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The Effectiveness of Educational Videos on Knowledge, Perception, and Anxiety About COVID-19 Vaccination

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Article Info

Abstract

Background: The vaccination program is the main focus of handling COVID-19 at this time. Insufficient knowledge, poor perceptions, and high levels of anxiety can affect the success of the COVID-19 vaccination program. Health education is an option for overcoming these problems. Aims: This study was to find out the effect of health education through videos on knowledge, perception and anxiety in the community in the selected area In Indonesia.

Method: Research used a quasi-experimental with a pretest-posttest control group. The sample consisted of the control and intervention groups, with 221 samples each taken by accidental sampling. This research was conducted in July-September 2021. The intervention provided was a health education video about COVID-19 vaccination for 13.27 minutes. The instrument consists of a self-reported questionnaire. Bivariate data test used Wilcoxon Signed Ranks Test and Mann Whitney.

Result: The control group showed decreasing knowledge score of 1.0, an increased perception score of 0.4, and an anxiety score of 0.1. The group showed increased knowledge and perception scores (6.0 and 4.0), while the Anxiety score also decreased by 13.8. The pretest and posttest tests of the control group showed knowledge (p=0.0060), perception (p=0.202), and anxiety (p=0.659). The pretest and posttest of the intervention group for all variables showed p<0.001. The posttest difference test for all variables between the control and intervention groups was p<0.001.

Conclusions: Health education through video effectively increases knowledge and perception and reduces anxiety about COVID-19 vaccination

INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is still a global pandemic. The incidence of COVID-19 in the world on March 2, 2022, was 440,807,756 cases and 5,978,096 deaths. Europe contributed the highest number of COVID-19 cases with 181,275,264, followed by America with 147,655,931 cases. Southeast Asia ranks third for COVID-19 cases with 56,001,277 (World Health Organization, 2022). The COVID-19 situation in Indonesia on March 6, 2022, was known to be 5,748,725 cases; the number of deaths was 150,172 and 475,951 active cases (Ministry of Republic Indonesia, 2022).

The main focus of handling COVID-19 is currently providing vaccinations. The number of vaccine recipients worldwide on February 26, 2022, was 10,585,766,316 (World Health Organization, 2022). The target number of vaccine recipients in Indonesia is 208,265,720. On March 6, 2022, many vaccine recipients, as many as 19,003,490, received the first dose, 147,858,311 received the second dose, and 12,405,103 received the third vaccine (Ministry of Republic Indonesia, 2022). At the beginning of the COVID-19 vaccination program, the incidence of anxiety tends to be high, significantly when increasing the Delta variant (Awijen et al., 2022). Research in Indonesia by Fadlilah et al. with 503 respondents showed that all respondents experienced anxiety about COVID-19 vaccination; as many as 76.7% experienced mild anxiety, 22.3% moderate anxiety and 1.0% severe anxiety (Fadlilah, Setiawan, Murdhiono, et al., 2022). Research reports show that anxiety occurs because of concerns about side effects and a lack of knowledge about the vaccine's effectiveness (Yigit et al., 2021). There is a significant correlation between knowledge and vaccination anxiety (Ilahi & Aulia, 2021). Besides knowledge, community perception factors are associated with vaccination anxiety levels (Herdyana & Komariyah, 2021).

Research in Bangladesh shows insufficient knowledge of the COVID-19 vaccine, with a score of 2.83 ± 1.48 (out of 5), so health education programs need to be started immediately before mass vaccination is scheduled (Islam et al., 2021). This cross-sectional analysis shows that education is urgent. Required to increase public knowledge and awareness about the COVID-19 vaccine to reduce the adverse effects of lack of knowledge in decision-making for COVID-19 vaccination (Hammour et al., 2022).

Health education is proven to increase knowledge perception and impact by reducing anxiety. Health education has been shown to improve knowledge, attitudes, anxiety and mental health perceptions in the population in India during the COVID-19 pandemic (Roy et al., 2020). The health education method using short video media effectively increases knowledge, perception and resilience in the face of the COVID-19 crisis (Kaim et al., 2020). However, the publication of research on health education through video to increase knowledge and perception and reduce anxiety about COVID-19 vaccination has not been found. The population very quickly accepts health education via video in Indonesia. Several studies have found that videos can help promote vaccines and various health problems (Kaim et al., 2020; Pakpahan, 2021; Ruhmadi et al., 2014). Therefore, it is necessary to publish research results that prove scientific. This article describes one of the efforts to support the success of the COVID-19 vaccination program by increasing knowledge, increasing perception, and reducing anxiety by providing education.

METHODS
Study Design

A quasi-experimental method is used in this study with a non-equivalent control group pre-posttest design. This research was conducted in July-September 2021 in Depok, Sleman, Yogyakarta, Indonesia. The independent variable of the study was the provision of education using video. The dependent variable is the knowledge, perception, and anxiety of residents facing COVID-19 vaccination.

Samples

The research population is residents in Depok, Sleman, Yogyakarta, Indonesia January to June of 2021, with as many as 123,853 people. Sample calculation using the Slovin formula,

$$n = \frac{N}{N\,(d^2) + 1}$$

With details n=number of samples; N=number of the population; d=precision, the researchers used 5%. The sample calculation results in the minimum number of samples, 399 people. The sample in the study was 442 people who were evenly divided into two control and intervention groups. Each group amounted to 221 samples. Samples are residents who meet the inclusion and exclusion criteria. Inclusion criteria are minimum primary education, age 17-59 years old, having a family, not being a health worker, and being willing to be respondents. The exclusion criteria were attending health education about COVID-19 vaccination and undergoing mental disorders treatment. The sampling process used accidental sampling and placing samples in groups using simple random sampling. The sample takes a lottery containing the writings of the control or intervention group and then enters according to the papers accepted.

Instruments

The research instrument consisted of videos, counselling program units, knowledge, perception, and anxiety questionnaires. Researchers made the video about COVID-19 vaccination, the adoption of the material from the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/ Menkes/4638/2021 concerning "Technical Guidelines for Vaccination Implementation in the Context of Combating the Corona Virus Disease 2019 (COVID-19) Pandemic" (Ministry of Republic Indonesia, 2021), and has 13.27 minutes. The aspects of the COVID-19 vaccination presented consisted of definitions, types of vaccines, objectives, benefits, follow-up events after immunization, handling of post-immunization co-occurrence, and COVID-19 vaccination procedures. The researcher prepared the knowledge questionnaire consisting of definitions, types of vaccines, objectives, benefits, follow-up events after immunization, handling of post-immunization co-occurrence, and COVID-19 vaccination procedure. The knowledge questionnaire, according to the intervention video with 20 statements. Respondents chose "True" and "False" answers for each statement. Researchers compiled their perception questionnaire about COVID-19 vaccination, totalling ten statements. The perception questionnaire consists of three aspects: cognitive, affective, and psychomotor. The answer choices for the perception questionnaire using the Guttman Scale are "Yes" and "No". Test the validity of the knowledge and perception questionnaires using an expert test on three expert nurses, namely medical-surgical nurses, mental nurses, and community nurses. The average value of the validity test was 0.85 (≥0.75), meaning that the questionnaire is feasible to use.

The instrument regarding anxiety about COVID-19 vaccination uses the D'Prinzessin (2021) research questionnaire adoption, with the title, "The relationship between the level of knowledge about COVID-19 and the level of stress and anxiety in pharmacy students at the University of North Sumatra class 2017". The questionnaire consists of 20 statements with four answer choices: none, light, moderate, and heavy. The answer is no if the respondent does not feel (score 0), the answer is light if the respondent thinks but does not bother (score 1), and the answer is moderate if the respondent thinks and sometimes makes him uncomfortable (score 2). The answer is heavy if the respondent thinks continuously and feels very disturbed (score 3). The validity of the questionnaire was tested on 49 respondents using Cronbach's Alpha. All statement items show the results of rcount > rtable (rcount > 0.282). The reliability test results obtained an Alpha value of 0.923, which indicates that the instrument's reliability is extraordinary.

Data Collection

As many as ten research assistants helped researchers during the data collection process, they explained the entire research process and signed a letter of willingness. The control group did not get any intervention during the study. Data collection for the control group was initially carried out in July 2021. Data collection for the intervention group was completed after the control group was finished in August and September 2021. The intervention group received health education about COVID-19 vaccination via video. The stages of health education intervention by video in this study

consisted of; the first stage, second stage and third stage. In the first stage, the researcher explained the main content and the length of time and filled out the pre-test questionnaire, ending with a test of the sound and appearance of the video. In the second, the researcher invited the respondents to observe the video until it was finished. Respondents view videos through laptops or cellphones. The researcher allows the respondent to ask questions if there are things that need to be explained. In the third, the respondents filled out the posttest questionnaire immediately after their education ended. The data collection process is carried out face to face by following the protocol to prevent the spread of COVID-19. The protocol uses standardised masks and hand sanitisers and maintains a minimum distance of 1 meter. The education provision in the intervention group was not carried out all at once but was divided into several sub-groups to reach 221 people. The number of respondents for each education time is 2-8 people. For fairness to all respondents, the control group also received Health Education after the data collection in the intervention group. Education Activities for the control group were conducted in the first week of October 2021.

Data Analysis and Ethical Consideration

The research was conducted after obtaining ethical approval from the Ethics Commission of Universitas Respati Yogyakarta number 073.3/FIKES/OL/IV/2021. All respondents received an explanation of the objectives, benefits, and process of the research. The researcher explained that respondents had the right to cancel their participation in the study if they felt uncomfortable or disadvantaged. Respondents who agreed and were willing to become respondents signed the informed consent as a legal aspect of the research process. Respondent data were tested without showing their identity to maintain the confidentiality of the research subjects. The results of the study were analyzed using SPSS 21 software. The response rate in this study was 100%. Normality test using Kolmogorov Smirnov with not customarily distributed results ($p < 0.05$). Univariate data presentation using frequency distribution. The relationship between respondent characteristics and the dependent variable used the Mann-Whitney U test for data that were not normally distributed and the Kruskal Wallis test for normally distributed data. The pretest-posttest data for each group was tested using the Wilcoxon Signed Ranks Test. The difference test between the control and intervention groups using Mann Whitney. The probability value is declared significant if it is smaller than the alpha value of 0.05.

RESULTS AND DISCUSSIONS
Distribution characteristics of the respondent

Table 1. showed that most respondents in the control and intervention groups were women, namely 69.2% and 62.4%. Respondents in the late adolescence category dominated both groups, 41.6% and 82.4%. In the control group, most respondents did not work (57.5%), and the intervention group showed the opposite result; most respondents were workers (52.5%).

Table 1 Distribution Characteristics of Respondent (N=442)

	Variables f (%)	Control Group f (%)	Intervention Group F (%)	Total
Gender	Male	68 (30.8)	83 (37.6)	151 (34.2)
	Female	153 (69.2)	138 (62.4)	291 (65.8)
Age	Early adolescence	34 (15.4)	13 (5.9)	47 (10.6)
	Late adolescence	92 (41.6)	182 (82.4)	274 (62.0)
	Early adult	53 (24.0)	10 (4.5)	63 (14.3)
	Middle adult	33 (14.9)	10 (4.5)	43 (9.7)
	Late adult	9 (4.1)	6 (2.7)	15 (3.4)
Work's	Yes	94 (42.5)	116 (52.5)	210 (47.5)
	No	127 (57.5)	105 (47.5)	232 (52.5)

Relationship of Respondents' Characteristics with Knowledge, Perception, and Anxiety of the Community Facing COVID-19 Vaccination

Table 2 results from a bivariate test of respondents' characteristics with independent variables at the pretest for the entire group. The results showed that gender was unrelated to respondents' knowledge and perceptions about COVID-19 vaccination (p=0.100 and p=0.858). Gender significantly correlated with respondents' anxiety about COVID-19 vaccination (p=0.027). Respondent's age was related to knowledge and anxiety about COVID-19 vaccination (p=0.001 and p=0.010), but not perception (p=0.347). The respondent's profession was not associated with knowledge, perception, and anxiety about COVID-19 vaccination (p=0.191, p=0.666, and p=0.010).

Table 2 Relationship of Respondents Characteristics with Knowledge, Perception, and Anxiety of the Community Facing COVID-19 Vaccination (N=442)

Variables		F (%) Mean±SD	Knowledge		Perception		Anxiety	
			p	Mean±SD	p	Mean±SD	p	Mean±SD
Gender	Male	151 (34.2)		12.15±4.15		3.77±2.20		24.27±7.09
	Female	291 (65.8)	0.100[†]	12.89±4.29	0.858[†]	3.74±2.25	0.027[†]	23.99±6.29
Age	Early adolescence	47 (10.6)		11.94±3.96		3.62±2.53		25.51±6.20
	Late adolescence	274 (62.0)		13.20±4.01		3.74±2.15		23.16±6.61
	Early adult	63 (14.3)	0.001[*]	11.29±4.90	0.347[*]	3.43±2.12	0.010[*]	26.03±6.24
	Middle adult	43 (9.7)		11.67±4.42		4.16±2.40		25.21±6.44
	Late adult	15 (3.4)		12.87±4.49		4.47±2.64		25.33±6.34
Work's	Yes	210 (47.5)		12.94±4.16		3.79±2.31		24.31±7.03
	No	232 (52.5)	0.191[†]	12.35±4.32	0.666[†]	3.77±2.16	0.513[†]	23.89±6.14

F=frequency; p=p-value; SD=Standard Deviation; [†]tested using Mann-Whitney U Test; [*]tested using Kruskal Wallis Test

Intragroup and Intergroup Comparison in term of Effect Knowledge, Perception, and Anxiety

Table 3 shows a difference between pretest and posttest knowledge (p=0.006). This difference can be seen from the decrease in respondents' knowledge during the posttest. The results showed no difference in perception (p=0.202) and anxiety (p=0.659) at the pretest and posttest. There was an increase in the mean perception and respondents' anxiety during the posttest. Different results were seen in the intervention group; providing education through video was effective in increasing respondents' knowledge (p<0.001), growing good perceptions about COVID-19 vaccination (p<0.001), and reducing anxiety about COVID-19 vaccination (p<0.001). There was an increase in the average knowledge and perception during the posttest (6.0 and 4.0), while the respondent's anxiety decreased (13.8). Table 3 also shows the pretest's homogeneity test of knowledge, perception, and anxiety between the control and intervention groups showed p>0.05. The results show that the data of the two groups are homogeneous. The results of the comparison between the control and intervention groups showed that there were differences in knowledge, perception, and anxiety (p<0.001). The results reinforce that education effectively increases knowledge and perception and reduces anxiety about COVID-19 vaccination.

Table 3 Effect of Educational Video on Knowledge, Perception, and Anxiety of the Community Facing COVID-19 Vaccination (N=442)

Variables	Control Group				Intervention Group			
	Pretest Mean±SD	Posttest Mean±SD	Δ Mean	p‡	Pretest Mean±SD	Posttest Mean±SD	Δ Mean	p‡
Knowledge	10.3±4.2	9.4±3.1	-1.0	0.006	11.3±2.8	17.3±2.9	6.0	<.001
Perception	3.8±2.4	4.2±2.3	0.4	0.202	3.7±2.1	7.7±1.4	4.0	<.001
Anxiety	27.0±5.1	27.1±5.8	0.1	0.659	26.2±6.6	12.4±4.4	-13.8	<.001

Homogenity test of knowledge pretest among control-intervention group p=0.324
Homogenity test of perception pretest among control-intervention group p=0.970
Homogenity test of anxiety pretest among control-intervention group p=0.186
The Mean Difference of knowledge posttest between control and intervention group (*7.0, p<.001#*)
The Mean Difference of perception posttest between control and intervention group (*3.6, p<.001#*)
The Mean Difference of anxiety posttest between control and intervention group (*13.9, p<.001#*)
p=p-value; SD=Standard Deviation; Δ = Difference posttest-pretest; ‡Testes using Wilcoxon Signed Ranks Test #Tested using Mann Whitney

The study results show that education using videos effectively increase knowledge about COVID-19 vaccination. The results of the study are in line with previous research that health education increases students' knowledge of COVID-19 (Fadlilah, Nekada, et al., 2022; Kaim et al., 2021; Noprianty et al., 2021). These studies have the same health education topic for COVID-19 vaccination but have differences. The method of health education is the first difference; this study provides direct education using videos according to the issue, while Noprianty et al. use online talk shows and Fadlilah et al. use PowerPoint presentation media done online. The next difference is the research participants; this study uses a broad and diverse community as a sample, while the previous research uses school students. This study measures two other aspects besides knowledge, namely perception and anxiety; previous studies only measure knowledge.

In this study, age was a factor related to knowledge about COVID-19. The study results follow Hammour et al. age is related to knowledge of the COVID-19 vaccine (Hammour et al., 2022). The results differ from this study in the respondent's work; Hammour et al. found work related to understanding COVID-19 vaccines, and health workers showed good knowledge of vaccines. Meanwhile, this study shows no relationship between work and learning about the COVID-19 vaccine. The results also showed that gender was not related to knowledge about the COVID-19 vaccine, in line with Islam et al. finding no relationship between age and

knowledge of respondents (Islam et al., 2021). The study results differ from Sari & Widayanti's gender and occupation with knowledge of the COVID-19 vaccine (Sari, 2021).

Public knowledge is an essential key to the success of the COVID-19 vaccination. Previous studies reported uncertainty and rejection of a vaccine due to a lack of information or wrong information in the mass media (Bianco et al., 2019). Research in China stated that respondents delayed vaccination because they did not know vaccine safety (Wang et al., 2020). The existence of knowledge causes respondents to have good information about the COVID-19 vaccine so that the impact will be to accept the vaccination program and be willing to be vaccinated. Previous studies have shown that knowledge is related to participation in the COVID-19 vaccine (Fukuda et al., 2021; McAbee et al., 2021; Mohamed et al., 2021).

The study results also show that health education affects respondents' perceptions of COVID-19 vaccination. The health education provided increases with the respondents' good perception of the COVID-19 vaccine. Researchers have not found research on the effect of health education on perceptions of the COVID-19 vaccine. Still, the results align with the study of Sukesi et al. and Wisanti et al. that health education changes public perception (Sukesi et al., 2021; Wisanti et al., 2020). The difference lies in the research topic by Sukesi et al. about the perception of dengue hemorrhagic fever control, and educational methods are divided into several stages. The educational

method used and the issue of the material also make a difference; Wisanti et al.'s research on smoking habits and positive interaction methods.

The results showed that the respondent's gender, age, and occupation were unrelated to the patient's perception of the COVID-19 vaccination. Different things were found in the study of Syan et al. that age, gender, and education were related to the perception of the COVID-19 vaccine (Syan et al., 2021). Good perceptions are primarily found in females, adult age, and higher education. The research of Wulandari et al. also found a relationship between age and gender in the perception of the COVID-19 vaccine (Wulandari et al., 2021). The difference in results in the sample using health workers. Research in Bangladesh by Islam et al. that women have a better perception of the COVID-19 vaccine than men (Islam et al., 2021).

One's perception of a topic influences one's behaviour. A good perception will motivate someone to agree or behave as expected and vice versa. Regarding the COVID-19 vaccination, a good perception of the COVID-19 vaccine dramatically influences a person's willingness to participate in the vaccination program. Following the research results in Malaysia by Mohamed et al., a reasonable perception indicates good participation in the vaccination program (Mohamed et al., 2021). Another study in Botswana by Tlaleid et al. found that good public perception increased public confidence in following the vaccine (Tlale et al., 2022). Research in Nigeria also shows positive perceptions of COVID-19 vaccination related to vaccine acceptance (Josiah & Kantaris, 2021).

Another study found that health education reduced respondents' anxiety about the COVID-19 vaccination. Research by Fadlilah et al. stated that all respondents experienced anxiety when facing COVID-19 vaccination, ranging from mild to moderate (Fadlilah, Setiawan, Muflih, et al., 2022). This anxiety can interfere with the program before, during, and after vaccination. Anxiety results in low participation and physical complaints due to anxiety (Gotlib et al., 2021). The study results align with Meriem et al.; health education reduces the anxiety of the elderly facing the

transmission of COVID-19 (Syamson & Nurdin, 2021). The research of Al Hayek et al. found that educational programs reduced patients' mental health problems such as anxiety and depression (Al Hayek et al., 2013).

The results showed that the patient's anxiety was related to age and gender. The study results align with Santomauro et al.; women and older are at risk of experiencing more anxiety than other groups. Women are more prone to anxiety because social and economic factors more easily influence women (Burki, 2020). The reaction that arises from anxiety about the Covid-19 vaccination will undoubtedly disrupt the vaccination process. People prone to anxiety may experience interference with immunisation because of the stress they cause. Disturbances can occur before, during, or after the vaccination process.

This study has several weaknesses and strengths; the research questionnaire is not a standard questionnaire but was developed based on information about COVID-19 from the WHO website and the Ministry of Health of the Republic of Indonesia. Validity testing has been used to increase the reliability of our study. Educational videos are made attractively by paying attention to the material's content presented in a simple and easy-to-understand manner. Another limitation is the imbalance in the number of male and female respondents, which may affect the research results. The study also involved a relatively large number of respondents, aiming to get a good representative sample. However, this study has limitations that cannot be ignored. Measurement of data through self-reported questionnaires allows for memory bias.

CONCLUSION

The results showed no differences in the control group respondents' perceptions and anxiety during the pretest and posttest. The control group also showed decreasing respondents' knowledge at the posttest. The study's results prove that providing education through video effectively increases public understanding and perception about COVID-19 vaccination and reduces anxiety when facing COVID-19 vaccination. Providing the correct information is crucial to expanding

the vaccination program's success against COVID-19. The central and local governments are expected to increase knowledge about COVID-19 vaccinations through print or electronic media. The provision of Health Education using other methods can be investigated as a comparison of the results of this study. Further research can examine the condition of nursing interventions for respondents who experience anxiety while waiting for the vaccination process. Other researchers are also advised to conduct research by considering the balance of the number of male and female respondents.

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