



Research Article

The effectiveness of giving Android-based applications as promotional media in improving COVID-19 preventive behavior in the community

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ABSTRACT

Public understanding of COVID-19 is the main focus to break the chain of spread. The massive spread of the virus shows the lack of public knowledge about preventing transmission. The best way to prevent and slow down transmission is to get information about COVID-19. There are still limited promotional media in providing health education in the community, especially Android-based applications. The purpose of this study was to determine the effect of giving an Android-based application as a promotional medium in improving COVID-19 prevention behavior in the community. This study used a pre-experimental research design with one group pre-test and post-test design. The population is all people in the Mulyorejo village amounted to 22.862 and taken samples of 193 people using a non-probability purposive sampling technique with the respondent criteria aged 31-45 years. The knowledge questionnaire consisted of 20 statements and the attitude questionnaire with 18 statements. The statistical test uses the Wilcoxon Signed Rank Test to find out differences in knowledge and uses the Chi-Square Test to find out differences in attitudes. The results of knowledge have increased from pre-test sufficient knowledge (52.8%) and post-test good knowledge (80.3%) using the Wilcoxon signed rank test $p=0.000<0.05$. The results of attitudes have increased from pre-test negative attitudes (63.2%) and post-test positive attitudes (76.2%) using the Chi-square test $p=0.000<0.05$. The conclusion is that there is an effect of giving Android-based applications as a promotional medium in improving COVID-19 prevention behavior in the community.



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INTRODUCTION

Since 2019, the world has been rocked by the COVID-19 Pandemic which started in Wuhan, Hubei, China, and on March 11 2020 WHO declared that COVID-19 had become a worldwide pandemic (Bedford et al., 2020). The importance of public understanding of COVID-19 is the main focus to break the chain of spread because until now there has been no proven effective drug or vaccine (Prompetchara et al., 2020). The massive spread of the virus shows the lack of public knowledge about preventing the transmission of COVID-19 (Jaga et al., 2020).

Data on the distribution of COVID-19 based on the WHO report as of January 25, 2021, Global as many as 224 countries, confirmed 98,794,942 patients and 2,124,193 died. Positive COVID-19 in Indonesia as of January 25 2021 as many as 999,256 people, 809,488 recovered, and 28,132 died (WHO, 2021). The increase in COVID-19 sufferers in Indonesia from day to day shows the lack of public knowledge caused by the implementation of providing health education to the public about COVID-19 which has not been carried out optimally (Djalante et al., 2020).

Our public health in dealing with COVID-19 is highly dependent on social approaches and behavior change as strategies to stop transmission (Eaton & Kalichman, 2020). Intrapersonal factors namely changes in individual behavior as a preventive basis in preventing the transmission of COVID-19 (Lotfi et al., 2020). *The World Health Organization* (WHO) states that the best way to prevent and slow down transmission is to obtain information about SARS-CoV-2, the disease it causes, and how it spreads (Gray et al., 2020). Reduce the morbidity and mortality of COVID-19 by breaking the chain

of transmission, prevention activities are very important to break the chain of transmission of COVID-19 (Jaga et al., 2020). Prevention of the transmission of COVID-19 can be conveyed through the provision of health education. Education is an effort of persuasion or learning to the community so that they are willing to take actions (practices) to maintain (solve problems) and improve their health (Timmers et al., 2020).

With advances in software and mobile technology, mobile applications have become an important element in everyday life. The use of the mHealth application makes health information easily accessible (Ming et al., 2020). Health education efforts need an attractive strategy to be easily accepted, one of which is health education with Android-based media (Iyengar et al., 2020). The provision of Android-based health education media as an alternative to promotive efforts to overcome the lack of COVID-19 prevention behavior. The digital era is access that can be used as a learning method to provide knowledge about COVID-19 because the access is affordable and easy to operate (Faezipour & Abuzneid, 2020). The researcher aims to determine the effect of giving an Android-based application on increasing COVID-19 prevention behavior in the community.

METHOD

This study uses a *pre-experimental design* with one type of research, namely *one group pre-test-post-test design*. This research was conducted by giving a *pretest* before the intervention, after that the intervention was given, then a *posttest* (final observation) was carried out. In this study, the population was the entire community in the Mulyorejo village amounted to 22,862, and took samples of 193 people using a non-probability purposive sampling technique with the inclusion criteria. The knowledge



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questionnaire consisted of 20 statements and the attitude questionnaire with 18 statements. The statistical test used the Wilcoxon Signed Rank Test to determine the difference in knowledge before and after the intervention and used the Chi-Square Test to determine the difference in attitudes before and after the intervention. This research was conducted for 2 months from March to May 2021. The ethical clearance from Health Research Ethics Committee Faculty of Nursing Universitas Airlangga. Ethical Approval No: 2180-KEPK.

Researchers tested the data using the Wilcoxon Sign Rank Test and Chi-Square (Pre-Post) statistics in the SPSS 25.00 program on one sample to compare the influence between the independent variable and the dependent variable with ordinal and nominal data scales and the level of significance $\alpha \leq 0.05$ means that if the results of statistical tests show $\alpha \leq$

0.05, then there is a significant effect between the independent variable and the dependent variable.

Inclusion criteria: 1) People compos mentis consciousness and stable vital signs; 2) People aged 31-45 years (highest age confirmed positive for COVID-19); 3) People who own and can use Android smartphones. Exclusion criteria: 1) People have severe cognitive impairment; 2) People are sick.

RESULTS

The distribution of respondents by gender, age, and education level is presented in Table 1. The distribution of knowledge on the prevention of COVID-19 before and after giving Android-based applications in 2021 is presented in Table 2. The distribution of attitudes on prevention of COVID-19 before and after giving Android-based applications in 2021 is presented in Table 3.

Table 1. Distribution of respondents by gender, age, and education level

No	Respondent Characteristics	N	%
1	Gender		
	a. Male	106	54.9
	b. Female	87	45.1
	Amount	193	100
2.	Age		
	a. 31-38 year	115	59.6
	b. 39-45 year	78	40.4
	Amount	193	100
3	Education Level		
	a. No school	5	2.6
	b. Primary school	16	8.3
	c. Junior High School	54	28
	d. Senior High School	93	48.1
	e. Under Graduate	25	13
	Amount	193	100



Tabel 2. Distribution of knowledge on the prevention of COVID-19 before and after giving Android-based applications in 2021

Knowledge	Pre Test		Post Test	
	N	%	N	%
Good	43	22.3	155	80.3
Enough	102	52.8	38	19.7
Not enough	48	24.9	0	0
Amount	193	100	193	100

$\rho = 0.000 < \alpha = 0.05$
Wilcoxon Signed Rank Test

Table 3. Distribution of attitudes on prevention of COVID-19 before and after giving Android-based applications in 2021

Attitude	Pre Test		Post Test	
	N	%	N	%
Positive	71	36.8	147	76.2
Negative	122	63.2	46	23.8
Amount	193	100	193	100

$\rho = 0.000 < \alpha = 0.05$
Chi Square

DISCUSSION

Application Development for Android-Based Health Education Media Applications

Compilation of the development of an Android-based health education application regarding the prevention of COVID-19 in the community in the working area of the Mulyorejo Health Center by finding strategic issues presented in FGDs with professional health workers at the health center. This strategic issue was obtained from the results of filling out a questionnaire evaluation sheet regarding the implementation system of health education interventions at the Mulyorejo Health Center Surabaya, as well as evaluating community knowledge and attitudes toward COVID-19 prevention. The results of the FGD showed that there were several strategic issues raised, including: the implementation of health education is still not optimal for all communities, the methods used are one-

way and conventional and there is a risk of COVID-19 transmission if gathering mass or explaining directly orally to the community without social distancing, the media used is still limited due to the risk of transmission if distributing leaflets or media in paper form, the material provided is not planned, current health education carried out by the health center is delivered orally using loudspeakers with a mobile ambulance or when the community comes to the health center, there is no effective media in providing health education that minimizes the risk of COVID-19 transmission, most of the respondents show sufficient and insufficient knowledge and negative attitudes regarding the prevention of COVID-19 disease, this is because the community almost never gets Health education related to the prevention of COVID-19 from the health center, the public gets information from social media and mass media whose truth is not guaranteed.

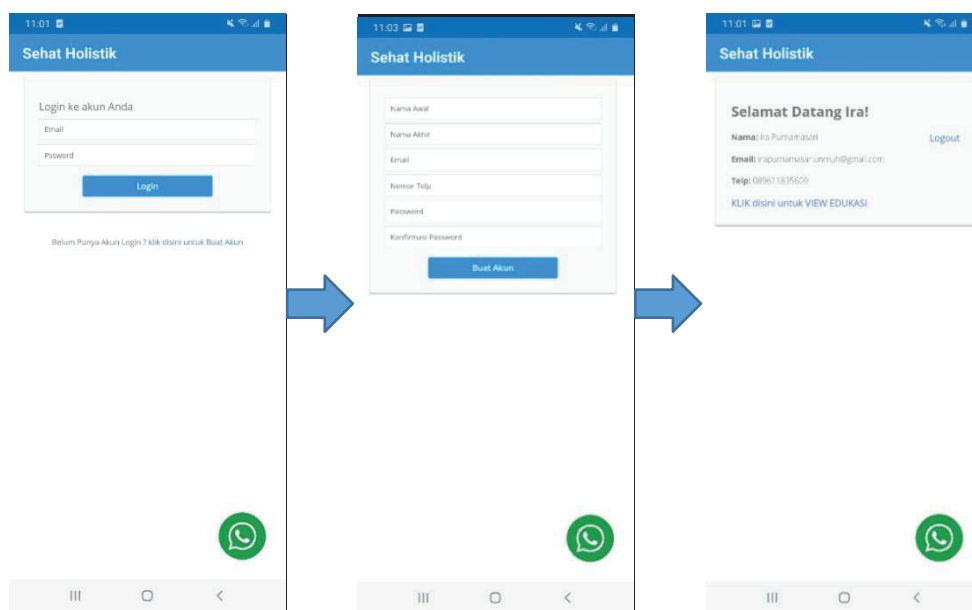


Along with the development and advancement of technology, many applications in smartphones can be used as a medium for providing health education to improve health behavior (Timmers et al., 2020). The successful implementation of a *mobile health* application supports health workers by providing education about COVID-19, self-assessment, and the ability to monitor their health (Timmers et al., 2020).

Researchers developed an Android-based health education media application based on the results of literature studies, FGDs, and expert consultations. Recommendations from the FGD for efforts to improve community behavior toward preventing COVID-19 by developing an effective and efficient method, easy to obtain and easy to do, to provide information to the public on the importance of preventing the transmission of COVID-19. The

interactive application of how to prevent COVID-19 is deemed appropriate to meet the needs of health education and improvement of preventive behavior by considering the risk of COVID-19 transmission. The development designed by the researcher was presented and offered to the respondents. This application is an Android-based application that can be installed on smartphones up to Android version 9. This application is already available on the *google play store*, by searching by typing “*Sehat Holistik*” and can be downloaded for free with a memory size that is not too large. This application contains information about COVID-19, understanding the disease, clinical signs and symptoms of the disease, modes of transmission, and methods of disease prevention. The link to download this application <https://play.google.com/store/apps/details?id=com.sehatholistik.sehatholistik>

1) Registration Menu





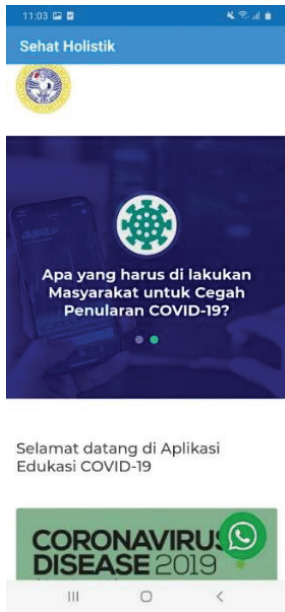
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2) Health education and interactive discussion menu





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Knowledge of COVID-19 Prevention Before and After Giving Android-Based Applications

Based on the research conducted, shows that the results of respondents' knowledge of preventing COVID-19 before being given an android-based application intervention were mostly classified as sufficient knowledge (52.8%), and after being given the intervention most were classified as good knowledge (80.3%).

This knowledge includes general knowledge about the meaning of disease, clinical signs and symptoms, vaccinations, modes of disease transmission, and COVID-19 prevention behavior. Knowledge is a guide in shaping one's actions (Alrasheedy et al., 2021). Knowledge is the result of knowing, which occurs after people sense certain objects, sensing occurs through the human senses, namely the senses of sight, hearing, smell, taste, and touch. Most of the knowledge is obtained from the eyes and ears. Knowledge is a guide in shaping one's actions. Knowledge can be categorized as good, sufficient, and lacking (Jaga et al., 2020). This level of knowledge can be influenced by several factors, including the education level of most respondents and having a secondary education background related to the ability to seek and understand information (Nursalam, 2017).

Low knowledge can make it difficult for someone to form behavior because knowledge or cognition is a very important domain in shaping a person's actions that are influenced by the learning process. Behavior that is based on knowledge will be more lasting than behavior that is not based on knowledge (Lee et al., 2021).

Health education interventions are defined as helping patients gain the knowledge, skills, tools, and confidence to be active in their care so that they can achieve their self-identified health goals (Gray et al., 2020). Along with the

development and advancement of technology, many applications in smartphones can be used as a medium for providing health education to improve health behavior (Timmers et al., 2020). The successful implementation of a *mobile health* application supports health workers by providing education about COVID-19, self-assessment, and the ability to monitor their health (Timmers et al., 2020).

Based on the description above, the knowledge before the intervention was given was sufficient, and after the intervention was classified as good because one of the factors that influenced the success of health education was the media used to convey messages. If there is no media, the results achieved in health education are less than optimal. In this study, the media used was an Android-based application so when the researcher explained COVID-19 while showing how to download and use an Android-based application. The application is easy to access and easy to operate so that respondents can maximize the functions of their Android or smartphone.

The Attitude of COVID-19 Prevention Before and After Giving Android-Based Applications

Based on the research conducted, showed that the results of respondents' attitudes towards preventing COVID-19 before being given an android-based application intervention were mostly classified as negative attitudes (63.2%), and after being given the intervention most were classified as positive attitudes (76.2%).

A person's negative attitude can be influenced by social attitudes because social attitudes are formed from the social interactions experienced by individuals. Social interaction means more than just social contact and relationships between individuals as members of social groups. In social interaction, there is a mutually influencing relationship between



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individuals with one another, there is a reciprocal relationship that also affects the behavior patterns of each individual as a member of society (Azwar, 2015). This is following Allport's (1954) opinion that attitude is a kind of readiness to react to an object in certain ways. The readiness in question is a potential tendency to react in a certain way when an individual is faced with a stimulus that requires a response. After someone knows the stimulus or object, the next process will assess or behave towards the stimulus or health object. A person's negative attitude toward an object is a feeling of being *unfavorable* or *unfavorable* to the object (Alrasheedy et al., 2021).

Based on the description above, the attitude before the intervention was classified as negative, and after the intervention was classified as positive because one of the influencing factors, namely knowledge, could affect a person's attitude. In addition to knowledge, the methods or methods used in conveying messages or programs also affect a person's attitude change.

Limitations of the study: 1) Android-based health education applications cannot be used on patients who do not have an Android-based smartphone; 2) The reach of users of this Android-based health education application is young adults aged 31-45 years; 3) This application is designed with an online system so that it requires a connection to the internet to use and optimize its functions.

CONCLUSION

There is an effect of giving Android-based applications to the improvement of COVID-19 prevention behavior in the community, which can be seen in the results of the pre-test and post-test of the respondents.

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