

# Developing Nutrition Leaflets and Pocketbook: Improving Mother's Knowledge about Stunting

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## ABSTRACT

This study intended to increase the nutritional knowledge of mothers of children under five years of age through socialization media in leaflets and pocketbooks. This study was development research with Plomp's educational development model. The respondents were 40 mothers of children under five years of age. The data were collected by using observation and tests. The obtained data were then analyzed by using t-test and descriptive quantitative. The result showed that the nutritional knowledge of mothers of children under five increased after using the developed media. The present study also revealed that the leaflet increased the mother's nutritional knowledge more effectively than the pocketbook. At last, mothers of children under five responded that the developed media were excellent. This study suggests that the media can be used for nutrition socialization activities on a broader scale regarding the above findings.

**Keywords:** *Socialization media, Leaflet, Pocketbook, Nutrition knowledge, Stunting.*

## 1. INTRODUCTION

Stunting is a nutritional problem due to chronic malnutrition caused by multi-factorial and intergenerational aspects. This situation is represented by a z-score of height for age (H/A) less than -2 of standard deviations (SD) based on growth standards according to WHO [1]. Globally, about one out of four children under five are stunted [2]. The majority of people often consider growing short as a hereditary factor. Such misconception existing within society makes the stunting problem challenging to solve so that it requires greater efforts from the government and various related stakeholders. The results of some previous studies showed that the influence of heredity only contributed 15%, while the largest element was related to the problems of nutrient intake, growth hormones, and the occurrence of recurrent infectious diseases [3] [4].

Stunting is a public health problem that must be taken seriously. The results of primary health research (*Riskesdas*) showed that the number of stunting problems (short stature due to chronic malnutrition) was relatively stagnant at around 37% from 2007 to 2013. Of the 33 provinces in Indonesia, more than half of them have above national average prevalence rates. In 2017, with a stunting prevalence of 37.2%, 19.2% were

identified as short children and 18.0% in the very short category [5].

The age of children under five is a period that is very sensitive to the environment so that more attention is required, especially its nutritional adequacy [6]. The period of the first 1000 days of life (1000 HPK) is a critical node as the beginning of stunting growth, which has a long-term impact that repeats itself in the life cycle. Nutritional problems, especially stunting in children under five, can hamper child development several with negative implies that interfere intellectual decline, vulnerability to non-communicable diseases, decreased productivity to the point of causing poverty, and the risk of giving birth to babies with low birth weight [2][3]. Stunting growth occurring at an early age can continue and is at risk for growing short in adolescence. Children who grow short at an early age (0-2 years) and stay short at 4-6 years have a 27 times risk of staying short before entering puberty. On the other hand, children with typical growth at an early age can experience growth faltering at the age of 4-6 years and have a 14 times risk of growing short at pre-pubertal age [7].

The World Health Assembly has initiated efforts to improve nutrition related to stunting since 2012. The targets that have been set to reduce stunting prevalence

include reducing the prevalence of stunting, wasting and preventing the occurrence of overweight in children under five, reducing the prevalence of anaemia in women of childbearing age, reducing the prevalence of low birth weight (LBW) infants, and increasing the coverage of exclusive breastfeeding. Presidential Regulation Number 42/2013 concerning the National Movement for Nutrition Improvement is issued to support efforts to raise stakeholder participation and concern in a planned and coordinated manner to accelerate nutrition improvement in the first 1000 days of life (1000 HPK). The longitudinal study results conducted by the Indonesian Family Life Survey (IFLS) showed changes in the z-score of growth at an early age to pre-pubertal age. 77% of the participating children were short at an early age, failed to catch up to their growth at the toddler age, and remained short at pre-pubertal age. In contrast, the children who were short at an early age and successfully caught up with their growth at the age of toddlers; moreover, 84% grew normally at pre-pubertal age [7]. Therefore, advancing efforts and interventions to prevent stunting are still needed for children under five of age.

Stunting in children under five was much influenced by the parents' low income and education [5]. There was a relationship between the birth length of children, history of exclusive breastfeeding, family income, mother's education and knowledge about nutrition knowledge on stunting problems in children under five [8]. Therefore, it is necessary to make substantial efforts to increase mothers' nutrition knowledge through socialization.

Socialization is the process of inculcating or transferring habits, knowledge, values, and rules to others. The socialization process will be effective if supported by suitable media according to the target characteristics. The use of nutrition education media about healthy breakfast in a combination of PowerPoint slides and leaflets could increase the average score of mother's knowledge compared to the PowerPoint slides and flip chart media [9]. Pocketbook media in nutrition counselling activities was proven effective to increase mothers' knowledge about children under five's nutrition [10]. Adolescent nutritional knowledge also increased after using pocketbook media compared to PowerPoint media [4]. At last, the study on socialization media to prevent stunting needs to include developed leaflets and pocketbooks. The study aims to increase the nutritional knowledge of mothers of children under five years of age through socialization media in leaflets and pocketbooks.

## **2. METHODS**

### ***2.1. Research Design***

The study used a multi research design. First, research and development design was used to develop the media in which the development stages referred to Plomp's model consisting of five phases, namely investigation, design, realization, evaluation, and implementation. Second, a quasi-experimental research design was used to reveal how effective the media use was to increase mothers' knowledge about stunting and nutrition of children under five years.

### ***2.2. Data and Data Collection Method***

The data comprised both primary and secondary data. Primary data consisted of media validity, media effectiveness in nutritional knowledge scores, and target response to the media. Secondary data were the number of mothers of children under five, data on children under five who experienced stunting, and interviews from related agencies. The data were collected by using questionnaires and tests.

Questionnaires were used to assess the validity and responses of mothers of children under five on the use of socialization media. The test was used to obtain data on the nutritional knowledge perceived by mothers of children under five years.

### ***2.3. Research Respondents***

Respondents in the trial process were 40 mothers of children under five in Pagerngumbuk Village, Wonoayu District, Sidoarjo Regency. The research location was purposively determined in which it was located in a food-insecure area with the highest number of stunted children under five based on information from the Food Security Service of Sidoarjo Regency. The trial of the developed socialization media was carried out in Pagerngumbuk Village, Wonoayu District, Sidoarjo Regency.

### ***2.4. Research Stage***

The leaflets and pocketbook media development stages referred to Plomp, namely the investigation phase by identifying early nutritional knowledge of mothers of children under five through questionnaires and interviews with stakeholders about stunting issues. Afterwards, preparing the materials for the initial drafts of leaflets and books pockets was necessary. The materials were then compiled into desired leaflets and pocketbook designs. Then, the validity test of the media was conducted by three experts and practitioners on nutrition education. At last, the developed media were tested, followed by an analysis of its effectiveness.

## **2.5. Processing and Data Analysis**

The developed media were assessed by three validators and analyzed descriptively. The nutrition knowledge of mothers of children under five was assessed by the given questions about nutritional problems, toddlers' nutritional needs, toddler's food consumption, and toddler's health. The results were then categorized into good nutrition knowledge if the correct answer >80%, moderate if the correct answer 60-80%, and less if the correct answer <60%. The data of the effectiveness of the media were revealed by using pretest and posttest and analyzed by using t-test. The respondents' responses to the media were assessed using a questionnaire with Likert's scaling method with good, moderate, and poor categories, presented in percentage and analyzed descriptively.

## **3. RESULTS AND DISCUSSION**

### **3.1. Development of Nutrition Socialization Media**

The development of nutrition socialization media was carried out through five stages: investigation, design, realization, evaluation, and implementation. The investigation stage was undertaken by interviewing the health service unit (POSYANDU) coordinator and the Head of Pagerngumbuk Village and obtaining the initial mother's nutrition knowledge. The interview results with the POSYANDU coordinator revealed that the number of stunted children under five was not existing; however, the status of children under the red line (BGM) was still existing. Mothers of children under five received nutrition education in the form of nutrition counselling integrated with POSYANDU activities conducted once a month. The head of the village hoped that there could be appropriate media or information sources for mothers to increase their knowledge to create a healthy and happy family.

Initial data about mothers' nutrition knowledge in Wonoayu District showed that less than 50% of mothers knew about the growth and development and nutritional adequacy for children under five. 20% of them knew about nutritional problems experienced by children under five, and, most importantly, more than 80% of them did not know about stunting. Henceforth, only 30% of mothers perceived good knowledge of children under five's nutrition. Referring to the data, the materials for nutrition socialization media included growth and development of children under five, nutritional adequacy for children under five, breastfeeding/complementary feeding, nutritional problems, and stunting.

The design stage encompassed designing the socialization media and instrument design to test its validity and effectiveness. The design stage started from

preparing and developing materials based on topics obtained from the investigation stage to making media layouts and media realization. The presentation of the materials used in the media was in the form of leaflets and was arranged in a more straightforward and more information-dense manner compared to the pocketbook. The leaflets were designed based on the main topics, namely the nutritional needs and children under five. The two leaflets were in A4 size with three folded sections. The information in the leaflets and pocketbook were presented in the form of texts, pictures, and tables. The pocketbook was designed only one piece containing all the material topics and was in an A5-sized pocketbook on nutrition problems for children under five, divided into two. The pocketbook systematics consisted of title page, introduction, topic, material description, and reference. The following process was to make the layout and production of pocketbook media.

The instrument's design developed to conduct a validity test was a questionnaire assessing content, language, and display eligibility of the media. The instrument's effectiveness was revealed by conducting pretest and posttest on mothers' nutrition knowledge of children under five of age. The preparation of the pretest-posttest questions referred to the questions that were considered valid in the trial process, of which they included 20 items of nutrition knowledge.

The realization stage covered preparing leaflets and pocketbook media. There were two leaflets developed, namely leaflets on nutritional needs and nutritional problems for children under five. This was based on the consideration of the breadth of the material topics to be delivered. The nutritional needs leaflet contained information about the growth and development of children under five, breastfeeding-MPASI, and the nutritional needs for children under five. The nutritional problems leaflet focused on explaining nutritional status, nutritional problems, and stunting. Leaflets were created in an A3-sized paper containing information in the form of pictures and texts on both sides of the paper folded into three so that they were smaller in size and easier to carry.

In addition, the realization of pocketbook media was in the form of a Guidebook for Children Under Five's Nutrition Problems. The pocketbook was created in half of the A5-sized paper and consisted of 12 pages. The structure of the pocketbook consisted of a title page, preface, table of contents, presentation of material (e.g. children under five, their nutritional needs, their nutritional problems, stunting, stunting risk, and catch-up growth stunting), and reference. The presentation of texts and pictures was displayed in colour so that they looked attractive and clear. The information presented in the pocketbook was comprehensive and detailed than the leaflet's because it covered all topics of socialization material and was supported by several complementary

foods recipes that mothers of children under five could practice.

The media validity test was carried out by three

**Table 1.** Results of leaflet validation

Aspects	Validator 1	Validator 2	Validator 3
<b>Nutritional Needs Leaflet</b>			
Content/material eligibility	17	18	18
Language eligibility	9	9	8
Display eligibility	17	18	18
Total	43	45	44
Validation score	0.95 Very good	1.00 Very good	0.97 Very good
<b>Nutritional Issues Leaflet</b>			
Content/material eligibility	16	12	18
Language eligibility	8	9	5
Appropriate appearance	12	18	12
Total	36	39	35
Validation score	0.80 Very good	0.86 Very good	0.77 Good

validators whose expertise was in nutrition, education, and multimedia. The instrument was in the form of a questionnaire to assess content, language, and display eligibility. Table 1 shows the results of the validity test on the developed leaflets.

Following Table 1, the results of the validity test on the developed leaflets obtained an average value of 0.97 or included in a very good category. However, the validator gave suggestions to pay attention to the suitability of the pictures provided with the material, pay attention to the spacing, and add more information on the materials of giving complementary foods.

The nutritional problems leaflet had an average validation score of 0.81, lower than the nutritional needs leaflet, although it was still in very good criteria.

**Table 2.** Results of pocketbook validation

Aspects	Validator 1	Validator 2	Validator 3
Content/material eligibility	18	18	18
Language eligibility	9	9	7
Display eligibility	18	18	16
Total	45	45	41
Validation score	1.00 Very good	1.00 Very good	0.91 Very good

Suggestions given by the validator were to pay more

attention to spacing, use common language/terms, improve image layout and colour composition, and perfect the structure. Further, Table 2 conveys the results of the evaluation of pocketbook media.

By Table 2, all validators stated that the pocketbook media was very good or worthy to be used. Some suggestions given for media improvement included image layout settings and line spacing.

The implementation phase was carried out by testing the final draft of the media to the respondents, namely mothers of children under five in Pagerngumbuk Village. There were 13 mothers of children under five at Posyandu in Ngumbuk Village participating in trialling the leaflets. At the same time, 27 mothers were participating in trialling the pocketbook at Posyandu in Pager Village. The trial phase began with preliminary activities by completing the attendance list, greetings and working on pretest questions. The following agenda was the main activities: reading the leaflets or pocketbooks and asking questions about the materials presented. At last, the closing activities were in the form of working on posttest questions and filling out a response questionnaire about the media. At this stage, the data on the effectiveness of the socialization media were collected.

### **3.2. Effectiveness of Nutrition Socialization Media**

The effectiveness of the media was revealed from the results of the pretest and posttest. The test was multiple-choice with 20 questions and 10-minute accomplishing times.

The nutritional knowledge of mothers of children under five was good if they could get correct answers more than 80%, moderate if their correct answers 60%-

**Table 3.** Distribution of mother’s nutrition knowledge

Nutrition Knowledge	Leaflet		Pocketbook	
	Pretest	Posttest	Pretest	Posttest
Good	0 (0%)	4 (31%)	6 (22%)	5 (19%)
Moderate	12 (92%)	9 (69%)	18 (67%)	21 (78%)
Inadequate	1 (8%)	0 (0%)	3 (11%)	1 (4%)
Average score	71.54	76.54	72.78	76.67

80%, and inadequate if the correct answers are less than 60%. The range of nutritional knowledge scores obtained at the pretest and posttest ranged from 50 to 90.

Based on Table 3, there was an increase in the average score of nutrition knowledge before and after using the developed media, both leaflets and pocketbooks. However, the increase of the posttest score

**Table 4.** Paired samples t-test for leaflet media

	Paired Differences					t	df	Sig.
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Before - After	-5.000	7.071	1.961	-9.273	-.727	-2.550	12	.025

was not too significant in percentage, only around 10%. To test the increase in the average score was significant, paired sample t-test was undertaken.

Based on Table 4, the paired sample t-test on leaflets

**Table 5.** Paired samples t-test for pocketbook media

	Paired Differences					t	df	Sig.
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Before - After	-3.889	11.29	2.174	-8.357	-.579	-1.789	26	.085

showed a significant difference in nutrition knowledge perceived by mothers of children under five before and after reading the leaflets. Thus, the leaflets were effective to increase the nutrition knowledge of mothers of children under five.

Table 5 shows that the significance value exceeded 0.05 so that there was no difference in nutritional knowledge perceived by mothers of children under five before and after reading the developed pocketbook. The results illustrated that pocketbook media was not effective in increasing mothers' nutrition knowledge of children under five. The present study's result was not in line, which portrayed that the nutrition knowledge of diabetic patients who received nutritional counselling using booklet media was better than the leaflet media [11]. The advantage of pocketbooks compared to leaflets showed that the information presented was more detailed and precise so that more messages were conveyed [12]. In the implementation of the study, all respondents were present with their children so that the mother's concentration was divided into the activities of caring for their kids. This condition might cause the mother's opportunity to read the materials in the

pocketbook to be shorter and affect the mother's ability to answer the given questions in the posttest.

### 3.3. Response to Nutrition Socialization Media

The responses were needed to determine the feedbacks of the mothers of children under five after using the developed media. The indicators observed included the conformity of the topic with the target, the depth and clarity of the material, and the display of the media (texts and pictures). Table 6 shows the result of the mothers' responses.

**Table 6.** Mothers' responses to the developed leaflet and pocketbook

Indicators	Leaflets (%)			Pocketbook (%)		
	Very good	Good	Fairly good	Very Good	Good	Fairly good
Conformity of the topic with the target	40.0	60.0	0.0	32.1	50.0	14.3
The material depth and clarity	20.0	66.7	13.3	14.3	82.1	3.6
Media display (picture/ illustration suitability with the materials)	6.7	73.3	20.0	35.7	53.6	14.3
Average	22.2	66.7	11.1	27.4	61.9	10.7

Regarding Table 6, in general, leaflets and pocketbooks received a good rating by mothers of children under five, 88.9% 89.3% respectively. The leaflet's media display indicator (the suitability of the image/illustration with the materials) received the highest rating (20%) with reasonably good criteria. The positive response of mothers of children under five to the developed leaflets and pocketbooks could be used to conduct further research with a broader target scope.

## 4. CONCLUSION

Based on the results of data analysis and discussion that has been described, the following conclusions can be drawn: the developed socialization media (e.g. leaflets and pocketbooks) are very valid with a score ranging 0.81 to 0.97; leaflets are proven to be effective to increase mothers' nutrition knowledge, while pocketbook did not significantly increase mothers' nutrition knowledge; and the response of mothers of

children under five to the developed leaflets and pocketbook was outstanding in terms of the suitability of the topic with the target, the depth and clarity of the material, and the display of the media (e.g. texts and pictures/illustrations).

The suggestions from this research are that the media can be tested in a broader target range so that it can be developed as a reference for nutrition education activities for mothers of children under five. The development of nutrition socialization media needs to be expanded with different topics and targets.

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