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Female's Reproductive Health Application Design on the School Teacher Knowledge: an Android-Based Learning Media

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Abstract---This study aimed to design a reproductive health application in improving teacher knowledge about adolescent reproductive health as an android-based learning medium and analyze the behavior of assessing an android-based reproductive health application assessment. This research was conducted at Public Junior High School 4 Baubau, Public Junior High School 3 Baubau, and Public Madrasah Tsanawiah (an Islamic Junior High School) Baubau, using a combined method, Research and Development (R & D) and pre-experimental (one group pre-test and post-test design). Educational applications were developed and validated using R & D (Research and Development) developed by Borg and Gall. The pre-experimental research design (one group pre-test and post-test design) determined the improvement in school teachers' knowledge before and after obtaining the educational applications. About 56 teachers were involved as samples by the purposive sampling technique. Later, the data were statistically analyzed by the Wilcoxon Signed Rank Test. There was a difference in knowledge before and after reproductive health education applications (p -value <0.05). Based on learning subjects, science teachers had better knowledge than non-science teachers. Thus, it can be concluded that reproductive health education applications could improve school teachers' knowledge.

Keywords---android applications, knowledge, reproductive health.

Introduction

One of the efforts to improve the quality of life can be made by improving reproductive health services, especially for adolescents who are the future generation of the nation's future generations. In early adolescence, individuals experience a period called puberty. Puberty is a period when individuals begin to be able to carry out sexual and reproductive activities (Steinberg et al., 2017). Adolescence has a very high risk for young women, namely teenage

pregnancy and unsafe abortion, resulting in maternal and child mortality (Nuwamanya et al., 2018). These problems are influenced by various dimensions of life, both from the biological, cognitive, moral, and environmental dimensions. However, the prioritized point is the health status of adolescents (Aninanya et al., 2015).

The problem of abortion in Indonesia is around 2.6 million every year, and 700,000 of the perpetrators are teenagers. According to the United Nations Development Economic And Social Affair. (UNDESA, 2011), Indonesia is the 37th country with a high percentage of young marriages and the second-highest in ASEAN after Cambodia. The Central Statistics Agency released an increase in 2018 of about 1.48% compared to the previous year. Based on these data, young marriage is a problem in Indonesia. All provinces on the islands of Sulawesi and Kalimantan have the highest prevalence of young marriage in the national figure. Specifically, young marriages on the island of Sulawesi range from 14-19% (Ngasuko, 2019). Several studies show that adolescents' sexual and reproductive health and puberty knowledge is minimal, consequences for adolescent reproductive health life due to globalization and lifestyle. Globally, the rate of communicable infections (STIs) that occur in adolescents jumps by a third from 340 million each year, occurring in people under 25 years of age (Bikila et al., 2021).

Seeing these conditions, giving reproductive health education from an early age is a preventive action that can be taken. The earlier adolescents receive reproductive health education. They will have more time to assimilate reproductive health knowledge and have more opportunities to practice controlling behavior (Askelson et al., 2015). One of the parties that can provide reproductive health education to adolescents appropriately is the school. School is an effective place to disseminate information, shape attitudes, and develop skills (Pohan et al., 2011). This is reinforced by research by Guse et al. (2012) which found that reproductive health education provided in schools was associated with delaying sexual behavior and reducing the rate of unwanted pregnancies and sexually transmitted infections (STIs) in various countries. Both studies prove that schools are the right stage to provide an understanding of reproductive health in adolescents. This is also supported by the view of the youth that the proper party to provide reproductive health education is the school (Soleymani et al., 2015).

The provision of reproductive health education in Indonesia is still very minimal. Most students in Indonesia do not have knowledge/understanding of reproductive health because the curriculum for reproductive health education has not been included. This can be seen from a survey on sexual knowledge and reproductive health among junior high school students in urban areas in Indonesia. The results show that only 18%-30% of students have ever received sexual and reproductive health education at school. (SKRRI, 2018). As a preventive measure and the main alternative solution for overcoming student reproductive health problems by providing reproductive health education in schools. This fact makes teachers a more appropriate choice to provide an understanding of reproductive health in adolescents. However, the reality is that teachers have not been able to provide reproductive health education that is appropriate to the needs of students. From the problems above, in implementing reproductive health education in schools, teachers must prepare knowledge and skills in delivering material to facilitate the learning process of their students well (Kusheta et al., 2019).

Preliminary studies through interviews with 6 teachers and several students found that activities regarding reproductive health in schools have not been carried out either from the health office or other institutions. Furthermore, the teachers should prepare knowledge and skills in delivering health education materials to facilitate the learning process of their students good. For this reason, many strategies rely on the use of media to provide education and provide quality information about reproductive health. Smartphones are used as a health promotion medium to provide more comprehensive access to sexual and reproductive health information targeted mainly at young adolescents (Gonsalves et al., 2015). The delivery of information about health education to the public/teachers through mobile devices to provide reproductive health education focuses on the basics of reproductive health. (Browne et al., 2018).

Therefore, this study aimed at adolescent health application design as a learning medium for teachers and as a potential solution to increase their knowledge as competent human resources educators by utilizing an application on an Android smartphone called "KesproPedia." This application was packaged as learning materials, moving animations, audio-visuals, attractive colors, and quizzes on health care materials (Moonsamy et al., 2014; Rastogi et al., 2016). The application created was expected to be easy to use and provided information to increase knowledge about adolescent health care.

Methods

This research was carried out in three different public junior high schools in Baubau, Southeast Sulawesi, from March to April 2021. This research used combined method research, the Research and Development (R&D) method developed by Borg and Gall, and quantitative methods with a quasi-experimental research design (one group pretest-

posttest design). The population in this study were all teachers who worked in three different Public Junior High Schools, about 146 people by purposive sampling technique. This research used inclusion and exclusion criteria. The inclusion criteria were included all teachers at those three schools with a minimum of 2 years working as a teacher, willing to be respondents, willing to communicate well, and having a cell phone accessible to android applications. Exclusion criteria were including respondents moved/retired, sick, and phones damaged. The instruments used in this study were informed consent sheets, expert validation questionnaires, and android-based applications (Guido et al., 2013; Sahar et al., 2019).

The respondent's knowledge pre-test was first carried out to examine the effect of providing women's reproductive health education applications. Furthermore, the intervention was given as an educational application for 30 minutes. After, the knowledge measurement was continued using a post-test questionnaire and a Technology Acceptance Model (TAM) questionnaire to analyzed respondents' acceptance in using the application. The data analysis technique uses computerization with the Statistical Package For The Social Science (SPSS) application version 25. The development of educational application media was analyzed using non-parametric statistics with the Wilcoxon Signed Rank Test to calculate the mean difference between pre-test and post-test scores on the intervention group (Mendola et al., 2008; Fowler et al., 2012).

Result

Knowledge of school teachers before and before being given women's reproductive health education applications.

Table 1
Distribution of knowledge of school teachers before and before being given women's reproductive health education applications

Category	Pre-Test		Post Test		P-Value
	N	%	N	%	
Good	16	28.6	37	66.1	0.000
Enough	32	57.1	19	33.9	
Less	8	14.3	0	0	
Total	56	100.0	56	100.0	

*Wilcoxon test

Based on Table 1, the knowledge of school teachers during the pre-test of 56 respondents, most of the respondents' knowledge was in a good category 32 persons (57.1%). After being given an educational application intervention in the form of a post-test, there was an increase in respondents' knowledge in the good category of 37 persons (69.6%). Those were statistically significant by a p-value <0.05. Knowledge of adolescent school teachers before and after being given reproductive health education applications based on exact and non-exact science subject teachers.

Table 2
Characteristics of knowledge of adolescent school teachers before and after being given reproductive health education applications based on exact science subject teachers

Characteristic	Category	Knowledge level				P-Value
		Pre-Test		Post Test		
		n	%	n	%	
Mathematics	Good	0	0	4	20.0	0.006
	Enough	7	35.0	6	30.0	
	Less	3	15.0	0	0	
Natural Sciences	Good	6	30.0	10	50.0	0.098
	Enough	4	20.0	0	0	
	Less	0	0	0	0	

Total	20	100	20	100
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*Wilcoxon test

Based on Table 2, the knowledge of school teachers based on science subjects during the pre-test of 20 respondents, most of the respondents' knowledge was in the good category in Mathematics 7 persons (35.0%). After being given an educational application intervention in the form of a post-test, there was an increase in respondents' knowledge being a good category in science subjects of 10 persons (50.0%). There was a significant increase in knowledge by the statistical test, particularly in Mathematics subjects (p-value < 0.05), but natural science subjects also increased but not significantly (Maffini et al., 2006; McLachlan et al., 2006).

Table 3
Characteristics of knowledge of adolescent school teachers before and after being given reproductive health education applications based on non-exact subject teachers

Characteristic	Category	Knowledge level				P-Value
		Pre Test		Post Test		
		N	%	N	%	
Islamic Religious Education and Morals	Good	3	8.3	7	19.4	0.147
	Enough	4	11.1	1	2.8	
	Less	1	2.8	0	0	
Civic education	Good	1	2.8	4	11.1	0.041
	Enough	5	13.9	3	8.3	
	Less	1	2.8	0	0	
Indonesian	Good	2	5.6	5	13.9	0.481
	Enough	5	8.9	3	8.3	
	Less	1	2.8	0	0	
Social Sciences	Good	1	2.8	3	8.3	0.276
	Enough	4	11.1	3	8.3	
	Less	1	2.8	0	0	
English	Good	1	2.8	2	5.6	0.197
	Enough	2	5.6	2	5.6	
	Less	1	2.8	0	0	
Counselingguidance	Good	2	5.6	2	5.6	0.317
	Enough	1	2.8	1	2.8	
	Less	0	0	0	0	
Total		36	100	36	100	

*Wilcoxon test

Based on Table 3, school teachers' knowledge based on non-science subjects that were effective during the pre-test, about 36 respondents. Most of the respondents' knowledge was in the sufficient category, particularly in PKN and Indonesian language (Bahasa Indonesia), about 5 (8.9%) of each. After an educational application intervention in the form of a post-test, there was a significant increase in knowledge, particularly PKN subjects (p-value < 0.05), but several other subjects also increased insignificantly (Glasier et al., 2006; Bearinger et al., 2007). The two tables show that science subjects were the dominant knowledge in the good category during the pre-test and post-test.

Discussion

The differences in teacher knowledge about women's reproductive health before and after using the application

Based on Table 3, most respondents' knowledge was in the sufficient category of 32 persons (57.1%). After an educational application intervention in post-test, there was an increase in respondents' knowledge in the good

category of 37 persons (69.6%). Regarding the Wilcoxon test, there was a significant increase in knowledge after this android-based application intervention (p -value <0.05). So, the android applications were more effective in increasing teacher knowledge about women's reproductive health. A significant difference in pre-test and post-test scores means that respondents can use the android application as a source of information about women's reproductive health. According to [Gittings et al. \(2018\)](#) in the world of education, media/materials/learning facilities often use the principle of the cone of experience, which requires learning media such as textbooks, learning materials made by teachers, and "audio-visual." Giving methods that involve hearing can absorb information by 20%, while those involving sight can absorb information by 30%. This theory follows the author's research that respondents with the provision of android applications experienced increased knowledge. This is also in line with research conducted by [Mawardika et al. \(2019\)](#). There is an increase in knowledge about reproductive health after health education in the form of the application of adolescent reproductive health nursing services, which is indicated by a p -value of 0.012. This proves that there is an influence of reproductive health education in application media on adolescent knowledge about reproductive health.

Increased knowledge based on subjects taught by school teachers

In Table 3 it can be seen that the dominant knowledge in the good category was in science subjects with a percentage of 10.7%, followed by other subjects showing an increase in knowledge (p -value <0.05), and other subjects were statistically insignificant (p -value >0.05). In the results of this study, several subject teachers were found significant, insignificant, also constant. This was influenced by several factors, as stated by [Notoatmodjo \(2012\)](#) such as internal factors (education, occupation, age, interests, and experience) and external factors (environment and information).

It does not specifically mention reproductive health education for junior high school level. However, there are areas related to reproductive health. Reproductive knowledge obtained from schools is in Natural Science (in Indonesian: Natural Sciences, abbreviate as IPA) subjects (Ministry of Education and Culture, 2017). Reproductive health material in science lessons is only basic knowledge; the discussion is not in detail and is less applicable to the issues. The expectations of reproductive health education teachers are for children and parents and intensive assistance from health workers ([Karjono et al., 2017](#)). Knowledge obtained from health workers is vital. Unfortunately, many health workers provide counseling in schools to prevent harmful things to control themselves, develop themselves, and behave positively in adolescents. Teachers in schools can provide debriefing, parental education at home, and health workers. Also, teachers can use this application as an intermediary medium for providing information about reproductive health in adolescents.

This follows the research results from [Maulana et al. \(2020\)](#) that one can use android applications and experience increased learning outcomes. In this study, the effectiveness of an effort is the success of a system designed to involve someone actively and independently in learning. The results of the t -test state that there is an effect of android-based learning media users with the learning outcomes obtained.

Conclusion

Android-based women's reproductive health education applications increased the knowledge of school teachers after using the application. This was under the statistical test results of the Wilcoxon signed ranks test showing an average p -value <0.05 , which means a significant difference in knowledge before and after the intervention of reproductive health education applications. Teacher knowledge based on subjects showed that teachers who taught science subjects dominated more in good knowledge than non-science subjects.

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