

Increase mother's knowledge about immunization of measles-rubella with AIMMER mobile phone application



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ABSTRACT

Measles and Rubella are infectious diseases that are easy to spread. Measles is very harmful when accompanied by complications of pneumonia, diarrhea, and meningitis. Rubella may cause a miscarriage and may cause Congenital Rubella Syndrome. The use of the Android smartphone as a product of technological advance has made it possible to develop a system that replaces the role of health professionals. This research is aimed at explaining the influence of immunization application (AIMMER) on parents' knowledge of immunization for children of elementary school age. The design used was a pre-post-test control group. Total sample 136 consists of 68 intervention groups and 68 control groups. The intervention group received education on the application of immunization (AIMMER). The control group received the information from public health centers (PHC) with the SOP implemented. The knowledge level of both groups is measured before and one month after the intervention by using a questionnaire. Analysis using the Mann-Whitney test. There is a significant improvement in the intervention group compared to the control group related to the knowledge level of parents on sequel immunization Measles-Rubella ($p=0.001$). It can be concluded that the immunization application (AIMMER) can improve the knowledge of parents on sequel immunization of Measles and Rubella.

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INTRODUCTION

Measles is an infectious disease that is easy to spread caused by the virus and transmitted through coughing and sneezing. (1) Symptoms of measles disease are high fever, redness of the skin (rash) accompanied by cough and/or cold and/or red eyes. (1) Measles disease is very dangerous when accompanied by complications of pneumonia, diarrhea, and meningitis, and can even cause death. (2) (3) Rubella disease is a disease similar to Measles that is also transmitted through the respiratory tract when coughing or sneezing. Rubella is caused by the rubella virus which quickly dies by ultraviolet rays, chemicals, acid icing, and heating. (4)



From 2010 to 2015, there were an estimated 23,164 cases of measles and 30,463 cases of rubella.(5) Measles cases in 2017 in Indonesia are estimated to be 14,640 cases, and in DIY Province 2,186.(6) The number of measles cases in Bantul Regency in 2016 amounted to 124 cases and rose in 2017 to 138 cases. It is known that from existing data on measles immunization coverage in 2014 and 2015 there was a decrease, with the incidence rate of measles disease likely to increase. The percentage of districts with first-dose measles coverage is more than 95% less likely to decrease, from 45% in 2013 to 28% in 2015.(5)

Squele immunization is a basic immunization replay to maintain immunity levels and to extend the protection period of children who have obtained basic immunizations to children under two years old, primary school-age children; and women of childbearing age. Squele immunizations given to primary school-aged children consist of immunizations against measles, tetanus, and diphtheria. Squele immunizations given to primary school-aged children are given in the month of school immunization (BIAS) integrated with the school's health efforts.(7)

High and equitable immunization coverage will form herd immunity and break the chain of transmission of measles and Rubella diseases.(5) With the implementation of Regulation of the Minister of Health of the Republic of Indonesia No. 12 of 2017 on Immunization Implementation, the immunization of BIAS is carried out in grades 1, 2, and 5 elementary schools. Immunizing at school age is an effective strategy to achieve high coverage and prevent outbreaks in schools.(8)

The long-term development focuses on the quality of life of prime human resources, focusing on young people who need care and protection against diseases that can hinder their growth towards high-quality adulthood to continue long-term national development, one of which is protection from measles and rubella disease.

Knowledge can be obtained from formal schools as well as from information from various sources. As well as immunization problems, parents/mothers with high knowledge of immunizations then they will take the action of immunizing advanced measles in their child.(9) Likewise, mothers who have low knowledge then they will not know what should be done to their child, especially immunization problems. This is in line with Yosianty's 2019 research which mentioned that maternal knowledge is related to compliance with measles immunization.(10) The research by Meronika also mentioned the higher the knowledge of the mother so that the implementation of measles immunization is carried out properly and appropriately.(9)

The use of the Android smartphone as a product of technological advance has made it possible to develop a system that replaces the role of health professionals.(11) Seeing this is an opportunity to be used as a medium to improve the knowledge of parents, as well as families about advanced immunizations of elementary school-age children. Considering the results of family support research is the most influential factor in the mother's actions in immunization of advanced measles elementary school children,(12) so this can be an effort in improving family knowledge to support the implementation of the Measles-Rubella immunization program in Indonesia.

Method

This research uses a pre-post-test control group design.(13) The population is all parents who have elementary school children in the working area of Banguntapan Public Health Center (PHC). The sample in this study was parents of elementary school grade 1 students. Large sample calculation using power and sample size calculation application.(14) Referring to Martha et al's research, a large sample of 136 respondents consisted of the intervention group of 68 respondents and a control group of 68 respondents with purposive sampling.(15)

Intervention group in addition to providing information from health workers with media that is usually given from health centers by the standard operational procedure

implemented is also given immunization application media (AIMMER). AIMMER is an Android phone-based application that contains the theory of the concept of Measles and Rubella disease, the concept of basic and advanced immunization, the schedule of basic and advanced immunizations, and the facts and myths surrounding immunization. The menus contained in this application are the theory menu, bibliography, application developer, and instructions about the application. In the intervention group, it was explained how to use the AIMMER application, namely by installing it on an Android cellphone immediately can be used. The control group provides information by the SOP done by PHC. Both groups of respondents measured the rate of advanced immunization of Measles-Rubella (MR) elementary school-aged children before intervention and 1 month after intervention by filling out questionnaires. This research is ethically worthy of the Health Research Ethics Committee of the Poltekkes Kemenkes Yogyakarta with the number e-KEPK/POLKESYO/0361/IV/2020.

The validity and reliability test of the questionnaire on 30 respondents was conducted at Piyungan elementary school which was not used as a research site. Pearson product-moment r correlation test results r value >0.361 and Alpha value 0.757.

Analyze data using the SPSS statistics app version 18. Bivariate analysis using Wilcoxon and Mann-Whitney tests.

Results

The frequency distribution of respondents' characteristics in the study included age, education, and employment. Here's a table of frequency distribution characteristics of research respondents:

Table 1 Characteristics of respondents

Characteristics	Groups			
	Control		Intervention	
	f	%	f	%
Age				
≤ 30 Years	11	16.2	3	4.4
> 30 Years	57	83.8	65	95.6
Education				
Elementary school	2	2.9	0	0
Junior high school	16	23.5	14	20.6
High school	45	55.2	41	60.3
Bachelor	5	7.4	13	19.1
Job				
Housewives	50	73.5	44	64.7
Employees	16	23.5	20	29.4
Civil servants	2	2.9	4	5.9
Total	68		68	

Based on Table 1 of the total study subjects of 136 people, the characteristics of respondents mostly aged > 30 years were 83.8% in the control group and 95.6% in the intervention group. The characteristics of respondents in the control and the intervention group were mostly high school educated 55.2% and 60.3%. In the job categories of control group respondents as well as intervention groups most Housewives 73.5% and 64.7%.

Table 2 Analysis of differences in pre-test and post-test knowledge levels

Knowledge level	Groups					
	Control (n=68)			Intervention (n=68)		
	Pretest	Posttest	p-value	Pretest	Posttest	p-value
X (SD)	9.40(2.42)	9.75(2.62)	0.002	8.96(1.86)	11.21(1.46)	0.000

Median	10.00	10.00	8.00	11.00
Min-max	5-14	5-15	5-15	8-15

Table 2 shows that the average knowledge value in the pre-test control group was 9.40 and the post-test at 9.75. The average knowledge score in the pre-test intervention group was 8.96 and the post-test score was 11.21.

A comparison of increased knowledge about Measles-Rubella immunizations in the intervention group and control group can be seen in Table 3

Table 3 Analysis of differences in knowledge enhancement in control groups and intervention groups

Increased knowledge level	Groups		p-value
	Control (n=68)	Intervention (n=68)	
Median (Min-max)	10.00 (5-15)	11.00 (8-17)	0.001
X (SD)	9.75(2,62)	11.21(1.46)	

Table 3 shows the statistically meaningful difference in knowledge level scores after immunization application (AIMMER) was given to the intervention and control group ($p < 0.05$; $\alpha 0.05$)

Discussion

Based on Table 1, the results of most research respondents aged less than 30 years were 83.8% in the control group and 95.6%. The young mother will be diligent and try to actively fulfill her child's immunization status. They can also obtain information from print media information. While respondents with old age remain diligent and strive to be active, because of the good experience of their child's health, to raise awareness that immunization is important to prevent child pain and death, this is in line with the results of this study.(16) The characteristics of the study respondents based on education were mostly high school educated, namely 55.2% in the control group and 60.3% in the intervention group. High maternal education is expected to increase maternal involvement in healthcare programs. Highly educated mothers are expected to better understand health problems. Besides, with higher education, it is expected that mothers have a higher awareness of handling various health. The results of the study Agushyvana et al concluded that most mothers believe that immunization will cause negative effects on the health of their children. They are afraid that there will be fever after immunization on their children.(17) With good awareness, it is hoped that mothers can drive the motivation to take part in health programs, especially immunizations. This is following the results of the study where at the end of the study there is known to be an increase in meaningful knowledge.(16)

Characteristics based on the work of the control group respondents as well as the intervention group were mostly Housewives at 73.5% and 64.7%. The mother's work will affect the mother's behavior. Working mothers will be busier so no time is included in obtaining information. On the contrary, working mothers have plenty of time to be able to access information and improve their knowledge.(16).

Based on Table 2 it is known that in both groups there was a significant increase in knowledge ($p < 0.05$). This is because both groups get Health Education. The control group got standard immunization education while the intervention group got immunization education with the app.

Based on the different tests table 3 shows a significant difference in knowledge improvement ($p < 0.05$). Known in the intervention group increased respondents' knowledge more than the control group. During the Covid-19 pandemic, basic health services cannot run optimally including in the field of immunization promotion. Today's technological developments affect the maximum health service to support sustainable resource efficiency

and world funding resources. The Android app helps mothers in obtaining information about immunizations, understand the importance of immunization, and will have an effect on trust in vaccination decisions.(18)

This research is in line with Marta's research which shows that utilizing the development of Android smartphone technology can replace the role of an expert in the field of health.(11) Providing information through the app is considered more interesting and informative so that mothers can understand the information well.(15) This can help address the problem of immunization coverage targets in Indonesia, where to increase measles vaccination coverage in Indonesia needs mass health education and an improved health system.(19)

Conclusion

The average pretest knowledge in the intervention group was 8.96 and the post-test average was 11.21 while the average pretest knowledge in the control group was 9.40 and the post-test average was 9.75. The average increase in knowledge in the intervention group was 11.21 and in the control group 9.75. There was a statistically significant increase in maternal knowledge levels of advanced immunizations of Measles-Rubella elementary school-aged children among the intervention group compared to the control group after treatment with immunization application media (AIMMER). This research can be used as a reference for further research to improve the coverage of immunizations.

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