

# Nutritional Card Media Using Jigsaw Approach to Improve Parenting Patterns Preventing Stunting

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**Abstract**— Foster pattern is one of the factors related to stunting. Parenting counseling Nutrition by using nutritional media in the form of nutrition cards is expected to increase knowledge of the attitudes and actions of mothers and toddlers in providing nutrition which is expected to prevent stunting. The purpose of this study was to look at the influence of the Nutrition Card Media with the jigsaw method approach to improve parenting nutrition to prevent stunting in children at the Tembok Dukuh Surabaya health center.

This research is a quantitative study with a true experiment design research design with a sample of 27 respondents selected by simple random sampling. Data collection techniques using pre-test post test and 2x24 hour questionnaire data were then analyzed using the Wilcoxon test with a 95% confidence level.

The results showed a significant difference ( $P < 0.05$ ) found in the location of the contong square with parenting education intervention using the jigsaw method. While the results of parenting education intervention with the lecture method and demonstration method there were no significant differences ( $P > 0.05$ ) before and after being given the intervention. Thus it can be suggested the use of methods and media is expected to further be more attractive and attractive again in order to improve parenting in infants

**Keywords**— Nutrition Card Media, Jigsaw, Parenting, Stunting

## I. INTRODUCTION

Stunting is part of the impaired growth process and one of the nutritional issues that require attention [1]. Stunting is identified by comparing the height of a child with the children's height standard in a normal population correspond to the same age and sex. A child is considered as stunting if the height is under -2 SD according to WHO standard [2]. A stunted child is a predictor of the poor quality of human resources which is widely accepted, and further could reduce the productive capacity of a nation in the future [3].

In 2016, the prevalence of stunting in toddlers aged 0-59 months was 27.5% (short big was 19% and extremely short was 8.5%). The data of monitoring the nutritional

status (PSG) by the Ministry of Health in 2016 showed the prevalence of stunted toddlers in East Java was 26.1% (short big was 18.6% and extremely short was 7.5%). In Surabaya, the result of monitoring the nutritional status in 2016 showed the prevalence of stunted toddlers was 17.44% (short was 15.52% dan extremely short was 1.92%).

According to the data of Operasi Timbang by Tembok Dukuh Public Health Center in 2016 and 2017 showed the number of stunting sufferers in 2017 was 15.26%. Accordingly, the stunting sufferers in Kelurahan Tembok Dukuh were 11.5% toddlers; 4.5% toddlers in Kelurahan Alun-Alun Contong; and 16.37% toddlers in Kelurahan Jepara. The highest amount of stunted toddlers was in Kelurahan Jepara which spread among several RW, such as RW 2 with 23 %, in RW 6 with 14 %, and in RW 8 as well as RW 1 each 13%.

The nutritional status of toddlers is influenced by the family upbringing because toddlers are still dependent on meeting their food intake and their health care. Besides, the food quality and nutrition depend on the parental feeding style of the family [4]. Other research indicates that a mother with a bad parenting style has a greater chance of the child suffers stunting compare to a mother with a good parenting style [1]. Research also shows the relation of parental feeding style with stunting, where the practice of feeding, psychosocial stimulation, hygiene and sanitation, also utilization of health services have a significant effect on stunting in toddlers [5].

The poor nutritional status will cause stunting, on the other hand over nutritional status will lead to obesity. Nutrition education activities with Focus Group Discussion (FGD) using nutrition card as the media is expected to be able to improve the knowledge about attitudes and actions of nutrition care for toddler's mothers to prevent stunting.

Based on this problem, the researchers are interested in researching: Nutrition Card Media using jigsaw method approach to improve parental feeding style in preventing stunting on children at Tembok Dukuh Public Health Care Surabaya.

**II. MATERIAL AND METHOD**

This research is quantitative research using true experiment design which is by providing treatment to the research subject. Before and after the treatment, the measurement of food intake and parenting patterns on toddler respondents are carried out. The control groups are people who had given extension with lecturing and demonstration method. The population of this research is toddler’s mothers in the working area of Tembok Dukuh Public Health Care.

The sampling technique is using simple random sampling, where the technique is used to get the sample from the population randomly without heeding the level in the population.

There are 27 respondents obtained as the amount of the sample from the whole population that must fulfill these requirements a mother having toddler aged 1-5 years old, will to be the respondent, live on the working area of Tembok Dukuh Public Health Care Surabaya. For the data analysis, the researchers use the one-sample Kolmogorov-Smirnov test for finding out the difference in parenting style before and after given nutrition education using nutrition card media with Jigsaw method.

**III. RESULT AND DISCUSSION**

Nutrition card media is an extension media using cards that contain nutrition information to make the targets easily understand the content. Nutrition cards are able to make conveying the content of the information easier because the targets can both see and discuss the information at the same time using entertaining discussion methods such as Jigsaw method.

The material in the nutrition card aims to improve the knowledge, attitudes, and skills of toddler mothers in parental feeding style which includes parenting styles for child feeding, psychosocial parenting, as well as hygiene and sanitation parenting. This nutrition card is

called Kartu Cerdas Aladin. These cards are made with smile size, waterproof material, not easily damaged, equipped with attractive images and bright colors. The nutrition information is delivered in simple Indonesian.

The training modules could be utilized together with Kartu Cerdas Aladin. The contents of training modules are consisting of parenting style material in correspond with the practice of feeding, psychosocial stimulation, hygiene and sanitation for toddlers.

This module could be used as a guide in playing Kartu Cerdas Aladin for the toddler's mother as well as for the member of Integrated Healthcare Center. The contents of the modules are made using simple and easy to understand language.

The nutrition training modules for facilitators are consist of facilitators guide in assisting the toddler’s mother. These training modules must be understood by the facilitators.

These modules include the type of extension methods such as Jigsaw method, lecture method using PowerPoint media, and demonstration. Focus Group Discussion is discussion activities to discuss the Nutrition Cards such as Kartu Cerdas Aladin, training modules for facilitators, and extension training modules using Jigsaw method, lecturing, and demonstration.

Focus Group Discussion activities involving experts in the field of health promotion and representatives of Integrated Healthcare Center members.

The results include some corrections on Kartu Cerdas Aladin, facilitators training modules, and extension modules to target the toddler's mothers which is by fixing the card material using art paper, the size of the card is made bigger, the language is simplified, and adding colorful images which more represents the message and media’s name: Kartu Cerdas Aladin

**Toddler Food Intake (Energy Intake)**

Table 1: Frequency Distribution of Toddler Energy Intake Before and After Intervention at Kelurahan Alun-Alun Contong Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	4	16	Severe deficit	1	4
Moderate deficit	8	32	Moderate deficit	0	0
Mild deficit	4	16	Mild deficit	6	24
Normal	4	16	Normal	14	56
Excess	5	20	Excess	4	16
<b>Total</b>	<b>25</b>	<b>100</b>	<b>Total</b>	<b>25</b>	<b>100</b>

According to table, it can be inferred that toddler energy intake at kelurahan Alun-Alun Contong before and after intervention experience changes in which before intervention the majority of energy intake falls into

moderate deficit category with 8 toddlers (32%), and after the intervention, the majority of energy intake falls into the normal category with 14 toddlers (56%).

Table 2: Frequency Distribution of Toddler Energy Intake Before and After Intervention at Kelurahan Asem Jaya Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	1	4	Severe deficit	2	8
Moderate deficit	4	16	Moderate deficit	2	8
Mild deficit	8	32	Mild deficit	3	12
Normal	9	36	Normal	16	68
Excess	3	12	Excess	2	8
<b>Total</b>	<b>25</b>	<b>100</b>	<b>Total</b>	<b>25</b>	<b>100</b>

According to table 2, it can be inferred that toddler energy intake at kelurahan Asem Jaya before and after intervention does not experience changes in which

before and after the intervention the majority of energy intake each falls into the normal category with 9 toddlers (36%) and 16 toddlers (68%).

Table 3: Frequency Distribution of Toddler Energy Intake Before and After Intervention at Kelurahan Jepara Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	1	4	Severe deficit	0	0
Moderate deficit	5	20	Moderate deficit	0	0
Mild deficit	10	40	Mild deficit	7	28
Normal	6	24	Normal	14	56
Excess	3	12	Excess	4	16
<b>Total</b>	<b>25</b>	<b>100</b>	<b>Total</b>	<b>25</b>	<b>100</b>

According to table 3, it can be inferred that toddler energy intake at kelurahan Jepara before and after intervention experience changes in which before intervention the majority of energy intake falls into the

mild deficit category with 10 toddlers (40%) and after the intervention, the majority of energy intake falls into the normal category with 14 toddlers (56%).

**Toddler Food Intake (Protein Intake)**

Table 4: Frequency Distribution of Toddler Protein Intake Before and After Intervention at Kelurahan Alun-Alun Contong Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	0	0	Severe deficit	0	0
Moderate deficit	1	4	Moderate deficit	0	0
Mild deficit	0	0	Mild deficit	1	4
Normal	8	32	Normal	10	40
Excess	16	64	Excess	14	56
<b>Total</b>	<b>25</b>	<b>100</b>	<b>Total</b>	<b>25</b>	<b>100</b>

According to table 4, it can be inferred that toddler protein intake at kelurahan Alun-Alun Contong before and after intervention does not experience changes in

which before intervention with 16 toddlers (64%) and after intervention with 14 toddlers (56%), the majority of protein intake both falls into the excess category.

Table 5: Frequency Distribution of Toddler Protein Intake Before and After Intervention at Kelurahan Asem Jaya Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	0	0	Severe deficit	0	0
Moderate deficit	0	0	Moderate deficit	1	4
Mild deficit	0	0	Mild deficit	0	0
Normal	7	28	Normal	8	32
Excess	18	72	Excess	16	64
Total	25	100	Total	25	100

According to table 5, it can be inferred that toddler protein intake at kelurahan Asem Jaya before and after intervention does not experience changes in which

before intervention with 18 toddlers (72%) and after intervention with 16 toddlers (64%), the majority of protein intake both falls into the excess category.

Table 6: Frequency Distribution of Toddler Protein Intake Before and After Intervention at Kelurahan Jepara Surabaya

Before Intervention			After Intervention		
Category	Amount	%	Category	Amount	%
Severe deficit	0	0	Severe deficit	0	0
Moderate deficit	0	0	Moderate deficit	0	0
Mild deficit	2	8	Mild deficit	0	0
Normal	7	28	Normal	7	28
Excess	16	64	Excess	18	72
Total	25	100	Total	25	100

According to table 6, it can be inferred that toddler protein intake at kelurahan Jepara before and after intervention does not experience changes in which before intervention with 16 toddlers (64%) and after intervention with 18 toddlers (72%), the majority of protein intake both falls into the excess category.

**Differences of Parenting Styles Before and After Intervention**

After it is known that the data are homogeneous, a further test is carried out using Wilcoxon Non-Parametric Test to analyze whether there are differences in parenting knowledge before and after the intervention. The test result can be seen in table 7.

Tabel 7: The Results of Wilcoxon Different Test Against Parenting Patterns Before and After Intervention

No.	Location	Intervention	Willcoxon Score
1.	Alun-Alun Contong	Jigsaw Method	0,025
2.	Asem Jaya	Lecturing Method	0,096
3.	Jepara	Demonstration Method	0,334

According to table 7, it can be inferred that interventions with significant result differences ( $P < 0,05$ ) are located at kelurahan Alun-Alun Contong with parenting education intervention using Jigsaw method. Meanwhile, the result of parenting education intervention with lecturing method and demonstration method do not experience significant differences ( $P > 0,05$ ) either before and after the intervention.

**Toddler’s Food Intake Before and After Intervention in Kelurahan Alun-Alun Contong**

The provision of adequate and balanced nutrition is carried out by paying attention to the feeding pattern to get the nutrition intake needed by children. This is

intended in order to maintain and restore children’s health through the nutrients within the food consumed [6]. The result of the research shows that there are significant changes in energy intake before and after the intervention. Before the intervention, the amount of energy intake mostly in the moderate deficit category with 8 toddlers (32%). After the intervention, there is an increase in the number of children as much as 14 toddlers (56%) which fall into the normal category. Nutrition education is an educative approach in order to create individual or community behaviors that are needed to improve or maintain a good level of nutrition [7]. The usage of Jigsaw method is a very cooperative learning method to influence respondents to become



more active in discussing and exchanging opinions among each other so it is easier to understand the given material. According to the research results and theories, the researchers conclude that the increase of energy intake in kelurahan Alun-Alun Contong is caused by learning using Kartu Cerdas Aladin with Jigsaw method which makes the respondents able to easily understand the material presented.

#### ***Toddler's Food Intake Before and After Intervention in Kelurahan Asem Jaya***

The result of the research shows that there are no significant changes in energy intake before and after the intervention. Before the intervention, there are 9 toddlers (36%) that include in the normal category and after the intervention, the number of children increases to 16 toddlers (68%). Moreover, the result also does not show any significant changes in protein intake. Before the intervention, there are 18 toddlers (72%) who fall into the excess category and after intervention later becomes 16 toddlers (64%). Another research shows the relationship between mother's education with children's health and nutritional status. [8]. The purpose of nutrition education as an educative approach is to produce individual and community behavior needed to improve or maintain a good level of nutrition [7]. According to research results and theories, the researchers conclude that the good level of food intake after and before intervention in kelurahan Asem Jaya is caused by the mothers' level of education which enables them to understand parental feeding style extension in choosing the food's ingredients and the nutrient fulfillment. This is also supported by other research that states that a mother's education matters in choosing the food's ingredients and nutrient fulfillment because the higher the level of education, they will put more concern in balancing the nutrition required for the children [9].

#### ***Toddler's Food Intake Before and After Intervention in Kelurahan Jepara***

The result of the research shows that there is a change in energy intake. Before the intervention, there are 10 toddlers (40%) who fall into the mild deficit category and after the intervention, the energy intake of 14 toddlers (56%) fall into the normal category. The result of protein intake mostly falls into exceed category from 16 toddlers (64%) before the intervention to as many as 18 toddlers (72%) after the intervention. The practice of feeding includes educating eating skills, fostering eating habits, fostering the appetite for various types of food, building the ability to be able to choose food for healthiness, and educating proper eating behavior according to each of the cultures. The lack of feeding will result in eating difficulty or lack of appetite which

in turn will have a negative impact on the children's health and development. According to research results and theories, the researchers conclude that the occurrence of good food intake before and after intervention in kelurahan Jepara is caused by the high level of education. This leads to making the respondents easily able to understand about parental feeding style extension in choosing the food's ingredients and the nutrient fulfillment using demonstration method.

#### ***Differences of Parenting Styles Before and After Intervention in Kelurahan Alun-Alun Contong (Media Kartu Cerdas Aladin Media with Jigsaw Method)***

The result of the research shows intervention using parenting materials which include parenting styles of feeding, hygiene and sanitation parenting, and psychosocial parenting using Kartu Cerdas Aladin with Jigsaw method indicates a significant increase. Other research shows that learning through Jigsaw method able to improve activity and enthusiasm for learning. In this method, the toddler's mothers are given maximum chance to show their best performance. The interaction between the toddler's mothers and facilitators as well as the interaction among the toddler's mothers themselves made a positive impact on learning activities [10]. According to research results and theories, it can be known that the increase in the level of parenting knowledge in Kelurahan Alun-Alun Contong is influenced by the media used for the extension. Based on observations, it can be known that the toddler's mothers are way more enthusiastic and able to exchange their knowledge in the group well even though the level of their educations are low. They are also able to remember the given material which is delivered using Kartu Cerdas Aladin media with Jigsaw method.

#### ***Differences of Parenting Styles Before and After Intervention in Kelurahan Asem Jaya (PowerPoint Media with Lecturing Method)***

The result of the research shows intervention using parenting materials which include parenting styles of feeding, hygiene and sanitation parenting, and psychosocial parenting using PowerPoint media with lecturing method indicates no significant increase. Lecturing is the most used extension method because, in its practice, there is an advantage in which it is easy to prepare and in its implementation, it is also effective for the purpose of conveying and understanding the information. However, its weakness lies in how the audience will tend to be passive in the process of learning [11]. According to research results and theories, the researchers conclude that there is no increase in the level of parenting knowledge in Kelurahan Asem Jaya

after being given intervention about parenting extension using PowerPoint media with lecturing method is caused by most of the respondents have a high level of education, in which before the intervention is given, most of them already have adequate knowledge. Besides, the lecturing method is considered passive in the extension because there is only one-way communication happened. The lecturing method with PowerPoint media is therefore considered less effective to increase the knowledge about parenting in Kelurahan Asem Jaya.

#### ***Differences of Parenting Styles Before and After Intervention in Kelurahan Jepara (Demonstration Media with Demonstration Method)***

The result of the research shows intervention using parenting materials which include parenting styles of feeding, hygiene and sanitation parenting, and psychosocial parenting using demonstration media with demonstration method indicates no significant increase. Demonstration is a learning method with demonstrating a particular process, situation, or object being studied. The advantage of this method is making the learning experience clearer and more concrete in order to easily understand what is being learned [12]. The downside is that this method requires special skills. The implementation is not effective if the ones who studied can't see or observe the whole demonstration [13]. According to research results and theories, the researchers conclude that there is no significant increase in parenting extension because the demonstration method can not influence the toddler's mothers so they are less enthusiastic and more focused on talking by themselves instead of paying attention to the information being provided. Less attention during the intervention by respondents may be causing the knowledge not increased.

#### **IV. CONCLUSION**

According to the research result of nutrition card media research with Jigsaw method approach in improving toddler parenting to prevent stunting at the working area of Tembok Dukuh Public Health Center Surabaya can be concluded that by using Kartu Cerdas Aladin media with Jigsaw method at Kelurahan Alun-Alun Contong shows a significant improve ( $P < 0,05$ ). However, parenting education using PowerPoint media with lecturing method at Kelurahan Asem Jaya as well as the use of demonstration media with demonstration method does not show any significant improvement ( $P > 0,05$ ). Energy intake on three kelurahan is increased in which before intervention the energy intake is in deficit and after the intervention the energy intake becomes normal.

There is no change in protein intake before and after the intervention and mostly falls into the excess category.

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