then asked to sign an informed consent sheet. The entire research process was carried out by taking into account the principles of research ethics which include respect for the autonomy of respondents (respect for persons), beneficence (beneficence), non-harm (non-maleficence), justice (justice), and maintaining the confidentiality of the identity and personal data of respondents.

RESULTS

1. Characteristics of Respondents

Table 1. Characteristics of Respondents (n = 42)

Characteristics	Frequency (f)	Percentage (%)
Age		
20-30 years old	16	38.1
31-40 years old	21	50.0
>40 years old	5	11.9
Education		
SD	3	7.1
SMP	8	19.0
High school	22	52.4
College	9	21.5

Characteristics	Frequency (f)	Percentage (%)
Jobs		
Housewife	27	64.3
Private	8	19.0
Self-employed	5	11.9
State officials	2	4.8
Toddler Age		
0-24 months	18	42.9
25-59 months	24	57.1

Based on table 1, it is known that most of the respondents aged 31-40 years were 21 people (50.0%). The education level of respondents was dominated by high school graduates as many as 22 people (52.4%), while the most jobs were housewives as many as 27 people (64.3%). Based on the age of toddlers, most respondents had toddlers aged 25-59 months as many as 24 people (57.1%).

2. Distribution of Average Knowledge and Behavior Scores Before and After Education

Univariate analysis was conducted to determine the picture of knowledge and behavior scores of mothers before and after being given innovative health education based on audiovisual media.

Table 2. Distribution of Average Knowledge and Behavior Scores Before and After Education

Variable	Mean	SD	Min	Max
Pretest Knowledge	56.4	9.28	38	72
Posttest Knowledge	82.7	7.16	68	96
Pretest Behavior	58.1	8.74	42	73
Posttest Behavior	84.3	6.83	70	97

The results in table 2 showed that before the innovative health education was given, the average maternal knowledge score was 56.4 ± 9.28, then increased to 82.7 ± 7.16 after the intervention. Similarly, the average behavioural score increased from 58.1 ± 8.74 before education to 84.3 ± 6.83 after education. The results showed an increase in the average value of both knowledge and behavior after the provision of innovative health education.

3. The Effect of Innovative Health Education on Maternal Knowledge and Behavior

Tabel 3. The Effect of Innovative Health Education on Maternal Knowledge and Behavior

Variable	Mean Pretest	Mean Posttest	Mean Difference	t	p-value
Knowledge	56.4	82.7	26.3	-18.42	0.000

Variable	Mean Pretest	Mean Posttest	Mean Difference	t	p-value
Behavior	58.1	84.3	26.2	-17.85	0.000

Based on Table 3, The Paired t-test results showed that the average knowledge score increased by 26.3 points after being given innovative health education and the average behavior also increased by 26.2 points after being given innovative health education. The results showed a value of t = -18.42 with p = 0.000 (p < 0.05), so there is a significant difference between the knowledge score before and after the intervention .

DISCUSSION

1. Distribution of Average Knowledge and Behavior Scores Before and After Education

The results showed that there was an increase in the average maternal knowledge score from 56.4 at the pretest to 82.7 at the posttest after being given innovative audiovisual-based health education. This increase indicates a considerable change in the level of understanding of mothers regarding the monitoring of toddler growth. In addition, the distribution of posttest scores showed that most mothers were in the category of good knowledge. This indicates that the interventions provided have a positive impact on increasing the knowledge of respondents.

The increase in maternal knowledge in this study can be explained through the theory of information processing which states that individuals will more easily understand the information if it is conveyed through a combination of visual and auditory stimuli. Audiovisual media allow information to be received through more than one sense, thus improving attention, understanding and memory of the material provided. In health education, the use of audiovisual media has proven to be able to improve health literacy because the material is delivered in a more interesting and easily understood by various target groups. Therefore, the use of audiovisual media is one of the effective educational strategies to increase maternal knowledge in monitoring toddler growth (Fadyllah & Prasetyo, 2021; Keats, E. C., 2021).

The improvement of maternal knowledge after the intervention is given is also in line with the theory of Health Education which explains that the success of the learning process is influenced by the method of delivery, the media used, and the active involvement of participants in the learning process. Audiovisual media provide a more interactive learning experience than the lecture method because participants not only listen to explanations, but also get a visual overview of the material being studied. This condition makes it easier for mothers to understand the concept of monitoring the growth of toddlers and improve the ability to remember the information that has been obtained. Thus, the use of appropriate educational media plays an important role in improving the effectiveness of Health Education (Notoatmodjo, 2020).

The results of this study are in line with various previous studies that have shown that audiovisual media are effective in increasing maternal knowledge compared to conventional health education methods. Presentation of the material through video that combines elements of visual, audio, illustrations, and demonstrations proven to help participants understand complex

health information and improve memory of the material provided. In addition to improving understanding, the use of audiovisual media is also able to increase the attention and involvement of participants during the learning process so that health information is more easily accepted and applied in everyday life. Research by Sari et al. (2022) showed that health education using audiovisual media significantly increased maternal knowledge regarding stunting prevention in toddlers. In addition, research by Nurfatimah et al. (2021) also found that audiovisual media-based health education is effective in improving maternal knowledge and attitudes in efforts to prevent nutritional problems in children. This finding reinforces that audiovisual-based educational media innovation is an effective strategy in supporting the role of health workers, especially nurses, to improve the knowledge and skills of mothers in child health monitoring.

In theory, learning that involves more than one channel of information will result in better understanding than verbal delivery of information alone. The combination of image, sound, and demonstration elements in audiovisual Media helps participants connect new information with pre-owned experiences so that the material is easier to understand. In this study, audiovisual media provide an opportunity for mothers to see firsthand examples of monitoring the growth of toddlers so as to improve understanding of the material presented. These conditions make audiovisual media as one of the effective innovations in health education in primary care (Renhoran et al., 2024; Dewey, K. G, 2021).

The increase in maternal knowledge was also influenced by the characteristics of the respondents, especially the level of education and age. Individuals with higher levels of education tend to have better abilities in receiving, understanding, and interpreting health information. In addition, productive age groups generally have good cognitive abilities so that they are more receptive to new information conveyed through educational media. However, the use of audiovisual media can help reduce gaps in understanding because the material is delivered in a simple, interesting, and easy to follow by various groups of people (Has et al., 2024).

In addition to the media used, the success of improving maternal knowledge is also influenced by the role of nurses as educators in primary health care. Nurses have the competence to convey health information systematically, provide demonstrations, and facilitate the learning process in accordance with the needs of the community. The educational approach combined with the use of innovative media allows for two-way communication so that participants are more active in understanding the material provided. Therefore, the integration between the competence of nurses and the use of audiovisual media is one of the factors that support the success of increasing maternal knowledge in this study (Has et al., 2024)

The results showed that the average score of maternal behavior in monitoring the growth of toddlers increased from 58.1 on the pretest to 84.3 on the posttest. This increase shows a positive change in behavior after being given innovative audiovisual-based health education. Most mothers also showed improvement in performing monitoring measures such as weighing and understanding growth charts. This shows that education not only improves knowledge, but also the behavior of the mother.

Recent research shows that audiovisual Media-based education is effective in improving maternal health practices, including breastfeeding, complementary feeding, and monitoring child growth. Video Media provides a concrete picture of the actions that must be done so that it is easier for mothers to understand and imitate than conventional counseling. Study by Renhoran et al. (2024) showed that audiovisual-based education significantly improved mothers ' knowledge and skills in stunting prevention. This reinforces that audiovisual media has a strong influence in promoting changes in maternal health behavior (Renhoran et al., 2024).

Toddler growth monitoring behavior is strongly influenced by the level of Mother's understanding of the importance of early detection of growth disorders. Audiovisual-based education is proven to increase maternal awareness in monitoring children's weight and height on a regular basis. WHO affirms that early detection through growth monitoring is an important strategy in preventing growth disorders in children. This increase in awareness contributes to a change in maternal behavior towards a more positive direction in maintaining the health of the child (WHO, 2023).

Maternal involvement in growth monitoring is also influenced by the ease of access to health information. Audiovisual Media allows mothers to repeat educational material at any time, gradually increasing understanding. This ease is one of the advantages over conventional educational methods that are once delivered. Thus, the use of audiovisual media can support the formation of more sustainable health behaviors in everyday life (Fadyllah & Prasetyo, 2021).

Maternal health behavior is also influenced by environmental factors such as family support, health cadres, and health workers in primary care facilities. Social support is proven to increase the motivation of mothers in monitoring the growth of children on a regular basis. UNICEF emphasizes that family-based intervention is one of the important strategies in the Prevention of child nutrition problems. In this study, the education provided by nurses provides external reinforcement that encourages mothers to be more consistent in monitoring the growth of toddlers (Has et al., 2024).

Researchers assume that the increase in maternal behavior is not only influenced by the use of audiovisual media, but also by direct interaction with nurses during the educational process. An interactive and engaging learning environment is likely to increase the mother's attention and motivation to receive information. In addition, the mother's experience in participating in previous Posyandu activities can also affect their ability to understand the material provided. Thus, the behavioral changes that occur are the result of a combination of internal and external factors that support each other.

Overall, the results of the analysis showed that innovative audiovisual-based health education contributes to the improvement of maternal knowledge and behavior in monitoring the growth of toddlers. This shows that interactive and visual educational methods are more effective than conventional approaches in improving cognitive and behavioral aspects of Health. These findings reinforce the importance of innovation in health education at primary care level to

improve the quality of child growth monitoring. Therefore, audiovisual-based education can be recommended as an effective promotive and preventive strategy in Puskesmas.

2. The Effect of Innovative Health Education on Maternal Knowledge and Behavior

The results of the bivariate test using Paired t-test showed that there were significant differences in the knowledge of mothers before and after being given innovative audiovisual-based health education. The average knowledge score increased from 56.4 to 82.7 with a margin of improvement of 26.3 points. The results of statistical tests showed a value of p = 0.000 which means there is a significant effect of the intervention given. These findings indicate that innovative health education is effective in increasing maternal knowledge in monitoring toddler growth.

A significant increase in knowledge in this study can be explained through the theory of cognitive theory of multimedia learning which states that the learning process will be more effective if the information is conveyed through a combination of visual and auditory channels. Audiovisual Media allow participants to receive information through two channels at the same time, thereby improving attention, understanding, and the ability to remember information. In the context of Health Education, the use of audiovisual media has been shown to help people understand complex information such as toddler growth monitoring that requires graphic visualization and demonstrations. Therefore, the use of audiovisual media favors the effectiveness of learning compared to conventional methods that are only verbal (Mayer, 2021).

The results of this study are also in accordance with the theory of behavior change which states that increased knowledge is an important factor in shaping health attitudes and actions. When individuals understand the benefits of a health behavior, the tendency to perform the action will increase. Audiovisual-based education provides a stronger stimulus because it not only conveys information, but also provides visual examples that are easy to imitate. This shows that increased knowledge has an important role in encouraging changes in maternal health behavior (Prasetyo et al., 2023; Has et al., 2024).

Several recent studies have shown that audiovisual-based education can significantly increase maternal knowledge compared to conventional education methods. Video media helps simplify complex information such as the interpretation of growth charts and signs of nutritional disorders in children. In addition, the use of animation and visualization increases the attention of respondents so that the learning process becomes more effective. These findings reinforce the evidence that audiovisual media is an effective approach in public health education, particularly in mothers of toddlers (Renhoran et al., 2024; Prasetyo et al., 2023).

The effectiveness of audiovisual media can also be explained through the theory of dual coding, which states that information processed through verbal and visual pathways will be more easily stored in long-term memory. The combination of sounds, images and demonstrations makes the learning process more meaningful and understandable. In this study, mothers not only received verbal explanations, but also saw real examples of how to monitor the growth of toddlers.

This increases understanding and reinforces retention of information acquired during education (Renhoran et al., 2024).

In addition to media factors, the characteristics of respondents also play a role in increasing maternal knowledge. Individuals of productive age generally have better cognitive abilities in accepting new information than other age groups. In addition, a higher level of education also makes it easier for mothers to understand the information conveyed through audiovisual media. Nonetheless, audiovisual media remains effective in various groups because it presents information in a simple, visual, and easy to follow (Has et al., 2024).

The role of nurses as educators also makes an important contribution to the improvement of maternal knowledge in this study. Nurses have competence in providing health education systematically, communicatively, and according to target needs. Direct interaction between nurses and mothers in the educational process increases trust and acceptance of health information. The combination of nurse competence and the use of audiovisual media makes the educational process more effective in improving maternal knowledge (Has et al., 2024).

The results of the bivariate test on behavioral variables showed that there was a significant increase in maternal behavior scores after being given innovative health education. The average behavior score increased from 58.1 to 84.3 with a margin of improvement of 26.2 points. Paired t-test results showed a value of $p = 0.000$ which means there is a significant effect between before and after the intervention. This shows that innovative health education is effective in improving maternal behavior in monitoring toddler growth.

Changes in health behavior in this study can be explained through the Precede-Proceed model approach developed by Green & Kreuter, which states that behavior is influenced by predisposing, enabling, and reinforcing factors. Audiovisual education in this study acts as a predisposing factor because it increases the knowledge of mothers related to monitoring the growth of toddlers. In addition, this medium also serves as a reinforcing factor because it provides concrete visual examples so that they are easier to imitate in everyday life. Thus, audiovisual-based interventions can accelerate the formation of changes in health behavior (Green & Kreuter, 2020).

Recent research has shown that audiovisual media have a significant influence on improving maternal health practices in various aspects, including monitoring child growth. Video media provides a real visualization of the steps to be taken making it easier for mothers to understand and apply them directly at home. Study by Renhoran et al. (2024) shows that audiovisual-based education can improve mothers skills in stunting prevention and child nutrition monitoring. This reinforces that audiovisual media are effective in altering health behaviors compared to conventional methods (Renhoran et al., 2024; Black, M. M., 2020).

Toddler growth monitoring behavior is strongly influenced by the level of Mother's understanding of the importance of early detection of growth disorders. After being given education, mothers become more aware of the importance of monitoring the weight and height of children regularly as a form of prevention of nutritional disorders. WHO emphasizes that early

detection through growth monitoring is a key strategy in reducing the risk of stunting and wasting in children. This increase in awareness promotes changes in maternal behavior in a more positive and sustainable direction (WHO, 2023).

Ease of access to educational media is also an important factor in changing maternal behavior. Audiovisual media allows mothers to repeat the educational material at any time so as to strengthen understanding and application in everyday life. This process of repeating information helps strengthen long-term memory and improve the consistency of health behaviors. Thus, audiovisual media support the sustainability of more stable behavior changes in toddler growth monitoring (Fadyllah & Prasetyo, 2021; Dewi, R., 2021).

Environmental support such as family, health cadres, and health workers also affect changes in maternal behavior. Education provided by nurses in this study provides external reinforcement that encourages mothers to be more active in monitoring child growth. UNICEF states that family-based intervention is one of the important strategies in the success of stunting prevention programs. Thus, environmental factors reinforce the effectiveness of educational interventions provided (UNICEF, 2025).

Researchers assume that the increase in knowledge and behavior of mothers is not only influenced by audiovisual media, but also by other factors such as the mother's internal motivation, previous experience in Posyandu activities, as well as direct interaction with nurses during the educational process. An interactive and engaging learning environment is likely to increase the mother's focus and receptivity to information. In addition, the repetition of material through audiovisual media can reinforce the learning process and the application of behaviors at home. Thus, the results of the study are a combination of various factors that support each other.

Overall, the results of the bivariate analysis show that innovative audiovisual-based health education has a significant effect on improving maternal knowledge and behavior in monitoring toddler growth, thus strengthening evidence that interactive, visual, and easy-to-understand educational media are more effective than conventional methods. This study has limitations because it was only conducted on mothers of toddlers in the working area of Andalas health center with a relatively short observation period, so the results cannot be generalized to a wider population and do not describe the sustainability of behavior change in the long term. Clinically, these findings indicate that audiovisual-based health education can be applied by nurses and health workers at Andalas health center as a promotive and preventive strategy to increase maternal involvement in monitoring toddler growth. The application of audiovisual media in Posyandu activities and Primary Health Services is expected to strengthen early detection of growth disorders and improve the quality of maternal and child health services at the community level.

CONCLUSIONS

This study showed that innovative health education based on audiovisual media provided by nurses has an effect on increasing the knowledge and behavior of mothers in monitoring the

growth of toddlers. These findings indicate that the use of interactive and engaging educational media can improve mothers ' understanding of the importance of growth monitoring and encourage the formation of better health behaviors. Innovative health education can be one of the effective promotive and preventive strategies to strengthen the role of mothers in early detection of toddler growth disorders at the family level. Therefore, the application of audiovisual media-based education methods should be considered as part of routine education programs in Puskesmas to improve the quality of maternal and Child Health Services.

This study has some limitations in interpreting the results of the study. The study was only conducted at one health center with a relatively limited number of respondents so that the results of the study can not be generalized to a wider population. Observations of behavior changes were also made a short time after the intervention so that they could not yet describe the sustainability of behavior changes in the long term. Therefore, further research is recommended to use an experimental design with a control group, involving a larger and diverse sample, and conduct follow-up evaluations to assess the sustainability of the effectiveness of innovative health education in improving maternal knowledge and behavior towards monitoring toddler growth.

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