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The effect of booklet intervention on mother's literacy about nutrition, clean water, and sanitation to prevent stunting

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ABSTRAK

Latar Belakang: *The prevalence of stunting in 2021 in Bandar Lampung city was 5.9%. Literacy can increase mothers' knowledge and attitudes to prevent stunting in children.*
Tujuan: *Menganalisis pengaruh intervensi booklet terhadap literasi gizi, air bersih, dan sanitasi pada ibu balita untuk mencegah stunting.*
Metode: *Penelitian diawali dengan pengembangan model booklet dengan melakukan pengujian pada 15 orang ibu balita, kemudian dilakukan intervensi literasi gizi dengan menggunakan booklet tersebut. Desain penelitian ini adalah quasi eksperimen yang dilaksanakan pada bulan Juli 2023. Sampel sebanyak 60 responden diambil secara purposive sampling dengan kriteria inklusi ibu yang memiliki anak usia 24-59 bulan, masing-masing posyandu terdiri dari 30 ibu balita sebagai kelompok kontrol (tanpa media booklet) dan intervensi (media booklet). Waktu pengamatan intervensi dilakukan selama 2 minggu. Analisis hasil penelitian dilakukan dengan uji t independen dan uji t berpasangan.*
Hasil: *Terdapat peningkatan rata-rata pengetahuan literasi ibu balita (p=0,012) dan penurunan tidak signifikan pada kelompok kontrol (P= 0,170). Rata-rata sikap literasi mengalami penurunan yang tidak signifikan pada kelompok eksperimen (P= 0,173) dan pada kelompok kontrol (P= 0,176). Hasil uji t independen membuktikan terdapat perbedaan rata-rata skor lliterasi total pada kelompok kontrol dan intervensi (p=0,022). Kondisi literasi kelompok eksperimen sebelum dan sesudah intervensi tergolong baik (skor=14), perubahan yang paling terlihat adalah literasi gizi dari baik menjadi sangat baik.*
Kesimpulan: *Intervensi dengan menggunakan media booklet gizi, air bersih dan sanitasi efektif meningkatkan literasi ibu balita untuk mencegah stunting. Kebijakan dan ketentuan penggunaan model booklet dapat diterapkan pada program promosi kesehatan dan pendidikan untuk mendukung pencegahan stunting.*

KATA KUNCI*: booklet; literasi ibu; stunting*

ABSTRACT

Background: *The prevalence of stunting in 2021 in Bandar Lampung city was 5.9%. Literacy can increase mothers' knowledge and attitudes to prevent stunting in children.*

Objectives: *The research aimed to analyze the effect of booklet intervention on nutritional, clean water, and sanitation literacy of mothers under five to prevent stunting.*

Methods: *This study began with the development of a booklet model by testing it on 15 mothers of toddlers, and then a nutritional literacy intervention was carried out using the booklet. The design of this study was a quasi-experiment carried out in July 2023. A sample of 60 respondents was purposive sampling with inclusion criteria of mothers who had children aged 24-59 months, each Posyandu (English: integrated health service post) consisted of 30 mothers of toddlers as the control group (without booklet media) and intervention (booklet media). The observation period for the intervention was carried out for 2 weeks. Analysis of the research results was carried out using independent t-test, paired t-test, and chi-squared test.*

Results: *There was an increase in the average literacy knowledge of mothers (p=0.012) and an insignificant decrease in the control group (P=0.170). Average literacy attitude experienced an insignificant decrease in the experimental group (P=0.173) and the control group (P=0.176). Results of the independent t-test proved that there was a difference in the average total literacy score in the control and intervention groups (p=0.022). The literacy condition of the experimental group before and after the intervention was classified as good (score=14), the most visible change was nutritional literacy from good to very good.*

Conclusions: *Interventions using a booklet model of nutrition, clean water, and sanitation media are effective in increasing the literacy of mothers of toddlers to prevent stunting. Policies and provisions for the use of the booklet model can be applied to health promotion and education programs to support stunting prevention.*

KEYWORD*: booklet; mother's literacy; stunting*

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INTRODUCTION

Stunting is a condition where children under five have a length or height that is less or inappropriate compared to their age, which results in the child experiencing difficulties in achieving optimal physical and cognitive development. World Health Organization lists the prevalence of stunting in the world at 22%, or 149.2 million children under five in 2020 (1). The stunting rate in Indonesia has decreased from 24.4% in 2021 to 21.6% in 2022. In Lampung Province, the stunting rate of 15.2% in 2022 is already below the national average, but there are still several districts in Lampung Province that have a high stunting rate that even exceeds the provincial and national average (2). A study in Pesawaran Regency showed stunting rate was 33.3% with low birth weight (LBW) being the dominant factor in stunting (3). In North Lampung Regency, there were 26% of stunted toddlers with the dominant factor being environmental sanitation (4). Meanwhile, in West Tulang Bawang Regency, 10.9% are stunting, with the risk factor for stunting being the unavailability of water drainage channels (5). There is a relationship between parenting patterns, feeding practices, and environmental sanitation with the incidence of stunting in toddlers aged 6-59 months at the Mangoli Health Center, North Maluku (6). Results of the Indonesian Nutritional Status Survey (SSGI) showed that the prevalence rate of stunting in 2022 was 11.1%. The prevalence rate increase by about 2,3% in 2023 based on the National Health Survey. However, the Lampung regional government has the challenge of continuing to prevent stunting so that all districts/cities in Lampung Province can achieve the national target of 14% by 2024.

Stunting is caused by various things, both direct and indirect causes. Research results from

Bima (2019) stated that the problem of stunting is caused by various factors, including poor parenting practices such as low knowledge about health and nutrition, babies not getting exclusive breast milk, children under two years old not getting complementary food, limited health services, low access to nutritious food, and low access to clean water and sanitation (7). Children whose food consumption is not various have a 4.48 times risk of not being able to meet their micronutrient intake, which means inadequate micronutrient intake leads to stunting (8). Also, social-economic factors such as family size more than equal to 5 person, high father's education, low and medium economic status were related to the low diet quality of children aged 12-23 months (9). Stunting is also caused by three main problems, namely exclusive breastfeeding, dietary intake, and maternal knowledge (8). The prevalence of stunting was also found to be higher in children living in locations with low access to WASH (Water, Sanitation, and Hygiene) (10).

The national stunting strategy in pillar 2 to accelerate stunting prevention is a national campaign and communication of change that aims to increase public awareness and change community behavior to prevent stunting. Furthermore, stunting national strategy has also determined priority interventions to prevent stunting which are divided into two groups, namely specific interventions and sensitive interventions. Specific interventions are interventions that target the direct causes of stunting and are almost entirely in the health sector. Sensitive interventions are interventions that target indirect causes and are outside the health sector [10].

Atamou et al. (2022) stated that it is necessary to carry out interventions to increase maternal knowledge to reduce the prevalence of stunting in toddlers. Nutrition education is a nutritional intervention that aims to increase knowledge and motivation towards changing attitudes and behavior (12). Nutrition education can increase maternal knowledge due to the information conveyed to mothers of toddlers (13). Yunitasari et al. stated that there was a significant value between education, brainstorming and demonstrations on increasing knowledge, attitudes and behavior of mothers in preventing stunting in the intervention group, while in the control group there was no significant value (14). Nutrition education given to the intervention group reduced stunting rates by 10% more than the control group (15). Apart from that, education is also needed regarding household and environmental sanitation or environmental health to prevent stunting. Ownership of waste disposal facilities is positively correlated with the incidence of stunting (3). The difference with other studies from Suryati and Suryadi (24) and Wulan (25) only provided knowledge related to nutrition in their booklets so that the booklet material in this study is more complete and comprehensive. The booklet in this study has also been proven to improve knowledge and attitudes about nutrition, clean water, and maternal sanitation, which is expected to prevent stunting in toddlers that has an impact on children's cognitive inhibition.

Candarmaweni (2019) showed that the importance of promotion and marketing aspects in community empowerment will get optimal results in preventing stunting (16). Effective prevention of stunting can be done, among other things, by providing nutritional education to influential parties such as cadres, mothers of toddlers, pregnant women, and expectant mothers. Mothers with good knowledge provide good nutrition for their children. Therefore, this research developed a booklet model about nutritional intake, clean water, and sanitation to prevent stunting, which was used as a literacy intervention for mothers of toddlers in Bandar Lampung City.

MATERIALS AND METHODS

The research design was quasi-experimental with a nonequivalent control group design. This research provides literacy intervention to mothers of toddlers using a booklet model about nutrition, clean water, and sanitation to see changes in mothers' knowledge and attitudes. There were intervention and control groups whose knowledge and attitudes were measured before and after the literacy intervention (Figure 1). The research was carried out at Posyandu Lestari II (Experiment Group) and III (Control Group), Tanjung Raya Village, Kedamaian District, Bandar Lampung City from June to July 2023. The distance location between the control and experiment groups was approximately 10 km. This research received ethical approval from the Indonesian Mitra

University Research Ethics Commission No. 25/128/FKES/2023.

The population was mothers who had toddlers aged 24-59 months in Kedamaian District, Bandar Lampung City. Samples were taken using a purposive sampling technique, namely mothers with toddlers aged 24-59 months who came to Posyandu Lestari II and III during the research. Calculation of the sample size uses the hypothesis testing equation for 2 paired groups. The standard deviation of balanced nutrition knowledge based on research by Nuryanto et al. (2014) (17) namely 11.3 points and the expected difference is 5.5 points. The sample size for each experimental and control group was 30 respondents, so the total sample was 60 respondents.

This research was carried out in two stages, namely the first stage was developing a booklet model in size 20 x 20 cm about nutrition, clean water, and sanitation, and was tested on 15 mothers of toddlers online with Google Forms. The trial includes an assessment of the cover, understanding of the content, layout, font size, number of pages, image appearance, and color combination. Topics in the booklet model include nutrition such as definitions, objectives, nutrition requirements, things that need to be considered when providing breast milk and complementary food, and the composition of breast milk. The booklet model also contains material about clean water and sanitation such as the definition of clean water, the benefits of clean water, the meaning of healthy latrines, reasons for using healthy latrines, and the benefits of healthy latrines.

The second stage was providing nutritional literacy, clean water, and sanitation interventions to respondents in the intervention group using a booklet model, while the control group was not given a booklet model. The data collection tool used was a pre- and post-test questionnaire which was filled in directly by the respondent and accompanied by the researcher. Mothers of toddlers at posyandu filled out the pre-test first in both the intervention and control groups. Then the intervention group was given nutritional literacy, clean water, and sanitation to mothers and the discussion/question and answer lasted for 40 minutes. After 2 weeks of intervention, the intervention group will be given a post-test, as will the control group. During research, the control group was not given any treatment. The control group was only given pre and post-test also without any intervention. Nevertheless, after the research was over, the control group received the same treatment as the experiment group and was also given a leaflet.

The nutrition, clean water, and sanitation knowledge questionnaire consists of 25 questions. Each question with a correct answer will be given a score of 1 and if it is wrong 0. The respondent's knowledge score is obtained by adding up the scores of correct answers and comparing it with the maximum total score (24), then multiplied by 100. Knowledge is in the good category if ≥60 and poor if < 60. The nutrition, clean water, and sanitation attitude questionnaire consists of 15 questions with answers on a Likert scale of 1-5 (1=strongly disagree; 2=disagree; 3=undecided; 4=agree; 5=strongly agree). The respondent's attitude score is obtained by adding up the answer scores and comparing it with the maximum total score (60), then multiplying it by 100. Attitudes are in the good category if ≥60 and poor if <60.

The total score is the combination score between the knowledge and attitudes of mothers of toddlers before and after intervention. The total score is measured by the research Cut of Point (COP), namely the average value, so if < average value then it is low, and if ≥ average value then it is high. The literacy level condition is the attainment of the literacy level regarding the knowledge of attitudes of mothers of toddlers regarding aspects of nutrition, clean water, and sanitation to prevent stunting based on a Likert scale (1-5) before and after the booklet media intervention, which is calculated in total. If the literacy level condition score is between 3-5 then it is very poor; 6-8= less; 9-11 = enough; 12-14=good; > 15 = very good (because the number of sub variables is 3 aspects, the minimum value is 3, the maximum value is 15).

Data processing used Microsoft Excel 365 and data analysis used the SPSS Ver 26 computer program. The data analysis used was descriptive in the form of mean, min-max, standard deviation, standard error, and frequency distribution (n,%). Inferential analysis, namely bivariate tests such as independent t-test, paired t-test, and chi-square with a significance level of 5%.

RESULTS AND DISCUSSIONS

Pilot Test of Booklet Model

The first stage of this research was to prepare a booklet model that includes material on nutrition aspect, clean water, and sanitation consisting of 19 pages. The booklet has been tested on 15 mothers, with the characteristics of an average age of 33 years, the highest education level at the college level, and the majority as housewives. The results of the booklet model trial showed that the overall booklet model did not need changes because 100% of respondents understood the content, with details being very good at 33% and good at 67%. Meanwhile, the layout, image display, and color combination are considered good.

A booklet is a medium with a simple structure, has an attractive appearance, namely contains writing and images, and can be presented in hardcopy (printed results) or softcopy (electronic media) so it is easier for respondents to obtain information in a short time (18). The booklet media is effective and practical, easy to carry, and can be read at any time, so that as a health education media it can improve the knowledge and attitudes of mothers of toddlers whose children are stunted (19).

Respondent characteristics

The largest proportion of mother's education in the experiment and control was ≥ senior high school and ≥ 30 years. The status of working mothers in the control group was the same as in the experiment group, namely 3.3%. There were more maternal deaths that did not work in the control group than in the experimental group.

Table 1. Distribution of respondents based on individual characteristics in the experimental group and control group in 2023

Individual Characteristics	Group				P-Value[a]
	Experiment		Control		
	n	%	n	%	
Age					
≥ 30 years	18	60.0	20	66.7	0.264[b]
< 30 years	12	40.0	10	33.3	
Mother's Education					
≥ Senior high school	21	70.0	15	50.0	
< Senior high school	9	30.0	15	50.0	0.114[c]
Occupation					
Worked	1	3.3	1	3.3	
Nor worked	29	96.7	29	96.7	0.754[c]

[a]significance 5%; [b]independent t-test; [c]chi square test

Respondent Equality Test.

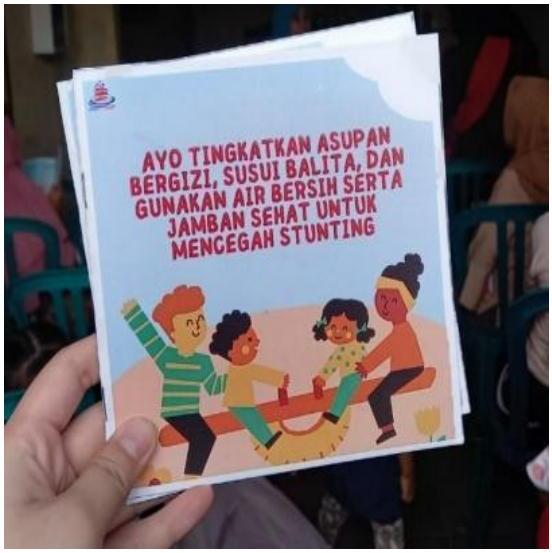
Table 1 can also be used to find out the equality of the two groups of toddler mothers by looking at the characteristics of the respondents, so this study carried out an equality test. researchers conducted an independent t-test for the general variable (p Table 1 =0.264) and chi-square for the education variable (P=0.114) and mother's occupation (p=0.754). The results of the analysis were that none of the variables above have a significant difference at the 5%. Therefore, it can be said that the characteristics of respondents between the experimental and the control group are equal or equivalent.

Literacy about Knowledge and Attitudes on Nutrition, Clean Water, and Sanitation (Pre- and Post-Test)

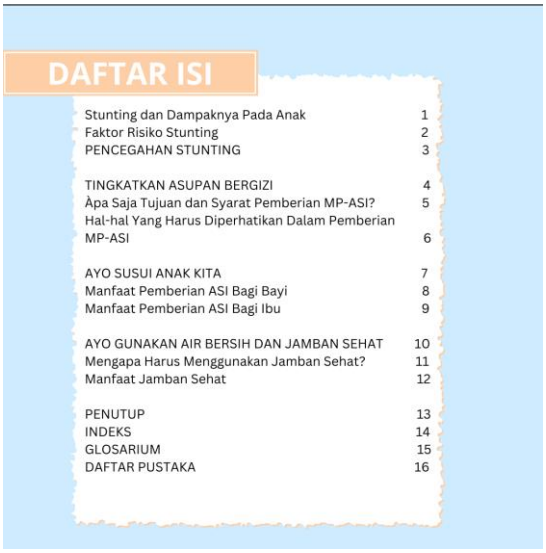
Table 2 showed that the average change in the total literacy score regarding knowledge in the experimental group increased significantly (p=0.012). Meanwhile, in the control group, there was a decrease in the total score regarding knowledge from the average. The largest increase was in knowledge about sanitation in the experimental group (+15.3 points) and the largest decrease in score was in knowledge about sanitation in the control group (-5.4 points). The results of the paired t-test showed a significant change (P=0.012) in the average total score of the

knowledge variable in the experimental group after using the booklet media model.

Table 2 showed that there was no significant increase in the average knowledge score for the nutrition aspect (P=0.619). Meanwhile, in the control group, there was no significant decrease in the average knowledge score for the nutrition aspect before and after intervention (P=0.430). This research also found that the change in literacy scores regarding the attitudes of mothers of toddlers towards the nutrition aspect in the experimental group decreased not significantly (P=0.441). Meanwhile, in the control group, changes in literacy scores regarding the attitudes of mothers of toddlers towards aspects of nutrition were increased significantly (P=0.000)



(a)



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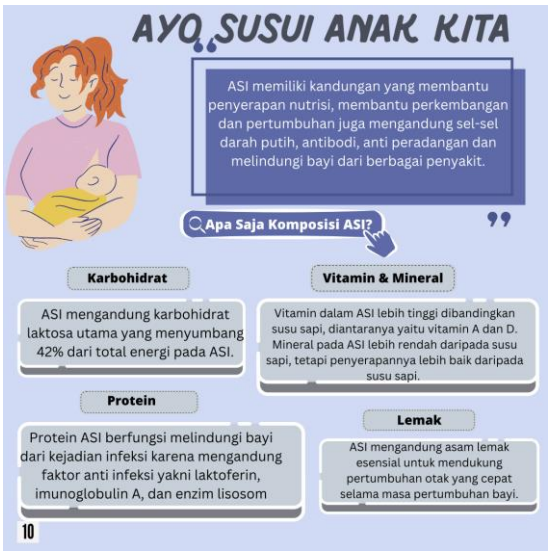

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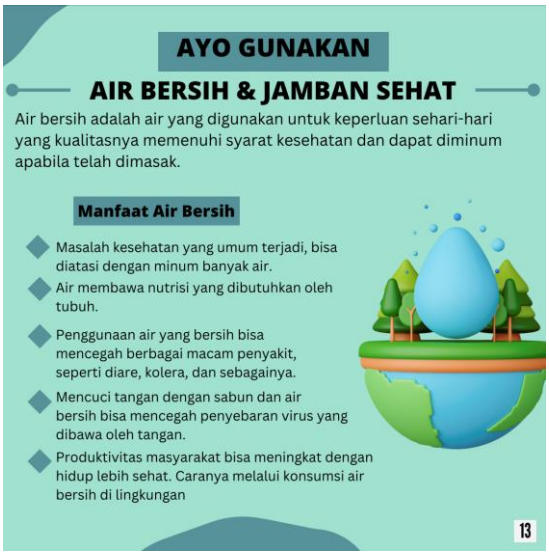

(d)

Figure 1. Booklet intervention on mother's literacy, (a) cover of booklet; (b) content of booklet; (c) nutrition content of booklet; (d) sanitation content of booklet

Table 2. Changes in literacy scores regarding knowledge and attitudes aspects of nutritional, clean water, sanitation before and after booklet intervention in two groups of respondents in Kedamaian District, Bandar Lampung City in 2023

Literacy	Experiment Group				Control Group			
	Mean ± SD		Δ Mean	p-value	Mean ± SD		Δ Mean	p-value
	Before intervention	After intervention			Before intervention	After intervention		
Knowledge							-	
Nutritional	71.3±17.1	73.5 ± 16.9	+2.2	0.619	62.2 ± 10.5	60.2±8.8	- 2.0	0.430
Clean Water	71.3±19.4	76.2 ± 2.4	+4.9	0.253	74.6 ± 18.8	72.6±16.1	- 2.0	0.661
Sanitation	61.3±22.2	76.6 ± 2.9	+15.3	0.003*	60.0 ± 21.6	54.6±13.8	- 5.4	0.260
Total	68.0±11.0	75.4 ± 9.4	+7.4	0.012*	65.6 ± 9.9	65.2±7.4	- 0.4	0.176
Attitudes							-	
Nutritional	87.6±8.1	73.5 ± 16.9	+2.2	0.619	62.2 ± 10.5	60.2±8.8	- 2.0	0.430
Clean Water	79.7±8.8	76.2 ± 2.4	+4.9	0.253	74.6 ± 18.8	72.6±16.1	- 2.0	0.661
Sanitation	87.2±11.6	76.6 ± 2.9	+15.3	0.003*	60.0 ± 21.6	54.6±13.8	- 5.4	0.260
Total	76.4±6.4	75.4 ± 9.4	+7.4	0.012*	65.6 ± 9.9	65.2±7.4	- 0.4	0.176

*significance at 5%

According to **Table 3**, the average changes score in total literacy in the experimental group was increased significantly (P=0.022). Thus, in this research, it is proven that there is an effect of intervention using the booklet model on increasing the literacy of mothers of toddlers**.** Based on **Table 4** literacy conditions of mothers of toddlers in the experimental group did not change, they still obtained a total score of 14 (good) after the intervention using the booklet media model. However, if we look at each aspect, there has been an increase in literacy conditions regarding the nutrition aspect, from good to very good. On the other hand, the total literacy condition in the control group decreased, before intervention was 11 (enough) and decreased to 10 (enough). If assessed per aspect, there was a decrease in sanitation literacy from 3 (enough) to 2 (poor). A Although overall the use of booklets in this study increased the literacy of mothers of toddlers. Knowledge and attitudes towards the nutritional aspect must receive special attention and continue to be pursued. Mothers with a high level of knowledge will try to meet the nutritional status of their child and will complete the micronutrients and macronutrients of their child (20).

Table 3. Distribution of mean changes in total knowledge and attitude scores according to respondent groups

Group	Mean ± SD (changes score)	SE	P	n
Control	-1.6 ± 5.7	1.0	0.022	30
Experiment	2.0 ± 6.3	1.1		30

Meanwhile, the booklet intervention did not alter the attitudes of nutritional aspects. In line with Rukmana's research, balanced nutrition knowledge was not significantly correlated with attitudes (21). That happens due to environmental factors such as beliefs, preferences, physiological changes, food habits, and household composition. Those factors can influence the mother's attitude towards the nutritional aspect while the condition of knowledge is good (22) This should receive special attention from mothers of toddlers whose children are stunted, as it was found that maternal nutritional knowledge was found to be less in the group of mothers with stunted toddlers than in the group of normal toddlers (23). Providing optimal nutrition during infancy and toddlerhood is very important because this period is characterized by the rapid growth and development of children.

Analyses on independent t-tests prove that there is an influence of booklet media intervention on total literacy in nutrition, clean water, and sanitation, indicated by significant changes in the

average score of total knowledge and attitudes from the control and experimental groups (p=0.022). The literacy condition of the experimental group before and after the intervention was classified as good (score=14), the most visible change was nutritional literacy from good to very good. This is in line with research by Suryati and Supriyadi (2019), pretest and posttest knowledge of mothers in the intervention group who were given booklet education showed a significant increase (p=0.001) (24).

Table 4. Assessment of literacy level conditions before and after the booklet media model intervention in the experimental group and control group according to subvariable aspects of nutritional, clean water and sanitation, Kedamaian District, Bandar Lampung City 2023

Aspect of Measured	Intervention							
	Experiment				Control			
	Before	Score (1-5)	After	Score (1-5)	Before	Score (1-5)	After	Score (1-5)
Nutritional	Good	4	Very Good	5	Good	4	Good	4
Clean water	Very Good	5	Very Good	5	Good	4	Good	4
Sanitation	Very Good	5	Good	4	Enough	3	Poor	2
Total Score	Good	14	Good	14	Enough	11	Enough	10

This means that booklets as a medium for providing education have proven to be effective in increasing mothers' knowledge about the nutritional needs of children under five. A similar thing was also stated by research by Wulansari, et al, 2019 where there was a significant difference between knowledge before and after being given health education with booklet media with a value of p-value 0.000<0.05 (26). Nutrition education using booklets and counseling increases a person's knowledge, attitudes, and behavior because education carried out with the help of media will make it easier and clearer for participants to receive, and understand the content presented and help educators in conveying the message. Good knowledge is the foundation of good attitudes. In our opinion, adequate knowledge and a positive attitude towards a balanced and varied diet can encourage parents or caregivers to provide food both in terms of quantity and quality so that it influences children's food consumption (27).

This research has limitations such as the research time to develop a booklet media model, followed by implementing a literacy intervention using a booklet media model within a month, according to the researchers, which is relatively sufficient. To assess behavioral changes, further stages are needed with a minimum time of 6 months.

CONCLUSIONS AND RECOMMENDATIONS

Nutrition, Clean Water, and Sanitation's book model was considered good including material content, layout, image display, and color combinations. The results of the paired test showed that there was a significant increase in the average literacy knowledge of mothers in the experimental group after the booklet model intervention on nutritional, clean water, and sanitation. The average attitude score experienced an insignificant decrease in the experimental group and the control group. The results of the independent t-test proved the influence of the booklet model intervention on increasing the literacy of toddler's mothers regarding nutritional, clean water, and sanitation. The literacy condition of the experimental group before and after the intervention was classified as good (score=14), the most visible change was nutritional literacy from good to very good. The literacy condition of the control group experienced a slight decrease in score, but in the same category from 11 (adequate) to 10 (adequate), the most visible change was in sanitation literacy from the sufficient to poor category.

Interventions using nutrition booklets, clean water, and sanitation are effective in increasing the literacy of mothers under five to prevent stunting. To prevent the occurrence and increase in cases of stunting, the role of toddlers's mothers should be more empowered through literacy

efforts using the booklet model. The availability of booklet literacy media at the community level, such as in posyandu or other groups of mothers of toddlers, needs to be paid attention to media procurement policy so that it can be fulfilled and used efficiently and effectively. Besides using the booklet media, nutrition education should be conducted regularly and earlier to form nutritional attitudes in mothers of toddlers.

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