



# The Influence of Online Cognitive Behavior Therapy Applications on Nurse's Anxiety during the COVID-19

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## Abstract

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**BACKGROUND:** Coronavirus disease 2019 (COVID-19) has an impact on all aspects of human life. The rapid spread of COVID-19 has resulted in many infected patients and deaths. The rapid increase in cases affects the physical and psychological health of health workers who work in hospitals. Health workers, especially nurses, are at the forefront of treating COVID-19 patients. The most common psychological impact is anxiety.

**AIM:** This study aims to determine the effect of the cognitive behavior therapy online application on nurses during the COVID-19 pandemic at the USU Teaching Hospital.

**METHODS:** The research design is a quasi-experimental study. The research procedure was carried out by developing an online CBT application for nurses. The research respondents were 60 nurses in the COVID-19 inpatient room which were divided into an intervention group and a control group. The implementation of CBT will be carried out in five sessions. The research process in the intervention group begins with conducting a pre-test, then intervention, and post-test. Meanwhile, in the control group, only pre- and post-tests were performed. Data analysis was performed using bivariate analysis, namely, t test.

**RESULTS:** The results of the study can be concluded that the majority of nurses are Muslim (46%), educated nurses (66.7%), female (75%) and working 0–6 months (31.7%), aged 34, 32 years with age a minimum of 26 years, and a maximum age of 45 years, and the average anxiety experienced by nurses was 61 and 73 (medium category). The results showed that there was a significant effect of giving CBT with nurses' anxiety ( $p = 0.001$ ). The difference in anxiety scores before and after the CBT intervention in the intervention group was greater than that in the control group.

**CONCLUSION:** Recommendations to hospitals apply CBT to reduce nurse anxiety.

## Introduction

Coronavirus disease 2019 (COVID-19) has an impact on all aspects of human life. The rapid spread of COVID-19 has resulted in many infected patients and deaths. More than 50,000 people were infected and more than 2000 deaths occurred in Wuhan [1]. COVID-19 in Indonesia was confirmed for the 1<sup>st</sup> time, there were two cases in March 2020 and there has been an increase in cases to date. At the end of 2020, there were 29,521 cases of COVID-19 infection and 1770 deaths [2]. The rapid increase in cases affects the physical and psychological health of health workers who work in hospitals, especially nurses are at the forefront of treating COVID-19 patients.

Nurses work 24 h to accompany COVID-19 patients in providing quality nursing care so that they can help patients and their families. The increasing number of cases and the heavier workload causes stress, anxiety, and difficulty sleeping in nurses [3]. The results of research conducted at King Saud and Jazan Universities in Saudi Arabia found that the majority of health workers experienced anxiety [4]. Shen *et al.* (2020) [3] research in Wuhan also reported that 33.4% of nurses experienced

anxiety, stress, and difficulties during the COVID-19 pandemic. The study of Sasha *et al.* (2021) [5] in China also stated that 34% experienced mild anxiety, 3.53% moderate anxiety, and 0.44% severe anxiety. The results of other studies showed that 50.55% of nurses responded positively to stress while 49.45% of nurses responded negatively to stress experienced during the COVID-19 pandemic. The results of research by Setiawati *et al.* (2021) [2] at RSU Dr. Soetomo Surabaya also obtained data that 33% of nurses had severe anxiety during the COVID-19 pandemic.

It states that anxiety is an individual's behavioral response to events in life. Anxiety is a feeling of uncertainty and unpleasantness due to the individual's perception of internal and external stimulation that threatens the safety, body, and psychology of humans. Anxiety experienced can occur in several levels ranging from mild, moderate, severe, and panic [6]. Anxiety can have a negative impact on individuals so that it requires a nursing intervention that can reduce the level of anxiety experienced by individuals. One therapy that can be done is cognitive behavior therapy (CBT). CBT is an intervention that can reduce patient anxiety by changing negative thoughts that can help patients change their response to situations [7].

CBT can be done using a smartphone app or online. One of the smartphone applications in the health sector that has been widely used is Mobile PhonesHealth Apps (mHealth apps). mHealth apps are very popular nowadays, especially for treating chronic disease patients. This application is very useful especially during the COVID-19 pandemic. This application reduces the risk of spreading COVID-19, patients do not need to go to the hospital to meet directly with nurses. Health apps (mHealth apps) in mental health services are very useful in providing interventions, reducing stigma and increasing patient safety and confidentiality.

The USU Teaching Hospital is one of the referral hospitals for COVID-19 patients. The USU Teaching Hospital has professional health workers who provide quality services to patients and families. In May 2020, one of the doctors at the USU Teaching Hospital was confirmed positive and died of a COVID-19 case [8]. The high number of patients being treated can cause psychological problems such as fear, stress, and anxiety, difficulty sleeping experienced by nurses who treat patients directly. This will certainly have an impact on the quality of health services provided. This phenomenon is the background for researchers to conduct research related to the effect of online cognitive behavior therapy applications on nurse anxiety during the COVID-19 pandemic period at USU Teaching Hospital.

**Methods**

The research design used in this study was “Quasi-experimental pre- and post-test with control group” with an online CBT application intervention. Quasi-experimental is to conduct research by providing intervention to one group of respondents and comparing with the control group that is not treated, and measuring the dependent variable before and after the intervention [9].

The sampling method was carried out by random sampling and is all subjects who met the criteria were included in the study until the required number of subjects was met [10]. The number of samples in this study was 30 respondents for each group so that the total number of samples was 60 respondents. The intervention room is the COVID inpatient room, while the control room is the intensive care unit, thus intervention and control in different rooms.

Data collection begins by first carrying out administrative procedures, namely, obtaining research permits. The researcher conducted ethical clearance at the Ethics Committee of the University of North Sumatra. Researchers prepared an online CBT application with the IT team. Researchers tested the validity and reliability of the research validity test are 0.80 and the reliability test is 0.82. After being reliable and valid, the researcher applied for a permit to the USU Education Hospital.

Univariate analysis was conducted to analyze the characteristics of the respondents. Categorical data were analyzed with frequency distribution tables and proportions. Numerical data were analyzed with mean and standard deviation, minimum, and maximum values. Bivariate analysis was performed using the t-test.

**Results**

The results of the study in Table 1. show that almost half of the nurses are Muslim (46%), the majority are educated nurses (66.7%), are female (75%), and work 0–6 months (31.7%).

**Table 1: Characteristics of COVID-19 Nurses at USU Teaching Hospital (n = 60)**

No.	Characteristics	Frequency	Percentage
1	Religion		
	Islam	46	76.7
	Protestant	13	21.7
	Catholic	1	1.7
2	Education		
	Diploma	9	15.0
	Nurse	40	66.7
	Master	11	18.3
3	Gender		
	Man	15	25.0
	Woman	45	75.0
4	Task Length		
	0–6 months	19	31.7
	7–12 months	15	25.0
	1–1.5 years	16	26.7
	1.5–2 years	9	15.0
	2–5 years	1	1.7

Table 2 shows that the average age of COVID-19 nurses at the USU Teaching Hospital is 34, 32 years with a minimum age of 26 years, and a maximum age of 45 years, and the average anxiety experience by nurses is 61.73 (moderate category).

**Table 2: Age of COVID-19 Nurses at USU Teaching Hospital (n = 60)**

Characteristics	Mean	SD	SE	Min-max
Age	34.32	4.164	0.538	26–45
Anxiety	61.73	11.44	1.47	27–77

Table 3 shows that the mean difference between nurses' anxiety in the intervention group and the control group before CBT was 4 with an average anxiety score of 63.73 in the intervention group, SD 6.74, while the control group had an average anxiety score of 59.73 with an SD of 14.58. It can be concluded that there is no difference in anxiety scores in the intervention and control groups before CBT (p = 0.180). The results also showed that the mean difference between nurses' anxiety in the intervention group and the control group after CBT was 2 with the average anxiety score for the intervention group 30.00 SD 6.63, while the control group had an average anxiety score of 27.57 with an SD of 6.89. It can be concluded that there is no difference in anxiety scores in the intervention and control groups after CBT (p = 0.169).

**Table 3: Differences in nurse anxiety scores in the intervention and control groups (n = 60)**

No	Group	N	mean	SD	SE	t	df	p-value	MD 95% CI
1	Before CBT								
	Intervention	30	63.73	6.746	1.232	1.363	40,868	0.180	4.000
	Control	30	59.73	14.584	2.663				
2	After CBT								
	Intervention	30	30.00	6.638	1.212	1.393	58	0.169	2.433
	Control	30	27.57	6.892	1.258				

Table 4 shows that there is a significant difference in the mean anxiety score in the intervention group ( $p = 0.001$ ) with a difference in pre- and post-CBT anxiety scores of 33.73. At present, in the control group, the difference between pre- and post-CBT anxiety scores was only 32.16 and it was concluded that there was a significant difference in the mean anxiety score in the control group ( $p = 0.001$ ). The result independent t test that there was no significant difference in nurses' anxiety before and after online CBT was performed in the intervention group and the control group. For the pair t test, there was a significant difference in nurses' anxiety in the intervention group and the control group before and after the CBT intervention, but the mean difference in the intervention group was higher than the control group before and after the CBT intervention.

**Table 4: Differences in nurse anxiety scores in the intervention and control group before and after CBT (n = 60)**

No	Group	mean	N	SD	SE	MD	p-value	Min-max
1	Intervention							
	Before	63.73	30	6.746	1.232	33.733	0.001	30–37
	After	30.00	30	6.638	1.212			
2	Control							
	Before	59.73	30	14.584	2.663	32.167	0.001	27–36
	After	27.57	30	6.892	1.258			

## Discussion

The results showed that the anxiety experienced by COVID-19 nurses at the USU Education Hospital was in the moderate category (mean anxiety score 61.73). The results of research conducted at King Saud and Jazan Universities in Saudi Arabia found that the majority of health workers experienced anxiety [4]. Shen *et al.* (2020) [3] research in Wuhan also reported that 33.4% of nurses experienced anxiety, stress, and difficulties during the COVID-19 pandemic. The study of Sasha *et al.* (2021) [5] in China also stated that 34% experienced mild anxiety, 3.53% moderate anxiety, and 0.44% severe anxiety. The results of other studies showed that 50.55% of nurses responded positively to stress while 49.45% of nurses responded negatively to stress experienced during the COVID-19 pandemic. The results of research by Setiawati *et al.* (2021) [2] at RSU Dr. Soetomo Surabaya also obtained data that 33% of nurses had severe anxiety during the COVID-19 pandemic.

Anxiety is an unclear fear accompanied by feelings of uncertainty, helplessness, isolation, and discomfort [11]. Anxiety (anxiety) is a feeling of fear that

is not clear and is not supported by the situation. No object can be identified as an anxiety stimulus [12].

Risk factors for anxiety are gender and age. The study [13] states that female nurses are at risk for experiencing anxiety. This is also in accordance with policy research (2021) [14] which states that female nurses tend to experience anxiety. Hassannia's [13] research (2021) states that the age of 30–39 years is the age at risk for experiencing anxiety. Zakeri (2021) [15] also stated that 18–30 years old tend to experience anxiety. In this study, the majority of nurses working to treat COVID-19 clients were female (75%). The average age of COVID-19 nurses at the USU Teaching Hospital is 34, 32 years with a minimum age of 26 years, and a maximum age of 45 years. According to the research by Puspanegara (2019) [16], which states that there is a relationship between late adulthood and coping mechanisms with anxiety, Most of the ages 21–45 years experience anxiety disorders. Health workers feel pressured and worried so that anxiety increases in carrying out their duties during the current COVID-19 pandemic.

The results showed that there was a significant effect on the anxiety scores of COVID-19 nurses at the USU Teaching Hospital before and after CBT was performed with p-value of 0.001. The results show that CBT is useful in reducing the anxiety experienced by nurses. CBT is an intervention that can reduce patient anxiety by changing negative thoughts that can help patients change their response to situations [7]. Therapeutic sessions conducted during CBT help patients improve effective coping and provide education and strategies to change dysfunctional behavior. CBT is done by teaching patients how to change negative thoughts so that they can change the anxiety-provoking situation and the ability to reduce anxiety.

Cognitive distortions that occurred during the COVID-19 period were overgeneralization or overestimation of one's own abilities such as the patient's words if I was exposed to COVID-19, it would be fatal, jumping to conclusions like the world would not change back to how it used to be and all or nothing with words like my inability to control this situation and ineffective coping skills [17]. The anxiety experienced can be overcome by doing CBT, distraction, deep breathing relaxation, improving the quality of social interaction, doing physical exercise, and increasing the patient's resilience to stress so as to produce a response that can combat the stress response [18].

CBT can be done in this research is using an online android smartphone application. This application reduces the risk of spreading COVID-19. Fennell (2020) [18] investigated the effect of CBT application on anxiety patients. The results showed a significant difference between the intervention group and the control group after being given an online CBT intervention. Another study conducted by Mariscal-Arcas (2021) [19] regarding the use of CBT techniques in muarasari communities with

anxiety facing the COVID-19 pandemic, respondents stated that the problem of anxiety disorders by applying CBT was largely resolved and very helpful. The online CBT application is very effective in reducing the anxiety experienced, the online CBT intervention in this study can be done anywhere and anytime.

## Conclusions and Suggestions

The results showed that there was a significant effect of giving CBT with nurses' anxiety ( $p = 0.001$ ). The difference in anxiety scores before and after the CBT intervention in the intervention group was greater than that in the control group. Recommendations for hospitals so that CBT can be applied to reduce nurse anxiety.

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