

## Research Article

# The Effect of Health Education-based Telenursing on the Public Knowledge of COVID-19 Preventive Strategies in the Elderly with Type II DM

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**ORCID**Sri Wahyuni Adriani: <https://orcid.org/0000-0002-0628-8848>**Abstract.**

Preventative efforts taken by the elderly with diabetes mellitus against COVID-19 are a balanced diet, routine activities, taking regular medication, and vaccinations. Health education is very important during the pandemic. This study aimed to identify the effect of telenursing-based health education on knowledge about COVID-19 prevention strategies in the elderly with comorbid diabetes mellitus. This study was a pre-experiment with a pre-test-post-test one-group design. The population in this study were all randomly selected communities consisting of students and practitioners with a total sampling technique of 150 people. The results of the paired sample t-test have a difference of two means. The average difference in knowledge before education was 33.16, while the average knowledge after attending the education was 71.72. The average difference in knowledge before and after joining the education was 38.56, and the p-value was 0.0005. There is a difference in knowledge before and after attending a health education, which means that the public knowledge about COVID-19 preventive strategies in the elderly with type II diabetes mellitus is better after being given health education. Health education based in technology or telenursing is the right way to promote health by increasing knowledge in the pandemic era.

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## 1. Introduction

Currently, the health problem that is a big concern is Covid-19. The World Health Organization (WHO) explained Coronavirus Disease 2019 (COVID-19) for the symptoms of a type of coronavirus disease. This disease is a type of infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This virus attacks the respiratory system and is associated with the 2002-2003 outbreak of severe acute respiratory syndrome coronavirus 1 (SARS-CoV-1). [1]. On March 11, 2020, WHO declared Covid-19 as a global pandemic. At that time, the corona virus had spread in 118 countries and infected more than 121,000 people in Asia, Europe, the Middle East and America.

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At 2021, COVID-19 had infected more than 118.5 million people with 2.631.295 deaths (WHO).

Covid-19 cases in Indonesia until July 2021 were reaching 2.417.788 cases, deaths reaching 63.760 people, and recovering cases of 1.994.573 people [2]. Jember is one of the regencies in East Java which has several confirmed positive COVID-19 cases reaching 7.838 people, 554 deaths, 6.898 recovered cases, and 386 cases under treatment [3].

The Covid-19 Handling Task Force has asked people who live with the elderly to be more vigilant. This is because the elderly are a vulnerable group that dominates the death rate of Covid-19. According to data from the Covid-19 Handling Task Force, around 5-19% of elderly people affected by Covid-19 are declared dead. This is due to the high comorbidity or congenital disease in the elderly and the decreased immunity with age.

In the five provinces (in Java), the highest percentage of deaths occurred in the elderly age group. The five provinces on the island of Java recorded the highest number of Covid-19 patient deaths. The five provinces, namely West Java, rose 463 percent, DKI Jakarta increased 236 percent, DI Yogyakarta increased 148 percent, East Java increased 145 percent, and Central Java increased 75 percent. According to data from the Indonesian Covid-19 Handling Acceleration Task Force, the most common comorbidities in patients with COVID-19 were Hypertension and Diabetes Mellitus (DM), with the percentage of each case being 51.1% for hypertension and 34.8% for DM, followed by data on 3 other comorbidities that emerged including heart disease (18.5%), chronic obstructive pulmonary disease (8.5%), kidney (5.6%), and cancer (1.5%).

Diabetes is a chronic disease that occurs when the pancreas does not produce enough insulin or when the body cannot use insulin effectively. This condition causes hyperglycemia, which is a common result of uncontrolled diabetes. The impact of hyperglycemia that occurs from time to time can cause damage to various body systems, especially nerves and blood vessels. Complications of DM that often occur include the main cause of kidney failure, diabetic retinopathy, neuropathy (nerve damage) in the feet which increases the incidence of foot ulcers, infection, and even the need for a leg amputation [4]. DM disease management is known as four main pillars consisting of education, medical nutrition therapy, physical exercise or physical activity, and pharmacological intervention. The four management pillars can be applied to all types of DM [5], [6]. Either type 1 or type 2 diabetes can cause an increase in blood glucose. High blood glucose in the blood can worsen existing diseases, including Covid-19. This

is because high blood sugar affects the ability of the virus to infect a person. Diabetes also increases the risk of inflammation and worsens the immune system [7].

Similar conclusions were drawn from a study which found that 24 Covid-19 patients without other comorbidities but with diabetes were at higher risk for severe pneumonia, enzyme release associated with tissue injury, inflammatory response, and dysregulation of glucose metabolism. In addition, serum levels of inflammation-associated biomarkers such as IL-6, c-reactive protein, serum ferritin, and coagulation index, D-dimer, were significantly higher, in diabetic patients compared to those without diabetes. This shows that patients with diabetes are more prone to inflammation which in turn leads to a faster risk of Covid-19 [8], [9].

In this extraordinary pandemic, it is necessary to disseminate the information so that community people, especially the elderly with comorbid diabetes mellitus, understand what, why, and how the attitudes and actions must be taken so as not to be infected but also not to transmit it to others. One way is to conduct socialization as widely as possible so that people have sufficient knowledge, understand and behave as they should. Socialization can be published in various forms of health education such as seminars, scientific discussions, videos, modules, posters, booklets, and so on. The purpose of this study was to analyze the effect of health education based on telenursing on knowledge about COVID-19 preventive strategies in the elderly with type 2 diabetes mellitus.

## 2. Materials and methods

This study uses quantitative research with the type of pre-experimental research with a pretest-posttest one-group design approach by giving treatment to all respondents. The public is given educational interventions about COVID-19 preventive strategies for the elderly with comorbid diabetes mellitus through the Zoom Meeting application. This research was conducted in July 2021. The population in this study was the entire community which was randomly selected consisting of students and practitioners with a total of 150 people.

Determination of the sample in this study is by total sampling. The sample used in this study were 150 respondents. The instrument used in this research is an electronic pre-posttest questionnaire that contains 15 questions and each question has a score of 6 with a score of the highest 90 when all questions are answered correctly. The questions are adapted from the Ministry of Health's 2020 COVID-19 prevention and

control guidelines. Participants can answer questions using the google form application. Education is carried out through zoom meetings.

TABLE 1: Materials and presenters at health education events through telenursing.

Theory	Delivered by	Time
Covid-19, Risks for the Elderly with DM and Vaccination	Doctor	20 minutes
Covid-19 Health Protocol	Nurse Practioner	20 minutes
A balanced diet, light activity, and the use of herbal plants to increase immunity	Nurse Practioner	20 minutes

The media used in delivering the material is PowerPoint media which is displayed through a zoom meeting. The material presented can be seen in table 1. In addition, this education video shows the prevention of COVID-19 in the elderly with comorbid Diabetes Mellitus. This 5-minute video explains the elderly with diabetes mellitus and efforts to prevent the transmission of COVID-19.

### 3. RESULTS

#### 3.1. Characteristics of Respondents

The characteristics of respondents based on age, gender, and occupation can be seen in table 2.

TABLE 2: Characteristics of Respondents (n=150).

Variable		Respondents (n=150)	
		n	Percentage (%)
Age	17-25 years old	124	82.7%
	26-35 years old	21	14%
	36-45 years old	5	3.3%
Gender	Man	60	40%
	Woman	90	60%
Work	Student	105	70%
	Practitioner	45	30%

Based on table 2, it is known that most of the people who participate in health education were aged 17-25 years old, most respondents were women, and most were students.

### 3.2. Telenursing-Based Health Education

From the results of the normality test using the Kolmogorov Smirnov test, the results of the data are normally distributed.

TABLE 3: Results of Analysis Before and After Telenursing-Based Health Education.

Variable	Pre Test	Post Test	Different Mean	Std Deviation	95% Confidence interval of the different		t	p-value
					Lower	Upper		
Knowledge level	33.16	71.72	-38.5	19,801	-41,755	-35,365	-43.851	0.0005

The results of the analysis in table 3 show that the results of the paired sample t-test have a difference of two means. The average public knowledge after telenursing-based health education about COVID-19 preventive strategies in the elderly with type 2 diabetes mellitus has increased.

After implementing telenursing about COVID-19 preventive strategies in the elderly with type 2 diabetes mellitus, it can be stated that participants know about COVID-19 and the risks to the elderly with type 2 DM, prevention and transmission of Covid-19 infection, both by washing hands properly, wearing masks and physical distancing of at least 1 meter, avoiding crowds, limiting mobilization and vaccination, the average respondent gets an average score of 71.72 from a total of 90 points. From the pre-test scores, most people do not know about the Covid-19 preventive strategy. However, after conducting health education through a zoom meeting, and the results of the post-test, most of the people knows and understands the COVID-19 preventive strategy for the elderly with comorbid diabetes mellitus. The result of p-value < 0.05, means that the public’s knowledge of the COVID-19 preventive strategy in the elderly with comorbid DM is better after health education based on telenursing through zoom meetings.

### 4. Discussion

Zoom can be categorized as an online learning media which can be interpreted as a system that allows the delivery of teaching materials to students using Internet media. Online learning media as an alternative to electronic-based learning provides many benefits, especially for the education process carried out remotely. In making online learning media, it is necessary to consider their expectations and goals in participating in online learning media, speed in accessing the internet or networks, bandwidth

limitations, costs for internet access, and background knowledge regarding readiness to take part in learning [10].

The use of the zoom application is an alternative to distance learning for lecturers and students at ARS University. The procedure for using this zoom application is simple and quite easy because it can be used via mobile phones or computers or PCs. Learning through zoom can be said to be effective in this era of the covid-19 pandemic[11].

The results showed that the level of knowledge of respondents regarding preventive strategies for COVID-19 in the elderly with diabetes mellitus before being given health education was still a lot who did not understand and understand. Researchers argue that there are still many respondents who have scores below 50 due to the lack of exposure from health workers regarding COVID-19 prevention strategies in the elderly with DM. In addition, other factors that can lead to a lack of respondents' knowledge include low awareness of the importance of DM management in the elderly, implementation of compliance with health protocols, the low willingness of respondents to find out about DM management, and limited information.

This research is in line with the theory put forward by Notoatmodjo (2007), the factors that influence knowledge of internal factors are education, and external factors are the lack of information and lack of support from health workers. This research is also in line with research conducted by Edyati (2015) before the personal hygiene health counseling was conducted with video media, most of the respondents had a level of knowledge in the sufficient category, as many as 31 respondents (86.1%). Research conducted by Kholishah (2017) and Sa, et. al. (2019) also shows the same thing, that before being given health education treatment with video media most of the respondents were in the less category as many as 46 children (95.5%). According to Notoatmodjo (2012), knowledge is the result of knowing and this occurs after people have sensed a certain object. One of the efforts that can be used to increase one's knowledge is to conduct health education. Health education can increase knowledge, and change awareness, and behavior so that people or communities participate in improving health status. After being given health education through nursing webinars and video media, it was found that the level of knowledge of the respondents was mostly in the good category with an average value of 71.72. The results showed that the knowledge of the respondents had increased after being given health education through nursing webinars. Researchers argue that providing education through nursing webinars is very effective where apart from being given through lectures and questions and answers, it is also given through video media in providing appropriate and interesting health education in conveying information affecting the outcomes of health education. Video media displays moving

images, and writing, and there is a sound that explains the images displayed so that they can attract the attention of health education targets. Video media displays materials in a concise, clear, and easy-to-understand manner, this can facilitate understanding and strengthen the respondent's memory. By using video media, learning becomes more varied, interesting, and fun. The execution time of video playback also does not take a long time, all messages can be delivered and can be received by respondents. This is evidenced when the health education process takes place, the respondents are enthusiastic and pay attention to the video shown by the researcher. The theory put forward by [17], is that video media in the learning process can increase student motivation and learning outcomes because it can explain something complicated or complex through audio-visual stimuli which ultimately produces better results.

In line with this research, online learning media is used as a tool to increase the efficiency and effectiveness of learning. Learning media is used to achieve goals such as making clear messages visually so that they are not too verbal. Overcome the limitations of space, time, and the five senses. Accelerate the learning and teaching process, create enthusiasm in learning, provide opportunities for participants to interact directly with their environment and the reality on the ground, and provide opportunities for participants to learn independently based on their abilities and interests [18], [19].

Health education can change the respondent's poor knowledge to be good. The use of media aids in providing health education is one of the important components to help the use of the senses as much as possible. Video media is a modern media, by the times. With video media, the message conveyed becomes more interesting. Messages conveyed through images and sound are also more concise, making them easy to understand. In this study, it can be seen that health education is very influential in the formation of student knowledge in a better direction. The media used in health education can also form real experiences on learning objectives. The researcher argues that as the respondent's knowledge increases, the behavior of respondents in managing diabetes mellitus and implementing health protocols during the COVID-19 pandemic will also increase.

## 5. Conclusion

The level of knowledge after being given health education through nursing webinars with lectures, question and answer methods, and video media, most of the respondents were in a good category. Researchers suggest that there is a virtual practice of health protocols that are carried out when giving materials, for example, the correct use of

masks, correct cough etiquette, and proper handwashing so that people can better understand and can apply them more effectively in everyday life. The distribution of booklets is attempted to facilitate the implementation of other COVID-19 prevention strategies related to the management of diabetes mellitus, a balanced diet, regular activities, and a healthy lifestyle.

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