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The Effectiveness of Educational Applications to Prevent Stunting Children (AECAS) on Perceptions of Stunting Prevention

Ika Nurfajriyani[1], Citra Setyo Dwi Andhini[2]
[1,2]*STIKes Mahardika,Indonesia*
ikanurfajriyani@gmail.com

Abstract

As many as 21.9% or 149 million children under five in the world are stunted. Indonesia ranks fifth in the incidence of stunting in the world. The Educational Application to Prevent Stunting Children (AECAS) is a strategy developed to prevent stunting through an Android-based educational application. This study analyzes the effectiveness of the application of the education application to prevent stunting in children (AECAS) on the prevention of stunting. quantitative research with pre and post experimental approach with randomized controlled trial. The sample size in this study was 68 respondents. The average N-gain score for the intervention class (AECAS application method) was 56.98%, included in the moderately effective category, while the booklet method of 13.30% was in the ineffective category. There is a significant difference between the AECAS application method and the booklet method based on the different independent sample t test on the N Gain Score of perceptions of stunting prevention in the intervention and control groups with a p value of 0.0001. the educational application to prevent stunting (AECAS) is effective in preventing stunting by increasing the perception of stunting prevention.

Keywords
stunting prevention; stunting education; AECAS stunting prevention application

I. Introduction

Stunting is a growth problem with the results of measuring height according to the age of children in the age range of 0-59 months based on the provisions of the WHO Child Growth Standards, equal to or below 2 SD (Muche A, Dewau R, 2021). Reducing stunting is the first goal of the 6 Global Nutrition Targets 2025 (WHO, 2021). Stunting affects almost all aspects of a child's development. Stunting that is not handled properly results in decreased cognitive function, metabolic problems, delays in growth, development, and susceptibility to infection (Ekholuenetale M, Barrow A, Ekholuenetale CE, Tudeme G, 2020).

As many as 21.9% or 149 million children under five in the world are stunted. Indonesia ranks fifth in the incidence of stunting in the world. The number of stunting cases in Indonesia in 2019 reached 27.67%, higher than the maximum limit set by WHO, which is 20% (Titaley CR, Ariawan I, Hapsari D, Muasyaroh A, Dibley MJ, 2019). The percentage of very short and short toddlers aged 0-59 months in West Java Province was (11.7%) and (19.4%) (RISKESDAS, 2018). The average incidence of stunting in the city of Cirebon is 13.6%. Pulasaren is a sub-district with stunting cases above the average stunting incidence in the city of Cirebon, which is 20.2%. (Pemkot Cirebon, 2021).

Mother's education and knowledge are the main factors for the high stunting rate in Indonesia (Beal T, Tumilowicz A, Sutrisna A, Izwardy D, Neufeld LM, 2018)

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(Mulyaningsih T, Mohanty I, Widyaningsih V, Gebremedhin TA, Miranti R, Wiyono VH., 2021) (Soekatri MYE, Sandjaja S, Syauqy A, 2020) (Sartika AN, Khoirunnisa M, Meiyetriani E, Ermayani E, Pramesthi IL, Nur Ananda AJ, 2021). Low maternal education results in lack of information on stunting prevention such as breastfeeding, complementary feeding patterns, continuous breastfeeding until the child is 24 months old, and incomplete immunization. The condition of the mother's lack of knowledge will have an impact on behavior. This is supported by other factors such as socio-economic and cultural status (Soekatri MYE, Sandjaja S, Syauqy A, 2020). The results of our previous study showed that 56.7% of toddlers' nutrition was not appropriate (Fadiyah W, Marisa DE, Nurfajriyani I., 2020).

The Indonesian government's effort to overcome stunting is to launch a national strategy program to accelerate stunting prevention in 2018-2024. The program divides the program into 5 pillars involving multi sectoral. One of the main pillars of the program is the fourth pillar, which is about nutrition and food security. Stunting prevention education strategies that have been implemented in Indonesia include education with booklets, videos on youtube, lectures, brainstorming, and discussions (Khoirunisak N, Wulanjari D , 2021) (Sari GM., 2021) (Sukmawati S, Hermayanti Y, Nurhakim F, DA IA, Mediani HS, 2021). The method that has been applied is still not optimal because it cannot be accessed in real time, requires sufficient time and cost so that an intervention strategy is needed to overcome this. Education is a very important human need because education has a duty to prepare Human Resources (HR) for the development of the nation and state (Pradana et al, 2020). According to Astuti et al (2019) Education is an obligation of every human being that must be pursued to hold responsibilities and try to produce progress in knowledge and experience for the lives of every individual. Education is one of the efforts to improve the ability of human intelligence, thus he is able to improve the quality of his life (Saleh and Mujahiddin, 2020). Education is expected to be able to answer all the challenges of the times and be able to foster national generations, so that people become reliable and of high quality, with strong characteristics, clear identities and able to deal with current and future problems (Azhar, 2018). Education and skills are the main keys in gaining social status in community life (Lubis et al, 2019).

The Educational Application to Prevent Stunting Children (AECAS) is a strategy developed to prevent stunting through an Android-based educational application. The application contains stunting prevention materials that are systematically arranged and equipped with pictures and videos. The application is published on the playstore, can be downloaded for free and accessed at any time.

This study aims to analyze the effectiveness of the application of the stunting prevention education application (AECAS) on the prevention of stunting.

II. Research Method

2.1 Study design and settings

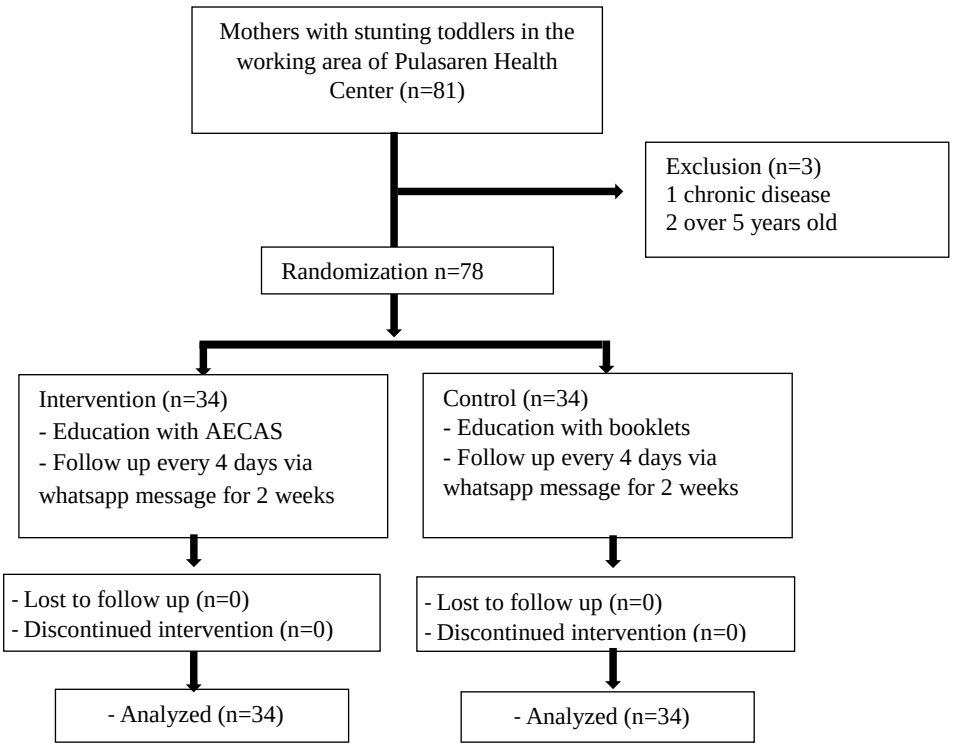
The research method used is a quantitative study with a pre- and post-experimental approach with randomized controlled trials. The percentage of very short and short toddlers aged 0-59 months in West Java Province is (11.7%) and (19.4%) (RISKESDAS, 2020). The average incidence of stunting in the city of Cirebon is 13.6%. Pulasaren is a sub-district with stunting cases above the average stunting incidence in the city of Cirebon, which is 20.2%. This research was carried out in the working area of Pulasaren Health Center on 1-31 August 2022.

2.2 Population and criteria

The population in this study were mothers who had stunting children in the working area of Pulasaren Health Center as many as 81 people. Based on calculations, the sample size in this study was 68 respondents. The inclusion criteria for this study were mothers with stunting toddlers aged 1-5 years in the Pulasaren Health Center working area, mothers and children were in good health. Exclusion criteria in this study were mothers with children with special needs, had chronic diseases, had a history of seizures, and had a history of gemelli births.

2.2 Sampling procedure

The sample in this study was 68 respondents who were determined from a population of 81 people. The inclusion criteria screening was carried out in the population, it was found that 3 respondents did not meet the criteria because 1 person had a chronic disease and 2 people were more than 5 years old. Of the 78 subjects, randomization was carried out to obtain a sample of 68 respondents, then randomization was carried out again to divide the control group into 34 respondents and the treatment group as many as 34 respondents.



2.2 Research Procedure

The pretest assessment in the intervention and control groups was carried out before education. The intervention group was given stunting prevention education through the android-based AECAS application. The AECAS application material refers to the national strategy for accelerating stunting prevention in 2018-2024 on pillar 4. It consists of components of pregnant women's nutrition, early initiation of breastfeeding, colostrum provision, exclusive breastfeeding for 6 months, complementary feeding, and continued breastfeeding for up to 24 months. Follow up is done once every 4 days for 2 weeks via whatsapp message. The control group was given stunting prevention education materials

with the booklet method, followed up every 4 days for 2 weeks via WhatsApp messages. After 2 weeks post-intervention, the intervention and control groups were assessed post-test.

The assessment instrument in this study used a stunting prevention perception questionnaire. This questionnaire consists of 28 questions which were developed based on the theory of the Health Promotion Model. The questionnaire consists of components of previous behavior (prior related behavior), perceived benefits of action (perceived benefits to action), and perceived barriers to action. Validity and reliability tests have been carried out in this study on populations that have similar characteristics to the research group. Of the 34 questions tested, 28 valid questions were obtained. Of the 28 questions, a reliability test was carried out with the result of Cronbach's Alpha value of 0.984.

III. Result and Discussion

Based on this study, it is known that most of the respondents are in the category of early adulthood, namely 20-40 years, in the intervention group as much as 82.4% and in the control group as much as 88.2%. Most of the respondents had high school education, 41.2% in the intervention group and 47.1% in the treatment group (Table 1. Characteristics of Respondents. Most of the respondents worked as housewives, 64.7% in the intervention group and 41.2% in the control group Table 1.

Table 1. Characteristics of Respondents

Characteristics	Intervention		Control		Total	
	n	%	n	%	n	%
Age						
10-19 Years Old	3	8.8	2	5.9	5	7.4
20-40 Years Old	28	82.4	30	88.2	58	85.3
41-60 Years Old	3	8.8	2	5.9	5	7.4
Education						
Junior High School	6	17.6	6	17.6	12	17.6
Senior High School	14	41.2	16	47.1	30	44.1
Diploma/Under Graduate	13	38.2	11	32.4	24	35.3
Graduate	1	2.9	1	2.9	2	2.9
Work						
Housewife	22	64.7	14	41.2	36	52.9
Private sector employee	4	11.8	6	17.6	10	14.7
Government employees	5	14.7	5	14.7	10	14.7
Self-employed	3	8.8	9	26.5	12	17.6

Based on the perception of stunting prevention, most of the respondents before treatment were in the sufficient category, namely 50% in the intervention group and 47.1% in the control group. The perception of stunting prevention after intervention in the intervention group was 55.9 in the very good category, while in the control group the moderate and good category were 32.4% (Table 2)

Table 2. Perceptions of stunting prevention before and after intervention in the intervention and control groups

Category	Intervention		Control		Total	
Before Intervention	n	%	n	%	n	%
Poor	5	14.7	7	20.6	12	17.6
Average	17	50.0	16	47.1	33	48.5
Good	11	32.4	10	29.4	21	30.9
Excellent	1	2.9	1	2.9	2	2.9
After Intervention						
Poor	0	0	3	8.8	3	4.4
Average	4	11.8	18	52.9	22	32.4
Good	11	32.4	11	32.4	22	32.4
Excellent	19	55.9	2	5.9	21	30.9

Hypothesis testing was conducted in this study to determine the effectiveness of the application of stunting prevention education applications (AECAS) on stunting prevention. As a test requirement, the data in this study were first tested for normality and homogeneity tests. Based on the normality test using the one sample Kolmogorov Smirnov test, it was found that all p-values were greater than 0.05 both in the intervention group before and after treatment and in the control group before and after treatment, so it was concluded that all data were normally distributed. The homogeneity test of variance in the pretest group showed a p value of 0.973 greater than 0.05, while the p value in the posttest group of 0.626 was greater than 0.05. Thus, it can be concluded that the data variance in the pretest and posttest groups is the same or homogeneous.

Paired t test was conducted to determine differences in perceptions of stunting prevention in the intervention and control groups both before and after the intervention. The results of the paired t test in the intervention group showed a p value of 0.0001, which means that there were differences in perceptions of stunting prevention in the intervention group, with the pre-test mean value of 72.91 while the post-test mean value of 109.50. In the control group, the paired t test showed a p value of 0.0001, which means that there were differences in perceptions of stunting prevention in the control group both before and after the intervention, with a mean pre-test value of 73.0 and a post-test value of 80.62.

Table 3. Differences in perceptions of stunting prevention in the intervention and control groups

Group	Mean	Std. Deviation	N	Sig.
Pretest Intervention	72.91	19.593	34	0.000
Pretest Intervention	109.50	20.763	34	
Pretest Intervention	73.0	19.405	34	0.000
Pretest Intervention	80.62	19.725	34	

Based on the N-gain score test, the results showed that the average N-gain score for the intervention class (AECAS application method) was 56.98%, included in the category of quite effective. The average N-gain score in the control group (booklet method) was 13.30% in the ineffective category. It can be concluded that the use of the stunting education method with the AECAS application is quite effective in increasing the perception of stunting prevention. Meanwhile, the stunting education method with booklets is not effective in increasing the perception of stunting prevention.

Table 4. Mean Gain Score in the Intervention and Control Group

Class		N	Mean	Std. Deviation	Std. Error Mean
Gainscore	Intervention	34	56.9815	22.50922	3.86030
	control	34	13.3032	12.31851	2.11261

The independent sample t test was then used to determine the difference in the effectiveness of the stunting education method using the AECAS application with the booklet education method on stunting prevention through the perception of stunting prevention. Based on the value of the output table of independent samples t test, it is known that the value of sig. (2 tailed) is 0.0001<0.05, thus it is concluded that there is a significant difference in effectiveness between the use of the AECAS application method and the booklet method to increase the perception of stunting prevention.

Table 5. Results of Different Tests of N Gain Score with Independent sample t test

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df				Lower	Upper
Gain Score	Equal variances assumed	14.804	0.000	9.926	66	0.000	43.67834	4.40057	34.89231	52.46436

There is a significant difference in the stunting prevention education method with the AECAS application with the booklet method. The advantages of using the mobile application method for stunting prevention are that in different socio-cultural communities, people can receive mobile phones that have been widely used, cost-effective, people can access information easily at any time, and have strong community involvement because monitoring can be carried out continuously. Stasya N, Sulistiadi W, 2020). The process of knowledge transfer will be faster if it fulfills the elements of consciously seeing, feeling, entering the thinking process, and occurring over and over again. The AECAS application is effective because information is presented repeatedly with the ease of respondents accessing information, as well as an attractive display equipped with visuals so that it is easily transmitted and received well (Siti KM, Dwi RF, Ernawati1 R, Rahman FF, Milkhatun, Sulistiawan J, et al. 2021).

Stunting is a complex health problem. Prevention must be carried out comprehensively focusing on education, especially education for mothers to break the stunting chain. Mother's knowledge has a significant effect on the nutritional status of children. This is the main factor that must be addressed for stunting prevention (Iftikhar A, Bari A, Bano I, Masood Q., 2017). AECAS contains comprehensive educational materials consisting of components of pregnant women's nutrition, early initiation of breastfeeding, giving colostrum, exclusive breastfeeding for 6 months, complementary feeding, and

continued breastfeeding for up to 24 months, as well as checking nutritional status. Pregnant women who are educated on the nutrition of pregnant women will pay attention to nutrition during their pregnancy so that the growth and development of the fetus is optimal. Then, will give birth to babies with good nutritional status. Mother's readiness in caring for babies who have been educated will have an impact on the effectiveness of early breastfeeding initiation, giving colostrum, and the success of exclusive breastfeeding. Babies who are successful in exclusive breastfeeding and do not experience nutritional problems, will be easier to give proper complementary feeding and advanced breast milk until the age of 24 months. Thus, the baby will be protected from stunting (Goudet SM, Bogin BA, Madise NJ, Griffiths PL, 2019).

IV. Conclusion

The stunting prevention education application (AECAS) is effectively used in comprehensive stunting prevention in the community because this application allows the public to access information repeatedly, cheaply, easy to use, contains comprehensive educational materials.

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