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The Effectiveness of Video and Leaflet Media on Mothers' Knowledge, Attitudes, And Behavior in Stunting Prevention Efforts at Puskesmas Karangmojo II

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ABSTRACT

Introduction: *Stunting is a global challenges and issues faced by societies around the world. The prevalence of stunting in the world is 148.1 million or 22.3%. The highest incidence of stunting is in Asian countries (52%) and African countries (43%). Stunting causes morbidity and mortality.* ***Objective****: to analyze the effectiveness of video and Leaflet media on mothers' knowledge, attitudes, and behavior to prevent stunting.* ***Method:*** *This quasi-experiment study used a non-equivalent control group design. It involved 32 mothers who have low birth weight babies (LBW) selected using purposive sampling techniques. Prior to its use, the questionnaire was subjected to tests of validity and reliability. The collected data were subsequently analyzed using statistical techniques, specifically paired t-tests and independent samples t-tests.* ***Results:*** *video and leaflet media effectively increased mothers' knowledge, attitudes, and behavior with a sig value of p = 0.000. The intervention group got the highest score with an average value of 15.62, 12.00, and 13.44 for knowledge, attitude, and behavior respectively. There was no significant difference in mothers' knowledge (0.522), attitude (0.052), and behavior (0.476). Multiple Regression Analysis with a dummy on age, education and occupation did not influence mothers' knowledge, attitude, and behavior to prevent stunting.* ***Conclusions:*** *Videos and leaflets effectively improve mothers' knowledge, attitudes, and behaviors towards stunting prevention efforts at Puskesmas Karangmojo II. however, no significant difference was found between the two grous.*

Keywords: Knowledge; Attitudes; Behaviors; Mothers; Stunting; Prevention

Introduction

Stunting has become a global problem as WHO reported the prevalence of stunting reaching 148.1 million or 22.3% in 2022. In 2022, the highest incidence of stunting was in Asian countries (52%) and African countries (43%) (WHO et al., 2023)(WHO, 2022). The 2022 Indonesian Toddler Nutrition Status Survey (SGBI) reported that 21.6% of Indonesian children under five were stunted, translating to more than 5 million affected children out of a total population of roughly 23 million in that age group (SSGI, 2023). Besides, in 2022, DI Yogyakarta Province experienced a stunting prevalence of 21.64%, with Gunung Kidul District exhibiting the highest incidence (23.5%). Gunung Kidul District Health exhibited the highest stunting prevalence was in Puskesmas Karangmojo II with 205 cases. The current figure is inconsistent with the 2024 target outlined in the 2020-2024 medium-term government plan and Presidential Regulation No. 72 of 2021, which requires the prevalence to be under 14% (Kemenkes RI, 2021).

Stunting in developing countries is significantly influenced by a confluence of factors, including low birth weight (LBW), maternal education levels, household income, and sanitation infrastructure (Apriluana, 2018)(Lestari & Amalia, 2025). Neonates classified as LBW are particularly vulnerable to subsequent growth impairments and development problems, and even

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this condition can cause death (Wicaksana & Rachman, 2023). LBW is one of the determinants of stunting problems (Amalia & Ismarwati, 2023). Besides that Insufficient maternal understanding of health and nutritional principles is a contributing factor to stunting (Fitriani & Darmawi, 2022). Supporting the idea that maternal attitudes and their knowledge about health and nutrition are closely correlated. Lack of maternal nutritional awareness leads to a lack of efforts to prevent stunting. Even, a child's short stature is considered normal and does not affect their future growth, so there is no need for special care (Fuady et al., 2020).

Stunting demonstrably impairs children, both directly and indirectly (Chowdhury et al., 2020). In the short term, stunting is associated with discernible disruptions to body metabolism, physical growth, brain development, and intelligence. In the long term, it also reduces immunity, which can cause illness, obesity, and other physical development disorders (Argaw et al., 2022). Besides, LBW increases global neonatal mortality by around 60-80% (Shrestha et al., 2020).

The national strategy aims to achieve the target of sustainable development goals in 2030, namely to accelerate stunting reduction by 14% in 2024. The national action plan addresses stunting through a targeted family-centered approach to increase access to essential information and services. This is achieved via counseling initiatives, referral pathways, and the implementation of social assistance programs (Kemenkes RI, 2021). The government also tries to increase nutritional literacy, promoting physical activity and health education, and expanding access to high-quality, scientifically grounded nutritional services (Nutrition & Strategy, 2021). These efforts will have a broad impact if the government is able to target specific targets (Wulandari et al., 2023).

The available stunting programs in DI Yogyakarta focus on nutrition education and healthy lifestyles. In pursuit of the national stunting reduction target of 14%, the DI Yogyakarta government focuses on three main topics of stunting reduction, namely diet, parenting, and sanitation. The findings indicated that mothers' knowledge and attitudes about additional food are still lacking. This problem greatly contributes to the factors influencing stunting (Puspitasari et al., 2023). Therefore, it is important to raise mothers' awareness about stunting prevention, especially those who have LBW babies by providing education and health promotion related to stunting.

Islam also commands to prepare a strong generation to replace the weak generation as stated in Surah an-Nisa (9). This verse instructs those responsible for others, particularly guardians and executors, to act with profound concern, as if they were protecting their own vulnerable children. They are urged to be mindful of God and to speak with absolute fairness.

One of the prevention of Stunting is through education for mothers in changing behavior to improve family health and nutrition. Maternal knowledge serves as a critical determinant shaping both parental caregiving behaviors and the nutritional well-being of offspring. With the health promotion process to increase public knowledge which in turn facilitates better health maintenance and improvement (Kirana et al., 2022). Health Technology Assessment (HTA) is an important approach in stunting prevention as it helps in selecting effective interventions to reduce stunting rates and has the potential to provide long-term benefits to enhance maternal knowledge, attitudes, and behavior to hinder stunting (Ponum et al., 2020). The health promotion to prevent stunting and change maternal knowledge, attitudes, and behavior uses learning media to carry out educational activities about stunting (Asmawati et al., 2021).

The selection of media in delivering health promotion is also important. Both non-audiovisual and audio-visual media are used to promote health. Audio-visual media are deemed superior and more engaging due to their integrated presentation of auditory and visual stimuli (Rusmandani et al., 2023). Previous studies indicated the commonly used non-audiovisual media are leaflets to deliver information or health messages. The contents of the information can be disseminated through diverse modalities, including textual narratives, visual representations, or

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a synergistic integration of both (Novita et al., 2021). Jannah & Timiyatun, (2020) show an influence of leaflet media with (p = 0.000). Another study involving 67 respondents showed an increase in the pretest and post-test scores so leaflet media influence knowledge and behavior with a p-value <0.05 (Hartoyo et al., 2021). The level of memory capacity obtained through the use of audiovisual media is the highest, namely 50% (Fitriana, 2023). Another study shows that educational interventions employing audio-visual media result in a 4% increase in respondent knowledge (Kurniasari et al., 2023).

Consistent with the stated background, the researcher conducted a study entitled "The Effectiveness of Video Media and Leaflets on Mothers' Knowledge, Attitudes and Behavior in Efforts to Prevent Stunting at the Karangmojo II Health Center", to determine the effectiveness of video and leaflet media on mothers' knowledge, attitudes, and behavior in preventing stunting at the Karangmojo II Health Center.

Methods

This study employed quasi-experiment approach with non-equivalent control group design. The sample was mothers with LBW babies AGED 6-<24 months at Puskesmas Karangmojo II. The study utilized 32 respondents as samples, distributed equally with 16 respondents assigned to the intervention and control group. The determination of the sample used a purposive sampling technique (BPS, 2018). The inclusion criteria were mothers who did not experience visual and hearing impairments, were able to communicate, were willing to be respondents, had LBW children aged 6 - <24 months, and had children who did not have physical and mental disabilities. Meanwhile, the exclusion criteria were mothers who had LBW babies who were not on the site. Prior to its use, the questionnaire was subjected to tests of validity (>0,05) and reliability Knowledge (0.909), Attitudes (0.901), dan Behavior (735). 3 experts, namely instructional design experts, instructional media & communication specialists, and subject matter experts, have evaluated the leaflet and video used. homogeneity test with Levene's test and normality with Shapiro-Wilk test and the collected data were subsequently analyzed using statistical techniques, specifically paired t-tests and independent samples t-tests.

Results

Table 1. Characteristics of Respondents

Characteristics		Intervention group (video)		Control group (*leaflet*)	
		N	%	n	%
Education	Primary education	1	3.1	0	0
	Secondary education	14	93.8	16	100
	Higher education	1	3.1	0	0
Employment	Employed	4	25	2	12.5
	Unemployed	12	75	14	87.5
	Total	16	100	16	100

According to Table 1, respondents in both the intervention and control groups were primarily characterized by secondary school level education, with a distribution of 93.8% and 100%, respectively. Similarly, the unemployed category, namely 75% and 87.5% respectively.

Table 2 Characteristics of Respondents by Age

Group	n	Mean	St. Deviation	Min	Max
Intervention	16	31.87	5.760	23	46
Control	16	30.38	5.162	21	39

Based on Table 2, regarding age demographics, the intervention group exhibited an age range of 23 to 46 years, with a mean age of 32 years. Conversely, the control group presented an age range of 21 to 39 years, with a mean age of 30 years.

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Table 3. Mean Values of Mother's Knowledge Before and After the Intervention

	Video Group						Leaflet Group					
	N	Min	Max	Mean	SD	Mean difference	N	Min	Max	Mean	SD	Mean difference
Pretest	16	63	84	75.69	1.510	15.62	16	63	84	75.63	1.661	13.75
Posttest	16	84	100	91.31	1.309		16	68	100	89.38	2.077	

Based on table 3, the mean value for knowledge of 16 respondents in the Intervention group (video) before and after the intervention is 75.69 and 91.31 respectively. A comparative analysis revealed a 15.12 mean value increase in the intervention group following the intervention. In the control group, which utilized leaflets and consisted of 16 respondents, the mean values rose from 75.63 to 89.38, yielding a mean difference of 13.75.

Table 4. Mean Values of Mother's Attitudes Before and After the Intervention

	Video Group						Leaflet Group					
	N	Min	Max	Mean	SD	Mean Difference	N	Min	Max	Mean	SD	Mean Difference
Pretest	16	70	88	80.13	1.316	12	16	72	90	81.13	1.258	9.87
Posttest	16	82	100	92.13	1.287		16	80	100	91.00	1.503	

Based on table 4, the mean value for the attitude of 16 respondents in the Intervention group (video) before and after the intervention is 80.13 and 92.13 respectively. Therefore, the intervention group demonstrated a mean difference of 12.00 between pre- and post-intervention values. Conversely, the control group, utilizing leaflets and comprising 16 respondents, exhibited pre- and post-intervention mean values of 81.13 and 91.00, respectively, resulting in a mean difference of 9.87.

Table 5. Mean Values of Mother's Behavior Before and After the Intervention

	Video Group						Leaflet group					
	N	Min	Max	Mean	SD	Mean difference	N	Min	Max	Mean	SD	Mean difference
Pretest	16	60	90	80.31	9.569	13.44	16	65	90	76.56	6.511	11.57
Posttest	16	85	100	93.75	4.282		16	80	100	88.13	4.78	

Table 5 shows that the intervention group, utilizing video media and comprising 16 respondents, demonstrated pre- and post-intervention mean behavioral values of 80.31 and 93.75, respectively, resulting in a mean difference of 13.44. Conversely, the control group, employing leaflets and consisting of 16 mothers, exhibited pre- and post-intervention mean behavioral values of 76.56 and 88.13, respectively, yielding a mean difference of 11.57.

Table 6. Normality and Homogeneity Tests

Indicator	NORMALITY			HOMOGENEITY
	Sig	Limit	Description	
Knowledge				
Pretest Intervention	0.151	>0.05	Normal	
Posttest Intervention	0.116	>0.05	Normal	0.606 (>0.05)
Pretest Control	0.053	>0.05	Normal	(Homogeneous)

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Indicator	NORMALITY			HOMOGENEITY
	Sig	Limit	Description	
Posttest Control	0.084	>0.05	Normal	
Attitude				
Pretest Intervention	0.353	>0.05	Normal	
Posttest Intervention	0.943	>0.05	Normal	0.929 (>0.05)
Pretest Control	0.093	>0.05	Normal	(Homogeneous)
Posttest Control	0.079	>0.05	Normal	
Behavior				
Pretest Intervention	0.630	>0.05	Normal	
Posttest Intervention	0.617	>0.05	Normal	0.059 (>0.05)
Pretest Control	0.059	>0.05	Normal	(Homogeneous)
Posttest Control	0.149	>0.05	Normal	

Table 6 presents the normality test results for pre- and post-test data concerning knowledge, attitudes, and behavior within both the intervention and control groups, revealing significance values exceeding 0.05. This finding indicates that the data are normally distributed, thereby justifying the utilization of paired and independent t-tests for comparative analysis. The homogeneity test uses the Levene test with the value of knowledge, attitudes and behavior > sig (0.05). Thus, the data in this study are homogeneous meaning that the sample data have the same variance.

Table 7. Results of T-test for Knowledge, Attitudes and Behavior in the Intervention Group and Control Groups

Variable	Paired T-test				Independent T-test		
	Mean	Difference value	Std. Deviation	Sig	Mean	Difference value	P-value
Knowledge							
Pretest Intervention	75.69	15.62	6.041	0.000	91.31	1.93	0.436
Posttest Intervention	91.31		5.237				
Pretest Control	75.63	13.75	6.642	0.000	89.38		
Posttest Control	89.38		8.310				
Attitude							
Pretest Intervention	80.13	12.00	5.265	0.000	92.13	1.12	0.574
Posttest Intervention	92.13		5.149				
Pretest Control	81.13	9.87	5.032	0.000	91.00		
Posttest Control	91.00		6.011				
Behavior							
Pretest Intervention	80.31	13.44	9.569	0.000	13.44	1.87	0.476
Posttest Intervention	93.75		4.282				
Pretest Control	76.56	11.57	6.511	0.000	11.57		
Posttest Control	88.13		4.787				

Table 7 shows a significant difference between the mean value for the pretest and post-test scores of the intervention group with a difference of 15.62, 12.00, and 13.44 for knowledge, attitude, and behavior respectively. Similarly, the difference in mean value between the pretest and posttest for the control group is 13.75, 9.87, and 11.57 for knowledge, attitude, and behavior respectively. Paired t-test analysis yielded statistically significant results (p = 0.005), demonstrating a significant enhancement in maternal knowledge, attitudes, and behavior pertaining to the intervention. Conversely, independent sample t-tests revealed no significant intergroup differences in mean knowledge (p = 0.436) and attitude (p = 0.574) values. However, a significant intergroup difference was observed in mean behavioral values (p = 0.476).

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Table 8 The influence of age, education, and occupation on mothers' knowledge, attitudes and behavior in efforts to prevent stunting

Indepenent variables	Dependent variables		
	Knowledge	Attitude	Behavior
	P-value		
Age	0.673	0.928	0.534
Education	0.541	0.640	0.657
Employment	0.440	0.420	0.726

Based on Table 8, age, education, and employment do not affect knowledge, attitudes and behavior with a p-value> 0.05.

Discussion

Mother's Knowledge Before and After Intervention

The difference test results within the intervention group indicate a mean difference between pre-test and post-test scores, namely 15.62. This indicates that video and leaflet media significantly increase mothers' knowledge to prevent stunting with a p-value <0.000. Besides, the analysis for the control group shows a mean difference between the pretest and posttest, namely 13.75. This indicates that video and leaflet media can significantly increase mothers' knowledge to prevent stunting with a significance p-value <0.000. These results align with the findings of (Arimaswati et al., 2022), which also revealed a significant variation in respondents' mean knowledge of stunting following an intervention. In this study, the mean value (mean) for knowledge in the post-test is better (87.9%) compared to the pretest (69.6%). Maternal knowledge is a statistically significant determinant of child growth and development (p < 0.001)(Prasetyo et al., 2023). Knowledge can help change better behavior. To optimize child growth and development, mothers possessing adequate nutritional and developmental knowledge are empowered to provide appropriate dietary choices and quantities to their children (Alifariki et al., 2020).

Effectiveness of video media and leaflets on mothers' knowledge to prevent stunting

Independent sample t-tests revealed no statistically significant intergroup difference in mean knowledge values (t = 1.93, p = 0.436), the intervention group (video) exhibited the highest post-test mean knowledge score (91.31%). This suggests a significant intra-group knowledge increase. Furthermore, post-test results indicated an overall knowledge improvement among mothers. Consequently, video media can be deemed effective in enhancing knowledge regarding stunting within Puskesmas Karangmojo II.

The selection of media in delivering health promotion needs to be considered. Non-audiovisual media can also be used to promote health. Audiovisual media are preferred due to their integration of auditory and visual elements, enhancing engagement (Rusmandani et al., 2023). Knowledge retention through videos is better than leaflets. This aligns with the results of Nuraini et al., (2021) that there is a significant increase in knowledge after video education intervention. This indicates using video media for health education is effective (p = 0.000). The level of memory capacity obtained through video media (audiovisual) is the highest, namely 50% (Fitriana, 2023). Other studies show that 4% knowledge gain among respondents educated via audiovisual methods (Kurniasari et al., 2023).

Table 9 shows that age, education and employment do not affect the increase in the mother's knowledge to prevent stunting. This is supported by a previous study (Nshimyiryo et al., 2019) that Educational attainment does not solely determine maternal knowledge levels, as less-educated mothers can possess comparable knowledge to those with higher education as people can learn about nutrition from television shows or other non-formal media. The mother's

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knowledge is more important than her education. In this study, the average age of the mother in the intervention and control group is 32 years and 30 respectively. Although there is no relationship with stunting prevention (Titaley et al., 2022) emphasize that as a person gets older, he does not only learn from their own experiences but also learn from various sources of knowledge available. Maternal age does not determine stunting but the mothers' knowledge is more important (Marlani et al., 2021).

A significant proportion of mothers in this study were unemployed, with 75% in the intervention and 87.5% in the control group Rifai & Dewi, (2023) reveal that unemployed mothers are better able to accompany and observe their children's eating behavior. However, working mothers have the ability to buy nutritious food because of their high family income. The increase in knowledge in this study is due to the intervention of video and leaflet media. Intervention media are important for disseminating information about stunting to mothers. They can gain new knowledge at any time through this connection and exchange of information (Kisman et al., 2020).

Mother's Attitudes Before and After Intervention

The intervention resulted in an average increase of 12.00 between pre- and post-test values. This means that video and leaflet media significantly improve mothers' attitudes to prevent stunting with a p-value <0.000. Besides, in the control group is 9.87. This means that video and leaflet media significantly improve mothers' attitudes to prevent stunting with a significance value of p-value <0.000.

Educational media can improve mothers' attitudes (p=0.046) to prevent stunting so they can be considered as a viable alternative for intervening to improve health behaviors related to stunting prevention (Naulia et al., 2021). This aligns with the findings indicate that that educational interventions for mothers with stunted children influence the quality of mother's attitudes in their care (Munir & Audyna, 2022).

Effectiveness of video and leaflet media on mothers' attitudes to prevent stunting

Independent t-tests showed no significant difference in maternal knowledge (t = 1.12, p = 0.574) between the intervention and control groups. In this study, the highest mean value for attitude (92.13%) is in the group with video intervention. This shows an optimal increase in attitudes in the intervention group which can be seen from the posttest results that mothers experienced an increase in overall attitudes. Therefore, it can be said that video media are effective in improving maternal attitudes to hinder stunting in Puskesmas Karangmojo. This supports a previous study by Ginting et al., (2022) that there is a significant difference between pretest and posttest for attitudes regarding stunting prevention using audio-visual media with a p-value of 0.000 <0.05. Another study reveals that after the intervention using audiovisual media, there is an increase in positive attitudes (92%) in preventing stunting with a p-value = 0.00 (p <0.05) (Rusmandani et al., 2023).

Table 9 shows that age, education, and employment do not affect the increase in mothers' attitudes to prevent stunting. However, there are supporting factors like health facilities and family, friends, and health worker's support (Mutingah & Rokhaidah, 2021). The increase in attitudes is due to the intervention of video and leaflet media. Videos influence mother's attitudes to prevent stunting (p = 0.000) with the category from poor to good. Conveying health information about stunting through videos can change the way mothers think. Health workers, either cross-sectoral or nationally, need to consider mothers with poor perspectives about stunting prevention as it significant influences on the incidence of stunting in pediatric populations under five (Astriani et al., 2023).

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Mother's Behavior Before and After Intervention

The intervention group has an average difference between the pretest and posttest scores, namely 13.44. This indicates that video and leaflet media significantly improve the mother's behavior to prevent stunting with a p-value <0.000. The control group has a mean difference between the pretest and posttest scores, namely 11.57. This means that video and leaflet media significantly improve the mother's behavior to prevent stunting with a significance value of <0.000. These findings align with Astriani et al., (2023) that there is no significant difference in the mother's behavior after the intervention with a p-value of 0.476 (p> 0.05).

Effectiveness of video media and leaflets on mothers' Behavior to prevent stunting

The results of the independent sample t-test show a significant difference in the mean value of mother's knowledge between the intervention group and the control group, namely 1.87 with a significance level of 0.476. In this study, the highest mean value for behavior (93.75%) is in the intervention group (video). This means that there is an increase in optimal behavior in the intervention group where the result of the post-test indicates that mothers experienced an increase in overall attitudes. Therefore, it can be said that videos effectively improve mothers' behavior to prevent stunting in the working area of Puskesmas Karangmojo II. The finding supports a previous study Astriani et al., (2023) that the dissemination of information about stunting through videos provides a significant impact with a p-value of (0.000) <0.05 on the mother's behavior to reduce stunting. Kirana et al., (2022) reveal that the mother's behavioral intervention can be carried out with a frequency of repeated exposure of 1 exposure with a time interval of 7 days.

Referring to the cone of experience theory by Edgar Dale (1969), the variation in the level of experience from direct to through communication symbols, from concrete to abstract, influences the selection of learning materials and methods, especially in terms of developing learning technology. This theory also believes that reading or visual experiences (leaflets) are two levels lower (10%) compared to audiovisual experiences (video) by hearing and seeing (30%). This means that videos can be used as a solution because they provide information with visual and audio aspects, while leaflets only provide visual information. Video media are expected to provide information that cannot be provided by image media (Ibrahim et al., 2022). Video media (audiovisual) are considered better and more interesting as they combine both elements that are heard and seen (Rusmandani et al., 2023).

Table 9 shows that age, education, and employment do not affect the mother's behavior to prevent stunting. However, there are supporting factors such as the availability of health facilities and family, friends, and health worker's support (Mutingah & Rokhaidah, 2021). The influence of friends is one of the dominant factors in shaping behavior. Friends can introduce or support new views, new attitudes, new behaviors, lifestyles, and even deviant behavior (Rifai & Dewi, 2023).

Islam requires its people to prepare a good and quality generation as stated in Ar-Ra'd verse 11: Meaning: "For him (humans) are successive (angels) before and behind him who protect him by the decree of Allah. Indeed, Allah will not change the condition of people until they change what is in themselves."

Efforts to prevent stunting are to protect oneself, family, society, and the country from danger. This is in line with God's command in the Qur'an, where the Islamic religion has set clear rules about halal and tayyib foods, which means halal and good. Every mother hopes that her child will be healthy by getting a healthy diet and adequate nutrition. Surah Al-Maidah verse 88 means: "Eat of the good, lawful things provided to you by Allah. And be mindful of Allah in Whom you believe."

The basic concept of halal food is food obtained and processed in accordance with religion. Good food is not necessarily halal, and halal food is not necessarily good. Foods that are

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considered legally halal and halal in substance are the types of food that are considered halal in the Islamic religion, for example, fruit, tubers, vegetables, etc. They are halal if they are obtained in the right way. Smart mothers can prevent stunting starting from pregnancy by fulfilling nutritional intake that can prevent low birth weight (LBW) babies, and they can also implement good parenting styles to ensure that their children receive a balanced nutritional intake. In this case, mothers with low birth weight babies can improve their knowledge and attitudes to prevent stunting, so that they can improve their knowledge and views, with the ultimate goal of changing their behavior, maintaining health, and actively participating in achieving ideal health levels.

Conclusion

Video and leaflet media are effective in improving mothers' knowledge, attitudes, and behavior to prevent stunting in the working area of Puskesmas Karangmojo II with a sig value of p = 0.000 (<0.005). The highest score in the intervention group (video) for knowledge (15.62) followed by attitude (12.00) and behavior (13.44). There is no significant difference in the mean value of the mother's knowledge, attitudes, and behavior between the intervention group and the control group with a significant value of of knowledge P=0.522, behavior P=0.052, and attitude P=0.476

Ethics approval and consent to participate

The researchers obtained approval from the research ethics committee, ethical clearance No. 3668/KEP-UNISA/V/2024, from 'Aisyiyah University Yogyakarta.

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