

## The Effectiveness of Android-Based Applications to Increasing Knowledge of Adolescents on Reproductive Health

Erika Yulita Ichwan, Shentya Fitriana, Diana Hartaty Angraini, Deas Nurul Awaliyah

Poltekkes Kemenkes Jakarta III

E-mail: erika@poltekkesjakarta3.ac.id

### Article history

Posted, Oct 25th, 2019

Reviewed, Feb 25th, 2020

Received, March 10th, 2020

### ABSTRACT

*Adolescence is a transition period with specific needs for growth and development. The reproduction of health education is essential to be given to adolescents because they are susceptible to the risks of reproduction health problems. Giving explanations of health education for adolescents by using media will maximize them in absorbing information since media has become an integral part of adolescents' life. One alternative media that is close and familiar with adolescents is an Android application that can be easily accessed by teenagers who have it through a handphone. The purpose of this study was to know the effectiveness of android based applications at the Central Jakarta Senior High School. The method of this research is a quasi-experimental research with control group design. Sampling by cluster sampling method at SMAN 1 Jakarta as an intervention group and SMAN 5 Jakarta as a control group. Statistical tests using the Paired T-Test, Wilcoxon Test, and Mann Whitney test. The results of the study show what is meant by the knowledge of adolescents with a value of  $p = 0,000$ , so Android application can be applied as a media tool about improving the health of adolescents in schools.*

**Keywords:** *knowledge; android-based applications; reproductive health*

### ABSTRAK

Remaja adalah masa transisi dengan kebutuhan khusus untuk pertumbuhan dan perkembangan mereka. Reproduksi pendidikan kesehatan penting untuk diberikan kepada remaja karena mereka rentan terhadap risiko masalah kesehatan reproduksi. Memberi penjelasan tentang pendidikan kesehatan untuk remaja dengan menggunakan media akan memaksimalkannya dalam menyerap informasi karena media telah menjadi bagian yang tidak terpisahkan dari kehidupan remaja. Salah satu media alternatif yang dekat dan akrab dengan remaja adalah aplikasi Android yang dapat dengan mudah diakses oleh remaja yang memilikinya melalui ponsel. Tujuan dari penelitian ini adalah untuk mengetahui efektivitas aplikasi berbasis android di SMA Jakarta Pusat. Metode penelitian ini adalah penelitian eksperimen semu dengan desain kelompok kontrol tidak merata. Pengambilan sampel dengan metode cluster sampling di SMAN 1 Jakarta sebagai kelompok intervensi dan SMAN 5 Jakarta sebagai kelompok kontrol. Tes statistik menggunakan Paired T-Test, Wilcoxon Test

dan Mann Whitney test. Hasil penelitian menunjukkan apa yang dimaksud dengan pengetahuan remaja dengan nilai  $p = 0,000$ , sehingga aplikasi android dapat diterapkan sebagai alat media untuk meningkatkan kesehatan remaja di sekolah.

**Kata kunci:** pengetahuan; aplikasi android; kesehatan reproduksi

## INTRODUCTION

Adolescence is a transition from childhood to adulthood. During this period, adolescents experience several changes that occur both physically, psychologically, and socially. This transitional period often confronts adolescents with confusing situations, has no definite place, does not belong to the group of children, nor does it belong to the group of adults (Syatiawati, 2017). The various health problems of adolescents in Indonesia are so complicated. The analysis result of the Directorate General of Public Health of the Ministry of Health and the Republic of Indonesia Social Welfare and Social Welfare (2010), shows that the condition of reproductive health in Indonesia today is still not as expected when compared to the situation in other ASEAN countries. Indonesia is still far behind in terms of reproductive health, including adolescent reproductive health (BKKBN, 2012). The World Health Organization (WHO) in 2015 said that throughout the world every year, there are 210 million teenagers who are pregnant. Of that number, 46 million of them had an

abortion. As a result, there are 70,000,000 adolescent deaths due to unsafe abortion, while another 4 million experience pain and disability. In the Southeast Asia region, WHO estimates 4.2 million abortions are carried out each year, and around 750,000 to 1.5 million occur in Indonesia, of which 2,500 of them end in death. Every year there are about 1.7 million births to women under the age of 24, some of which are unwanted pregnancies (Pratiwi, 2017).

The unavailability of accurate and correct information about reproductive health makes adolescents seek access and explore on their own. The flow of communication and information provides experiences for teenagers. Magazines, books, and pornographic films that describe sex without teaching responsibility to lead to noisy sexual behavior (Retnowati, 2012). Teenagers are very vulnerable to health risks, such as disease transmission. This can occur due to a lack of knowledge of reproductive health, as evidenced by the experience of Indonesian youth regarding reproductive health issues, which is still

minimal. Riskesdas data (2013) shows that the percentage of adolescents who get reproductive health education in Indonesia is 25.1%. The same study found that as many as 60.6% of adolescents in DKI Jakarta have not received reproductive health education. This data shows that adolescent knowledge about reproductive health is inadequate. The impact, if not given education about adolescent reproductive health, is easier to do risky sexual behavior. Therefore, reproductive health is significant for adolescents (Deran, 2013). The utilization of multimedia technology is currently very rapidly developing and growing. One of them is the Linux-based Android operating system that is used for cellular phones (mobile) such as smartphones (smartphones) and tablet computers (PDAs). Android provides an open platform for developers to create applications that are used by various mobile devices. Android has now become the most popular mobile operating system in the world (Murya, 2014). Android user

data in Indonesia ranks fifth in the list of the largest smartphone users in the world. Along with the development of technology, the use of Android can also be used as an educational information media for health. Some studies show that the use of technology-based on mobile and internet applications has proven to be effective in increasing public health knowledge and behavior (Faizah, 2013).

## METHOD

This research method is quantitative research, using a quasi-experimental approach, with a control group research design. The research design uses one treatment group and a control group that begins with a pretest given to both groups and then given treatment and then given a posttest to both groups. Sampling with cluster sampling method in SMAN 1 Jakarta as an intervention group and SMAN 5 Jakarta as a control group of 45 respondents each. Statistical tests using the Paired T-Test, Wilcoxon Test, and Mann Whitney test.

## RESULTS AND DISCUSSION

Table 1 Respondents Knowledge about Adolescent Reproductive Health

Group	Average	Min- Max	Standard Deviation (SD)
Pre-test Control Group	70,3	52-87	9
Post-test Control Group	79,9	61-96	7,8

Pre-test Intervention group	69,9	48-87	10
Post-test Intervention group	91	74-100	7,3

Knowledge about reproductive health in 10th-grade teenagers at SMAN 1 and 5 is mostly obtained from the mass media in the form of internet, tv, radio, and social media. For the control group, respondents received information from the mass media about reproductive health by 57.8%, while the intervention group by 44.4%. According to WHO quoted by Notoatmodjo (2012), knowledge can be obtained from education. The level of formal education is the basis of intellectual knowledge possessed by someone. Apart from the level of formal education, information outside of formal education obtained individually, such as social media, electronic media, and information from the internet, can also affect one's level of knowledge. Budiman's theory (2013) says that learning is influenced by education, information/mass media, socio-economic culture, environment, experience, and age. This is consistent with Ekayana's research (2011) that mass media, such as the internet, is used as one source of information that many adolescents access and use. During the current development of technology and information, it is possible for all groups that can access the internet, including

students or, in this case, teenagers. But often the internet has a dangerous impact on teenagers who accidentally get information from websites when surfing or getting e-mails containing pornographic content, without knowing the adverse effects of such deviant behavior. The results showed that there was a significant influence on watching porn movies/videos on internet media with abnormal behavior. It can be concluded that all respondents had received information on reproductive health. However, most respondents did not yet know the complete information regarding handling reproductive health. Some information that has been obtained is only necessary knowledge. Adolescents need to recognize fully about reproductive health so that the knowledge acquired can influence adolescent behavior not to engage in free sex or juvenile delinquency behavior.

Respondents get application media and lectures so that a learning process occurs where something that doesn't know turns into know and from not understanding to understanding. This is in line with the theory of learning that an attempt to acquire new things in behavior includes

knowledge, skills, skills, and values with one's psychiatric activities. According to Notoatmodjo (2012), more information can influence or add to one's knowledge and with knowledge raises awareness that eventually someone will behave and behave according to the knowledge possessed. The lecture method, according to Susilowati (2016), is one way to explain or explain an idea, understanding, or message verbally to a group of listeners accompanied by discussion and question and answer to increase the knowledge of a

group. The results of other studies also showed a significant increase in knowledge scores on the lecture method ( $p < 0.5$ ) counseling on the lecture method was more effective than the demonstration method in increasing dental and oral health knowledge. The results of the study using the lecture method on reproductive health had an influence on the level of adolescent reproductive health knowledge in the control group due to an average increase of 70.3 in the pretest and in the post-test data the average knowledge score was 79.9.

Table 2. Android Application Assessment on Adolescent Reproductive Health

<b>Application Assessment</b>	<b>Frequency (f)</b>	<b>Percentage (%)</b>
Good	42	93,3
Less	3	6,7
<b>Score</b>	<b>19</b>	<b>100,0</b>

Based on table 2, it can be seen that 93.3% of respondents rated the Android app as useful because the Android application can be easily understood. After all, its use is simple, and its contents are interesting to read, can easily access reproductive health information and can be used as an alternative to reproductive health learning while there are 6.7% of respondents rated the android application to be ineffective because the font or font size is too small and the information is not complete enough.

Android application is an application that, in an Android-based mobile phone, can be used even if the user moves easily from one place to another without interruption or interruption of communication. Android application is one of the electronic learning that can be used as an alternative educational media in facilitating access to information and knowledge. This is consistent with the results of research from Muyaroah et al. (2017) that students can use the Android application and experience an increase in learning

outcomes. The effectiveness referred to in this study is the success of an effort from a system designed to involve students actively and independently in learning. T-test results state that there is an effective use of Android-based learning media with student learning outcomes. Research conducted by Prabowo (2016) is that students can use Android applications and experience an increase in learning outcomes. This shows that the provision of android applications on reproductive health as a medium for learning reproductive health also influences the level of knowledge of adolescent reproductive health because an average increase is obtained at the time of the pretest 69.9 and on the post-test data the average knowledge score becomes 91.

Android applications can be effective because teenagers in Indonesia due to rapid technological developments so that mobile phones are now the primary source of information among adolescents. According to the latest data, at least 30 million children and adolescents in Indonesia are internet users, and digital media is currently the primary choice of communication channels they use. The use of social and digital media has become an integral part of the daily lives of young Indonesians. The study found that 98 percent of the children and adolescents surveyed knew about the internet and that 79.5 percent of them were internet users (Kominformo, 2014).

Table 3. Level of Youth Knowledge about Reproductive Health with Lecture Method Without Giving an Android Application

<b>Group</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>SE</b>	<b>P-value</b>
Pre Test and Post Test control group	45	79,96	7,084	1.163	0,000

Based on table 3, it can be seen that the collective knowledge of adolescent reproductive health after being given a lecture and not being given an application is 79.96, with a standard deviation of

7.063 and a p-value of 0,000. Thus it can be concluded that there is an influence of giving lectures on adolescent reproductive health to increase knowledge of adolescent reproductive health in the control group.

Table 4. Level of Adolescent Knowledge About Reproductive Health by Giving an Android Application Regarding Adolescent Reproductive Health

<b>Group</b>	<b>N</b>	<b>Positive rank</b>	<b>Ties</b>	<b>Negative rank</b>	<b>Z</b>	<b>P-value</b>
Pre Test dan Post Test Intervention group	45	45	0	0	5,851	0,000

Based on table 4, the Wilcoxon test results are obtained, aiming to determine the effect of the android application on increasing adolescent knowledge about reproductive health in the intervention group. A positive rank value of 45 means that the post-test value is higher than the pre-test value, there is no equal value between pre-test and post-test (ties = 0), and no post-test value is lower than the pretest value. The Z is 5,851, and the p-value is 0,000. Thus it can be concluded that there is an effect of providing android

applications to increase adolescent knowledge about reproductive health in the intervention group. After the Wilcoxon Test in the intervention group and paired T-test in the control group to determine the effect of the android application on increasing adolescent knowledge about reproductive health, Mann Whitney Test was then performed. This test was conducted to determine differences in young knowledge about reproductive health between the intervention group and the control group.

Table 5. Differences in the Average Knowledge of Reproductive Health Control Groups and Intervention Groups

	<b>Group</b>	<b>N</b>	<b>Mean Rank</b>	<b>Sum of Ranks</b>	<b>Mann Whitney</b>	<b>P-value</b>
Reproductive Health Knowledge	Control group	45	29,99	1349,50	314,500	0,000
	Intervention group	45	61,01	2745,5		

Based on the Mann Whitney test results, it is known that the p-value is 0,000. Mean rank 29.99 in the control group and mean rank 61.01 in the intervention group. Thus it can be concluded that there are differences in adolescent knowledge about

reproductive health between the intervention group and the control group so that the provision of android applications is more effective in increasing adolescent awareness about reproductive health. The significant difference in the

pre-test and post-test scores can be interpreted that respondents can use the android application as a source of information about adolescent reproductive health. The increase in post-test scores determines the amount of material received by respondents. According to Edgar Dale, in the world of education, the use of media/learning materials/tools often uses the Cone Experience principle that requires learning media such as textbooks, learning materials made by instructors, and audio-visual. Another source stated that the effectiveness of the media on understanding the target, which is visually 3.5 times better than verbally (Susilowati, 2016). Assessment of the application obtained a good rating that is as much as 93.3% of respondents felt that the use of this application is easy and simple, can increase health insight reproduction, the contents are interesting to read and can be alternative media for learning about reproductive health.

Android application about reproductive health that is applied in digital or mobile phones is one of the strategies in health education that functions as an intermediary in delivering information in the form of health messages. In this study, there was a significant increase because teenagers enjoyed the material provided in the

application. Reproductive health android application contains simple information, according to the needs of students/teens who are relatively young. With the increase in knowledge before and after the provision of android applications strengthen that the application is beneficial for teens to increase understanding. Learning with Android-based learning media makes students happier in learning because it is packed with interesting images, easy to understand language, and students can learn anytime and anywhere.

Android-based learning media has several advantages. Namely, this media has an attractive design appearance, both in terms of color, text, images, and information. This media is easy to operate, understood, and easily understood by students; the buttons in this media can function adequately according to the instructions for using the media. Another advantage is that this media can be used independently both in school and outside of school. This is following research from Hasjiandito (2014), which shows that learning based on blended learning can improve adolescent knowledge so that it can be concluded that android applications about reproductive health adolescents are effective and can be used for information dissemination. As a health promotion

medium, because it is a fun learning medium and because it is visual, it can help the process of observation, recognition, and memory.

## CONCLUSION

There is an increase in adolescent knowledge about reproductive health, and there are differences in knowledge before and after given the android application. Android application is more effective in increasing adolescent reproductive health knowledge of adolescents in schools.

## REFERENCE

- Bany ZU, Sunnati, Darman W. 2014. Perbandingan Efektifitas Penyuluhan Metode Ceramah dan Demonstrasi Terhadap Pengetahuan Kesehatan Gigi dan Mulut Siswa SD. *Cakradonya Dental Journal* 6(1):661–6.
- BKKBN (Badan Kependudukan dan Keluarga Berencana Nasional). 2012. *Kurikulum dan Modul Pelatihan Pengelolaan Pusat Informasi dan Konseling Kesehatan Reproduksi Remaja (PIK-KRR)*. Jakarta: Badan Koordinasi Keluarga Berencana Nasional.
- Budiman, Riyanto A. 2013. *Kapita Selekta Kuisisioner Pengetahuan Dan Sikap Dalam Penelitian Kesehatan*. Jakarta: Salemba Medika.
- Deran HM, Budiati T. 2013. Tingkat Pengetahuan Kesehatan Reproduksi Remaja Yang Diberikan Oleh Konselor Sebaya Di SMAN 5 Bekasi. *Skripsi*. FIK Universitas Indonesia.
- Ekayana A. G. 2011. Pemanfaatan Internet Sebagai Salah Satu Sumber Belajar Siswa dan Guru di Jurusan Teknik Elektronika SMK Negeri 2 Depok Sleman. *Thesis*. Universitas Negeri Yogyakarta.
- Faizah D. 2013. Gerakan Nasional Sadar Gizi Pada Seribu Hari Pertama Kehidupan: Saatnya Memanfaatkan Teknologi Mobile dan Internet. *Jurnal Ilmiah Mahasiswa Kedokteran Indonesia* 2 (1), 1-4.
- Murya Y. 2014. *Pemrograman Android Black Box*. Jasakom.
- Muyaroah S, Fajartia M. 2017. Pengembangan Media Pembelajaran Berbasis Android dengan menggunakan Aplikasi Adobe Flash CS 6 pada Mata Pelajaran Biologi. *Innov J Curric Educ Technol*. 6(2):79–83. Available from: <https://journal.unnes.ac.id/sju/index.php/ujet/article/view/19336>
- Notoatmodjo, S. 2012. *Promosi Kesehatan Dan Perilaku Kesehatan*. Jakarta: Rineka Cipta; 2012.
- Prabowo dkk. 2016. Efektivitas Aplikasi Berbasis Android Menggunakan Api Gesture Untuk Mengenal Aksara Korea. *Jurnal Penelitian Tindakan Kelas* 17(2):74–82.
- Pratiwi L. 2017. Pengaruh Lingkungan Pergaulan Sekolah dan Dukungan Keluarga Terhadap Sikap Kesehatan Reproduksi Siswa – Siswi Di Kelas X SMK Budi Tresna Muhammadiyah Kabupaten Cirebon. *Thesis*. Universitas Padjajaran.

Retnowati. 2012. *Remaja dan Permasalahannya*. Yogyakarta: Fakultas Psikologi UGM.

Susilowati D. 2016. *Promosi Kesehatan*. Jakarta: Kementerian Kesehatan Republik Indonesia.

Syatiawati N, Respati T, Rosadya DS. 2017. Efektivitas Metode Promosi Kesehatan dalam Meningkatkan Pengetahuan Tentang Kesehatan Reproduksi Siswa SMP Negeri. *Bandung Meeting on Global Medicine & Health (BaMGMH)* 1(1):42-8.