# **Original Article**

# The Effect of Telehealth Application on Anxiety Level and Quality of Life of Patients Diagnosed with COVID-19: A Quasi-Experimental Study

# Arzu Bahar, PhD, RN

Associate Professor, Yuksek Intisas University, Faculty of Health Sciences, Fundamentals of Nursing, Ankara, Turkey

# Nefise Cevriye Sucu Cakmak, MSN

Lecturer, The Eldivan Health Sciences Vocational School, Medical Services and Technic Department, Cankiri, Turkey

# Arzu Denler Kilic, PhD

Cankiri Ilgaz Goverment Hospital, President Doctor, Cankiri, Turkey

**Correspondence:** Arzu Bahar, PhD, RN, Associate Professor, Yuksek Ihtisas University, Faculty of Health Sciences, Fundamentals of Nursing, Ankara, Turkey E-mail: arzbahar@gmail.com

#### **Abstract**

**Objective:** The study was carried out to examine the effect of tele-health application on the anxiety level and quality of life of patients diagnosed with COVID-19.

**Method:** The sample was divided into the application (N=28) and control groups (N=28) by random sampling method. The application group was given COVID-19 discharge training prepared by the researchers and followed up with telemonitoring over the phone. In the study, data were collected with a pretest- posttest design, and patient identification form, Quality of Life SF-36 scale and Beck Anxiety scale were used as data collection forms.

**Results:** After COVID-19 training and tele health were applied to the patients in the experimental group, it was determined that there was a difference between the two groups in terms of some sub-dimensions of quality of life in both groups (p<0.05). When the posttest measurements of the anxiety scale after the application were examined, it was determined that there was a decrease in the anxiety score in the experimental group (p<0.05).

**Conclusions:** It has been found that COVID-19 patient education and telehealthmethod both have a positive effect on the quality of life of the patients and reduce their anxiety. The tele health method can encourage to in the patient education and psychological support of the patient, in situations where access to health is limited due to natural disasters.

Keywords: COVID- 19, tele health, quarantine, quality of life, anxiety

## Introduction

With the COVID pandemic that started in Wuhan, China at the end of 2019, a unique period has been entered all over the world(Hakım et all 2020; Dedelia et all 2020). The COVID 19 pandemic, which continues today with different variants, has caused radical changes in social, cultural, education and health systems around the world(Zhang ve Liu 2020; Wang et al 2020; Alipour &Abdolahzadeh 2020). In this period, health professionals tried use telehealth to applications as a good alternative in solving the problems of patients' access to health services in quarantine practices to reduce the rate of transmission of the disease Orso et all 2020; Purabdollah & Ghasempour 2020; Orso et all 2020; Alessi et all 2021; Monagnesh & Hajizadeh 2020; Smith et all 2020; Byrne 2020). Thus, the use of telehealth applications, which first started in the 1950s, gained rapid momentum especially during the pandemic period (Byrne 2020; Lurie &Carr 2018; Clipper 2020; Fagherazzi 2020). Telehealth applications, which became widespread during the COVID 19 pandemic period, are generally a system that provides

two-way communication between healthcare professionals and patients, and includes image, speech and digital communication Technologies (Hazin & Qaddoumi, 2010; Merz et all 2021; Bryne 2020). Ithough the terms telemedicine and telehealth sometimes used interchangeably in the literature, while providing medical care and treatment to telemedicine applications, patients, all health professionals offer service options such as disease prevention, diagnosis, treatment, and disease management training in telehealth(Bryne 2020; Mahoney 2020; Ajalli & Khoshknab 2015; Pazar et all 2015; Catan et all 2010).

Patient education and tele-monitoring, which are frequently included in the scope of telehealth, include the use of media communication tools such Skype, FaceTime, WhatsApp Short Message Service via smart mobile phones that provide twoway communication in the delivery of health care services (Hakım et all 2020; Jahromi et all 2016; beney et all 2002; Chakeri et all 2020; Schaumberg 2020). Tele-monitoring is popular due to its low cost and easy use, as well as supporting patient education with written visual materials, providing repeated patient education, symptom management and recognition early complications of (Fairbrother et all 2014; Inglis et all 2017; Ivonov 2016). Studies have reported that telemonitoring is effective in providing drug compliance, self-care power, cognitive social adaptation and high patient satisfaction, and coping with illness-induced anxiety(Hawkes et al 2013; Hindistan & Cilingir 2012; Farazmand et all 2017; Ionov et all 2016; Merz et all 2020; Ramaswamy et all 2020; Jahromi et all 2016). In the relevant literature, there are research results reporting that tele-monitoring improves the quality of life of patients and reduces repeated hospitalizations(Farazmand et all 2017, Manzato et all 2021; Raessi et all 2021; Hawkes et all 2013; Fairbrother et all 2014). Tele-health is a good option to support the management of physical and mental symptoms of quarantined patients isolated at home during the COVID 19 pandemic. In studies investigating the mental problems of COVID 19 patients in home quarantine due to the decrease in their access to health services and social support, it was stated that the

patients experienced problems such as depression, stress, sleep problems, and anxiety (Verma 2020, Alipour et all 2020; Chakeri et all 2020; Zhou et all 2020). For this reason, when the patients in quarantine are evaluated holistically, there is a need for studies that evaluate the effect of telehealth practice on both the quality of life and anxiety of patients.

Although there are studies in the related literature showing that tele-monitoring improves coping with physical problems and improves quality of life, and reduces mental problems such as anxiety and depression, studies showing the effect of tele-monitoring given to quarantined patients on anxiety and quality of life are quite limited (Kamei et all 2021; Jahromi et all 2016), Charekei et all 2020; Allipour et all 2020). The fact that the COVID 19 pandemic continues to exist in global health with different variants shows that quarantine practices will continue for a while. For this reason, it is critical to develop tele-health services by evaluating the impact and quality of tele-health services to be given to quarantined patients. The study was conducted to evaluate the effect of telehealth service to be given to patients under home quarantine during the COVID 19 pandemic on anxiety and quality of life.

#### Methods

**Study design:** The research was conducted as a quasi-experimental, case-control, pre-test post-test design follow up study in order to examine the effect of tele-health application given to patients in COVID 19 quarantine on anxiety and quality of life of patients. The population of the study consisted of patients who were quarantined at home for 10 days after applying to the COVID 19 outpatient clinic of a state hospital. The data in the study were collected between 01.01.2021 and 05.06.2021. G power analysis was used to calculate the sample size of the study. As a result of the power analysis, when at least 57 people (at least 28 people for each group) were included in the study, it was calculated that 80% power could be obtained at the 95% confidence level. The patients participating in the study were included in an experimental and a control group, respectively. The 28 patients who met the inclusion criteria were assigned to the control group and the 29 patients were assigned to the control group.

Volunteer patients with a diagnosis of COVID 19, quarantined at home, over 18 years of age, without communication problems, literate, no diagnosed mental pathology, and able to use smart mobile phones were included in the study. In the study, a patient whose general condition deteriorated during the COVID 19 quarantine and who was hospitalized was excluded from the sample.

Data collection tools: Data were collected by online surveys via Google Forms since the patients were under quarantine in the study. A total of four forms, including patient introduction form, SF-Quality-of-Life Scale and Beck Anxiety Scale, COVID 19 Education Booklet, and Tele-monitoring Checklist, were used to collect data in the study. The patient introduction form created by the researchers consists of 18 questions to reflect the essential characteristics of patients. Along with age, educational status, gender, past illness history, and current illness history, there are questions about whether patients have received information about the disease, COVID 19 education, and satisfaction with the phone monitoring service provided in the questionnaire form. In collecting data, the patients' quality of life was evaluated with the Short Form of the Quality-of-Life Scale (SF 36). Rand Corporation developed this scale to evaluate the quality of life. The scale consists of 8 sub-scales, including physical function, social function, physical role function, emotional role function, mental health, wellness, pain, general health, at a total of 36 items. Evaluation on the scale is carried out by Likert type, except for some items, and the last 4 weeks are taken into account. Subscales evaluate health between 0-100 and show that the higher the score, the better the quality of life.(Atalıkoglu et all, 2021; Kocyigit et all,1999). In the study, the Beck anxiety scale was used to evaluate the anxiety experienced by the patients during the quarantine process. Beck developed the Beck Anxiety Scale in 1988. It is a Likert-type evaluation tool that gives scores ranging from 0-3 on a scale consisting of 21 items. When calculating the total score, the responses to the items in the scale are collected. 8–15 points obtained from the scale indicate = Mild anxiety, 16-25 points = Moderate anxiety, 26-63 points = Severe anxiety. The lowest score obtained from the scale is 0, while the highest score is 63. A high

total score indicates an increase in the severity of anxiety (Akin & Cetin, 2007; Kurt et al., 2021). In the study, the researchers prepared a COVID 19 disease management training booklet as educational material in telehealth applications in the experimental group. In the training booklet, which was developed based on the literature and in line with expert opinions, there are sections containing the COVID 19 agent, symptoms, mode of transmission, diagnosis, treatment methods, drug management, applications for possible complications after treatment, what to do in emergencies, and reference resources. (https://www.cdc.gov/coronavirus/2019-

ncov/hcp/guidance-home-care.html; Interim Guidance for Implementing Home Care of People Not Requiring Hospitalization for Coronavirus Disease 2019 (COVID 19); Signal 2020; Zhu et all 2020; Adhiraki et all 2020;

https://covid19bilgi.saglik.gov.tr/depo/rehber ler/COVID 19-rehberi).

In the study, the researchers prepared a Telemonitoring Checklist to record the training and telemonitoring provided within the scope of telehealth conducted with each patient in the experimental group. This list was filled based on patients' responses on calls on days 1, 5, and 9 of patients' quarantine. The checklist content included a record of the answers to whether there was an increase or decrease in the symptoms of patients, whether they experienced a different symptom, how they felt spiritually and physically at each telemonitoring.

**Intervention:** Patients who were quarantined at home due to COVID 19 diagnosis and met the study's inclusion criteria were informed about the research by the doctor in charge of the pandemic outpatient clinic. The telephone numbers of the patients who volunteered to participate in the study were forwarded to the researcher. The researcher performed telemonitoring in 3 sessions for patients in the experimental group. The application on the first day of their quarantine with the patients in the experimental group who agreed to participate in the research. Then, the patients who completed the online questionnaire forms were called by the researcher by phone. During the first interview, the researcher provided information about the COVID 19 patient education booklet covered topics.

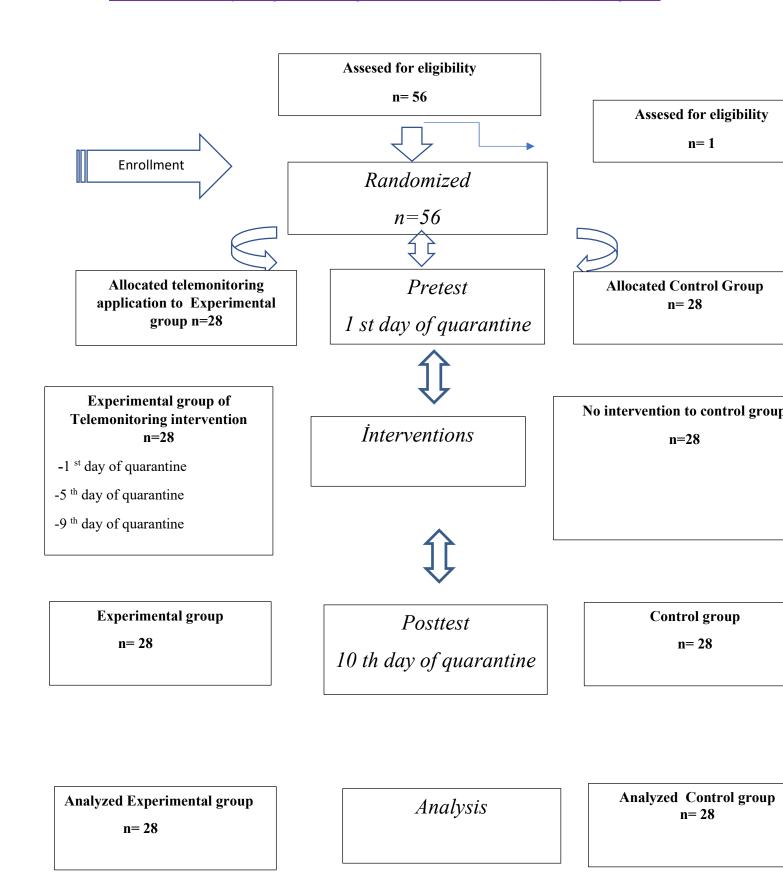


Figure: Study process

At the end of the interview, feedback was received on the issues discussed by question and answer, an online training booklet was shared, and COVID 19 disease management training was provided. After completing the training, patients were asked questions about the items on the telemonitoring checklist, and their answers were recorded. The training of each patient in the

experimental group on the first day of quarantine was completed about 25-30 minutes. The patients in quarantine were telemonitored two more times, on the fifth and ninth days of the quarantine, by the researchers. During this process, questions in the tele-monitoring checklist were asked, and other questions patients wanted to consult were answered. The responses of the patients were recorded. On the last day of the quarantine, the patients participated in the last test online, and the data collection was terminated.

The pre-test questionnaire forms were sent to the patients' phones using WhatsApp messaging program before patient education was conducted within the scope of telehealth The patients in the control group were called by the researcher by phone on the first day of quarantine to fill out the online pre-test forms. Online final test forms were applied on the last day of quarantine. There was no telephone monitoring in the control group, and the patients received only routine care in the home.

Statistical analysis: Statistical Packages for the Social Sciences (SPSS) 24.0 program was used to analyze the data. Descriptive statistics such as number and percentage were used in the evaluation of sociodemographic and descriptive characteristics. In the analysis of the tests, the level of significance (p value) was taken as <0.05. The conformity of the data to the normal distribution was examined with the Kolmogorov Smirnov Parametric tests were used in the analysis of normally distributed data, parametric tests were used in the analysis of non-normally distributed data (Chi-square, Independent groups t-test, Man Whitney U

**Ethical considerations:** Written permission was obtained from Cankiri University Ethics Committee (dated 7.10.2020 and ethical

committee number: 328), Scientific Research Platform of the Ministry of Health of the Republic of Turkey (2020-11-13T21\_36\_41), and Cankiri State Hospital in order to conduct the research. After obtaining all necessary permissions for the study, the patient who met the criteria were informed and their written consent was taken before the data collection. They were assured about confidentially; as well they informed that they can withdraw any time from the study. The research was conducted following the Helsinki Declaration on Human Rights.

#### Results

The research was conducted with 56 patients with Covid-19 diagnosis. Table 1 shows the distribution of socio-demographic characteristics of patients in all groups. The experimental group participants' mean age was  $37.35\pm11.70$ ; on the other hand, the control group's mean age was 40.21±10.25. 53.62% of the patients in the experimental group were female, and 46.7% of the patients in the control group were male. While the experimental group of 78.5% was married, the control group of 21% was married, too. The data reveals that 82.12% of the patients in the experimental group applied to an outpatient clinic, and 14.3% of the patients in the control group were admitted to an emergency department or came by an ambulance when examining the admission status of the patients to the hospital. The findings suggested that 96.4% of the patients in the experimental group reported their satisfaction with the telemonitoring education (Table 1).

According to the Chi-square test results, there was no statistical difference between the groups in terms of the age group, gender group, marital status, profession, education status, presence of chronic disease, smoking status, how to apply to hospital in both groups were found to have a homogeneous distribution (P=.417; p=.076; p=.089; p=.045; p=.086; p=.091). (Table 1) Initially, we compared the two groups' pre-test scores for the life quality scale categorized all No subscales. statistically significant difference existed among the groups(p>0.005). ( Table 2)

**Table 1. Demographic characteristics of patients** 

Demographic characteristics	Experimental group(N=28)		Control group(N=28)				
	X	SD-MİN MAX	X	SD- MİN MAX	$X^2/p$		
Age	37.35±11.70	10.45±59	40.21±10.25	12.3	$X^2 = 0.238$		
	N	%	N	%	p=.417		
Gender	1 <b>V</b>	70	IV	70			
Female	15	53.6	15	53.6	$X^2=1.708$		
Male	13	46.7	13	46.7	p=.076		
Marital status	13	40.7	13	40.7	P		
Married Married	22	78.6	21	75	X <sup>2</sup> =1.88		
					p=.089		
Single	6	10.7	7	25	۲ .007		
Educational status							
Middle school graduation	22	78.6	14	50	$X^2=4.26$		
Associate degree	3	10.7	6	21.4	p=.871		
Undergraduate graduate	3	10.7	8	38.6			
Profession							
Officer	3	10.7	6	21.4	X <sup>2</sup> =0.316		
Laberer	8	28.6	7	7	p=.045		
Unemployed	13	46.7	12	42.9			
Self-employment	2	7.1	1	3.6			
Retired	2	7.1	2	7.1			
Ways of application to the hosp	oital						
Policlinic	23	82.1	21	75	$X^2=2.62$		
Emergency servis	5	17.9	7 1	14.3	p=.971		
Smoking							
Yes	10	35.7	2	7.1	X <sup>2</sup> =2.18		
No	18	64.3	26	92.9	p=.692		
Presence of chronic disease			1	1			
Yes	5	17	9	32.1	X <sup>2</sup> =3.12		
No	23	83	19	67.9	p=.086		
Tele monitoring satisfaction		[		1			
Yes	27	96.4			$X^2=1.73$		
No	1	3.6			p=.091		

Table 2. The group's pretest and post test Scores of Life Quality scale(SF-36)

Scores of Scorest of Life Quality scale	Pretest Scores		Post test Scores		
Quality service	X	P	X	P	
Physical function			-		
Experimental group	85.89± 24.34	0.072	$90.53 \pm 10.30$	0.001**	
Control group	74.44 ±22.24		$74.28 \pm 13.08$		
T. 1.837				T 3.042	
Physical role challenge	<u>.</u>	•		<u>.</u>	
Experimental group	64.28 ±23.26	0.485	24.28 ±12.34	0.036*	
Control group	$56.25 \pm 42.28$	T-0.703	45.53±11.45	Z-2.149	
Emotional role difficulty					
Experimental group	66.66± 20.57	0.528	32.14±10.74	0.160	
Control group	75.00±26.38		45.23± 17.64	-1.426	
T—0.635					
Energy/vitality				<u>'</u>	
Experimental group	$66.96 \pm 40.57$	0.158	$75.71 \pm 18.89$	0.084	
Control group	57.85 ±26.54	T-1.431	65.17-22.43	T-1.75	
Mental health					
Experimental group	29.14± 12.21	0.767 P	34.82 ±11.47		
Control group	27.86 ±11.54	Z: -, 296	22.18 ±9.78	0.004*	
Social Function					
Experimental group	67.85 ±29.15	0.553	$63.83 \pm 22.13$	0.031*	
Control group	$62.05 \pm 21.45$	T-0.808	50.49± 21.49	T-2.22	
Pain					
Experimental group	69.73± 23.22	0.583	44.89± 16.90	0.198	
Control group	66.42± 21.45	T-0.553	52.14-14.10	T1.303	
General health					
Experimental group	61.60 ±20.55	0.728	$33.68 \pm 14.25$		
Control group	61.96 ±17.06	Z: -1.146	23.32± 12.36	0.017*	
*-n<0.005.7-Man White				0.017	

<sup>\* =</sup>p<0.005 Z=Man Whitney U test significant value T =Independent T test significant value

	Experimental group N=28 X ± SD	Control group N=28 X ± SD	Min	Max	p	t
Prestest scores of	31.32-12.11	36.07-11.38	20	49	0.178	-1.366
Beck anxiety scores						
Prestest scores of	23.89-8.42	34.92-14.29	20	54	0.001*	-3.521
Beck anxiety scores						

Table 3. The group's pretest and post test of Beck anxiety scores

As for the scores in the post-test that followed by the interventions, the experimental group's scores in the physical function subscale (90.53±10.30), the mental health subscale  $(34.82 \pm 11.47 \text{ am})$ , social functioning subscale (63.83±22.13), and general health subscale (33.68±14.25) were higher than those of the control group (74.28±13.08,  $22.18\pm9.78$ ,  $50.49\pm21.49$ 23.32±12.36 respectively). In other words, there was a statistically significant difference between the groups in their scores in these four aspects (p=0.001, p=0.004, p=0.031, p=0.017, respectively). (Table 2).

Although the experimental group got lower post-test scores of physical role limitations subscale (24.28±12.34) than the control group (45.53±11.45), the Mann-Whitney U test concluded that the difference was statistically significant (p=.060, Z=1.893) (Table 2) in terms of between the groups in physical role limitations subscales scores (p=.036, Z=-2.149) (Table 2).

Beck anxiety scale pretest-posttest scores were evaluated for the anxiety level of the patients. There was no statistically significant difference (P=0.178, t=-1.366) between the mean Beck anxiety scale pre-test scores  $(31.32\pm12.11)$  and the control group (36.07-11.38) (Table 3). A significant difference (t=-3.521, p=0.001) was found between the mean score of the experimental group (23.89±8.42) and the control group (34.92±14.29 in the beck anxiety scale post-test scores after Covid 19 patient telemonitoring training. It was determined that both groups had a decrease in the mean score of Beck's anxiety scale after skill training, and the reduction in the experimental group was more significant than

in the other group. After the telehealth intervention in the experimental group, it was found that the patients in the experimental group had moderate anxiety, while the patients in the control group had severe anxiety.

## **Discussion**

Access to social support and health care is challenging due to social isolation, especially for people under quarantine during the pandemic. This situation caused individuals to experience both anxieties and decreased quality of life (Farazmant et all 2017; Hanssen et all 2002; Verma et all 2020; Chakeri et all 2020, Zhou et all 2020). The research was conducted to evaluate the effects of telehealth application on anxiety and the quality of life of people in quarantine.

The first important finding in the study is that independent variables such as age group, gender, educational status, which are socio-demographic data, did not make a statistically significant difference in both the pre-tests and post-tests of the individuals in the experimental and control groups.

After the researcher gave the telehealth application to the experimental group, it was determined that the quality-of-life scale scores between the two groups, such as physical function, mental health, and general health, increased in favor of the experimental group. A limited number of studies in the relevant literature evaluate the quality of life and satisfaction results of telemonitoring intervention given to people during the COVID 19 period (Raessi et all 2020; Merz et all 2021; Saldahanda et all 2020). Raessi et all have conducted research with 120 COVID-19

patients, and it was found that the quality-oflife scores was significantly higher in the telehealth intervention group than in the control group. (Raessi et al 2020). In another study conducted by telehealth application supported by electronic medical records of patients receiving breast cancer treatment during the pandemic period, it was found that the vast majority of participants were quite satisfied with telehealth application (Merz et al 2021). Similarly, a patient monitoring protocol was developed within the scope of the telehealth application to evaluate the physical psychological symptoms personal diabetes management of type 1 diabetes patients during the COVID 19 period. As a result of the research, it was determined that the telehealth application given to the patient group was influential in disease monitoring and helped to reduce faceto-face consultations (Saldahanda et al 2020).

Apart from the COVID 19 period, within the scope of telehealth applications, there are also studies that follow-up of patients with chronic diseases such as patients with acute myocardial infarction, those with pacemakers, cancer patients, patients with type 2 diabetes, patients with urinary diversion, hemodialysis patients and also determine the effects of post-discharge education and follow-up results on quality of life and patient satisfaction. (Farazmand et all 2017; Kimman et all 2010; Malmstrom et all 2016; Hanssen et all 2020; Szots et all 2016). Hansen et al. determined that the 6-month tele-monitoring program given to patients with acute myocardial infarction after discharge contributed to an increase in the physical health component subscale of the quality-of-life scale and a change in healthy life behavior after discharge in the intervention group compared to the control group. (Hanssen et 2020). In their study with 117 patients who had undergone total knee arthroplasty, Szots et all provided traditional care to the control group while providing training to the experimental group by telemonitoring on the 4th and 14th days after discharge in addition to traditional care. Patient training was provided by telemonitoring per day. While it was found that monitoring did not make a difference between the groups in terms of the scores obtained in the physical dimension of quality of life, there

was a positive difference in favor of the experimental group in different components of the quality of life scale. In addition, it was reported that the patients in the experimental group came to unplanned outpatient clinic controls less than the control group (Szost et all 2016). In parallel with the results of the research, it has been determined in the relevant literature that telehealth applications have positive effects on patients' quarantine process, chronic disease management, and quality of life, and applications to unplanned outpatient services have decreased (Farazmand et all 2017; Kimman et all 2010; Malmstrom et all 2016; Hanssen et all 2020; Szots et all 2016)

In addition to the positive effects of telemonitoring method on patients' quality of life and satisfaction, there are also research results in the relevant literature stating that there is no significant difference between traditional monitoring methods (Beney et all 2002; Wild et all 2016; Merz et all 2020). In one of these studies by Benet et al., the experimental group was given counseling training by phone 48-72 hours after discharge in the cancer patients sampled in their studies. At the same time, they did not intervene in the control group. As a result of the study, it was reported that there was no difference between the two groups in the physical well-being subscale scores of quality of life. In another study conducted with cancer patients, the results of a nurse-led telehealth application given to a group as part of traditional followup 1 year after treatment were compared. As a result of the research, it was found that there was no difference between the quality of life scores related to health quality between the two methods (Beney et all 2002)

Although there are research results in the literature reporting that telehealth application does not make a difference in the quality of life and patient satisfaction, researchers have agreed that telehealth applications are an excellent alternative to reduce COVID 19 transmission and outpatient visits (Beney et all 2002; Merz et all 2020; Monagesh and Hajizadeh; 2020).).

It has been found that compulsory social isolation during the COVID-19 period negatively affects the quality of life of patients, as well as mental health. Many

countries have stated that telehealth is appropriate in dealing with mental problems such as anxiety and depression (Caetano et all 2020; Zhou et all 2020). The COVID 19 pandemic affected a large mass in the world, and in this process, the isolation measures, the limitation of face-to-face social support and life, and the inability to predict when the epidemic would end caused patients to experience anxiety. (Charaki of meat 2020; 2020 Bajema et all). Looking at the relevant research results, there are different results in studies in which the effect of telemonitoring on anxiety outcomes was evaluated in the management of chronic diseases in COVID-19 and previous years (Manzato et all 2021; Mancini et all 2020; Mcdowell et all 2015; Ionov et all 2016). In their research conducted by Mc Dowell et al with 110 COPD patients, the intervention group was provided with telemonitoring for 6 months, while the other group was followed up with patient monitoring in a traditional outpatient clinic. As a result of the research, it was reported that telemonitoring positively affects the quality of life and anxiety level in the intervention group (Mc Dowell et al 2015). Ionov et al(2016) developed an online tele-monitoring platform to monitor blood pressure in unstable hypertension patients. While online telemonitoring was performed in the experimental group, face-to-face patient monitoring was performed in the control group. Based on the research results, it was found that the experimental group had a positive effect on both blood pressure, anxiety, and depression levels. Our research results have also revealed similar results to the relevant literature. It was found that there was no difference in terms of anxiety scores in the experimental and control groups before the telehealth intervention. After telemonitoring intervention, it was found that patients' anxiety scores the experimental group decreased significantly compared to the control group.

Conclusion and recommendations: The COVID-19 pandemic has been affecting the world for more than 2 years. Despite the vaccines developed, the SAR-CoV-2 virus, which is the causative agent of the disease, still negatively affects millions of people's physical and mental health with different variations, increasing anxiety levels and

reducing their quality of life. Based on our research results, it is seen that telehealth applications positively affect both the quality of life and anxiety levels of patients. Telehealth is a good solution because it is cost-effective, easy to implement, and most importantly, for the continuity of the management of the disease in diseases such as COVID 19, where healthcare personnel are at high risk of transmission. When our research results and the literature are examined together and considering these positive features of telehealth applications, it is necessary to use it primarily in the education and psychological support of the patient, especially in diseases with a risk of transmission, in chronic patient groups, in situations where access to health is limited due to natural disasters such as epidemics and earthquakes. In future research, there is a need for health institutions to develop their telehealth protocols, to compare the costs of traditional follow-up telehealth and support applications, telehealth to applications with different web-based programs, to study the effect of telehealth on anxiety and quality of life with a multidisciplinary team in randomized controlled large samples.

**Limitations:** One of the limitations of the study is that it was conducted in a single center and with a small sample, and the other is that the patients could not be selected in a randomized controlled manner.

## References

Ajalli, A., & Khoshknab FM.(2015). Tele nursing care in chronic patients/a systematic review. Iranian Journal of Rehabilitation Research,1(3),76-86.

Akin, A., & Cetin, B. (2007). The Depression Anxiety and Stress Scale (DASS): The study of Validity and Reliability. Educational Sciences: Theory & Practice, 7(1).

Alessi, J., de Oliveira, G. B., Franco, D. W., Becker, A. S., Knijnik, C. P., Kobe, G. L., Schaan BD & Telo, G. H. (2021). Telehealth strategy to mitigate the negative psychological impact of the COVID 19pandemic on type 2 diabetes: a randomized controlled trial. Acta diabetologica,58(7),899–909

Alipour A, Ghadami A, Alipour Z, Abdolahzadeh H. (2020). Preliminary validation of the corona disease anxiety scale (CDAS) in the Iranian sample. Quality J Health Psychol, 8,163-75.

https://doi.org/10.1007/s00592-021-01690-1

- Beney J, Devine B, Chow V, Ignoffo JR, Mitsunaga L, Shahkarami M, McMillan A, Bero L.(2020). A. Effect of Telephone Follow-up on the Physical Well-Being Dimension of Quality of Life in Patients with Cancer. Pharmacotherapy,22(10),1301-11. doi: 10.1592/phco.22.15.1301.33480
- Beney J, Devine EB, Chow V, et al.(2022). Effect of telephone follow-up on the physical well-being dimension of quality of life in patients with cancer. Pharmacotherapy,22(10),1301-1311. doi:10.1592/phco.22.15.1301.334
- Byrne, M. D. (2020).Telehealth and the COVID 19Pandemic. Journal of PeriAnesthesia Nursing,35(5), 548-551.DOI: 10.1177/15586898211019512-
- Catan, M. L., Bloebaum, M. M., Dirksen, C. D., Houben, R. M., Lambin, P., & Boersma, L. J.(2010). Patient satisfaction with nurse-led telephone follow-up after curative treatment for breast cancer. BMC cancer, 10(1),1-10
- Chakeri A, Jalali E, Ghadi MR, Mohamadi M.(2020). Evaluating the effect of nurse-led telephone follow-ups (tele-nursing) on the anxiety levels in people with coronavirus. J Family Med Prim Care,9(10),5351-5354. Published 2020 Oct 30. doi: 10.4103/jfmpc.jfmpc\_847\_20
- Clipper B. (2020). The Influence of the COVID-19 Pandemic on Technology: Adoption in Health Care. Nurse Lead,18(5),500-503. doi:10.1016/j.mnl.2020.06.008de Mattos Matheus AS, Cabizuca CA, Tannus LRM, et al. Telemonitoring type 1 diabetes patients during the COVID-19 pandemic in Brazil: was it useful?. Arch Endocrinol Metab. 2021;65(1):105-111. doi:10.20945/2359-3997000000309
- Fagherazzi G, Goetzinger C, Rashid MA, Aguayo GA, Huiart L.(2020). Digital Health Strategies to Fight COVID-19 Worldwide: Challenges, Recommendations, and a Call for Papers. J Med Internet Res.,22(6),e19284. Published 2020 Jun 16. doi:10.2196/19284
- Farazmand, J., Nasiripour, A. A., & Raeissi, P. (2017). The effect of telephone follow-up programs after hospital discharge on hope and the quality of life in patients admitted to the coronary care unit (CCU). Journal of Babol University of Medical Sciences, 19(2), 41-46.
- Hâkim AA, Kellish AS, Atabek U, Spitz FR, Hong YK. (2020). Implications for the use of telehealth in surgical patients during the COVID-19 pandemic. Am J Surg, 220(1), 48-49. doi: 10.1016/j.amjsurg.2020.04.026
- Hanssen TA, Nordrehaug JE, Eide GE, Hanestad BR. (2009). Does a telephone follow-up intervention for patients discharged with acute myocardial infarction have long-term effects on health-related quality of life? A randomised

- controlled trial. J Clin Nurs.18(9),1334-1345. doi:10.1111/j.1365-2702.2008.02654.x
- Hawkes AL, Patrao TA, Atherton J, et al. (2013). Effect of a telephone-delivered coronary heart disease secondary prevention program (proactive heart) on quality of life and health behaviours: primary outcomes of a randomised controlled trial. Int J Behav Med,20(3),413-424. doi:10.1007/s12529-012-9250-5
- Hindistan, S, Cilingir D. A Current Approach in Nursing Practice: Telephone Usage. Journal of Education and Research in Nursing.2012;9(1):30-35
- Ionov, M., Iudina, I., Avdonina, N., Emelvanov, I., Zvartau, N., Kurapeev, D., & Konradi, A. 03-07- Blood (2016).Mps Pressure Telemonitoring Effectiveness In Patients With Uncontrolled Hypertension: Impact Anxiety And Depression. Journal of Hypertension.34: 85-86.doi: 10.1097/01.hjh.0000491773.28756.1f
- Kargar Jahromi M, Javadpour S, Taheri L, Poorgholami F.(2015). Effect of Nurse-Led Telephone Follow ups (Tele-Nursing) on Depression, Anxiety and Stress in Hemodialysis Patients. Glob J Health Sci. 8(3),168-173. Published 2015 Jul 26. doi:10.5539/gjhs. v8n3p168
- Kimman ML, Dirksen CD, Voogd AC, et al. (2011). Nurse-led telephone follow-up and an educational group programme after breast cancer treatment: results of a 2 × 2 randomised controlled trial. Eur J Cancer,47(7),1027-1036. doi: 10.1016/j.ejca.2010.12.003
- Kocyigit, H, Aydemir, O, Olmez, N ve ark. (1999). Reliability and validity of SF-36 for Turkish, Drug and treatment, 12, 102-6
- Kurt, P., Sarioglu, M., & Parlak, S. (2021). The Effect of Online Psychodrama Group Therapy on Depression, Anxiety and Resilience during the Pandemic Process. EducatIon & Youth Research-EYOR, 1(2), 108-121.
- Lurie, N., & Carr, B. G. (2018). The Role of Telehealth in the Medical Response to Disasters. JAMA Intern Med,178(6),745-746. doi:10.1001/jamainternmed.2018.1314-
- Mahoney FM.(2020).Telehealth, Telemedicine, and Related Technologic Platforms Current Practice and Response to the COVID 19.Wound Ostomy Continence Nurs,47(5),439-444.- DOI: 10.1097/WON.000000000000000694
- Malmstrom M, Ivarsson B, Klefsgård R, Persson K, Jakobsson U, Johansson J. (2016). The effect of a nurse led telephone supportive care programme on patients' quality of life, received information and health care contacts after oesophageal cancer surgery-A six month RCT-follow-up study. Int J Nurs Stud,64,86-95. doi:10.1016/j.ijnurstu.2016.09.009

- Mancini, F., van Halteren, A. D., Carta, T., Thomas, S., Bloem, B. R., & Darweesh, S. K. (2020). Personalized care management for persons with Parkinson's disease: A telenursing solution. Clinical parkinsonism & related disorders.3,1-4 https://doi.org/10.1016/j.prdoa.2020.100070
- McDowell JE, McClean S, FitzGibbon F, Tate S. (2015). A randomised clinical trial of the effectiveness of home-based health care with telemonitoring in patients with COPD. J Telemed Telecare.21(2),80-87. doi:10.1177/1357633X14566575
- Merz V, Ferro A, Piras EM, Zanutto A, Caffo O,
  Messina C. (2021). Electronic Medical
  Record-Assisted Telephone Follow-Up of
  Breast Cancer Survivors During the COVID19 Pandemic: A Single Institution Experience.
  JCO Oncol Pract.17(1),e44-e52.
  doi:10.1200/OP.20.00643
- Monaghesh, E., & Hajizadeh, A. (2020). The role of telehealth during COVID 19outbreak: a systematic review based on current evidence. BMC Public Health.20(1),1193-https://doi.org/10.1186/s12889-020-09301-4
- Orso F, Migliorini M, Herbst A, et al. (2020). Protocol for Telehealth Evaluation and Follow-up of Patients With Chronic Heart Failure During the COVID-19 Pandemic. J Am Med Dir Assoc.21(12),1803-1807. doi: 10.1016/j.jamda.2020.10.017
- Pazar B, Tastan S, İyigun E. The Role of the Nurse in the Tele-Health System. Medical Journal of Bakırkoy,2015;11(1):1-4
- Purabdollah M, Ghasempour M.(2020). Tele-Nursing New Opportunity for Nursing Care in COVID-19 Pandemic Crisis. Iran J Public Health,49(Suppl1),130-131. doi:10.18502/ijph.v49iS1.3685
- Raesi R, Shaye ZA, Saghari S, Sheikh Beig Goharrizi MA, Raei M, Hushmandi K. (2021). The impact of education through nurse-led telephone follow-up (telenursing) on the quality of life of COVID-19 patients. J Egypt Public Health Assoc.96(1),30. Published 2021 Nov 8. doi:10.1186/s42506-021-00093-y
- Ramaswamy A, Yu M, Drangsholt S, et al. (2020).

  Patient Satisfaction With Telemedicine During the COVID-19 Pandemic: Retrospective Cohort Study. J Med Internet Res.22(9):e20786. Published 2020 Sep 9. doi:10.2196/20786

- Schaumberg L.(2020). Advanced Practice Telenursing Through a Pandemic- J Psychosoc Nurs Ment Health Serv58(99),4-6 doi: 10.3928/02793695-20200624-09
- Smith AC, Thomas E, Snoswell LC, Haydon H, Mehrotra A, Clemensen J, Caffery LJ.(2020).

  Journal of Telemedicine and Telecare.26(5),309–313 DOI: 10.1177/1357633X20916567
- Verma S, Mishra A.(2020). Depression, anxiety, and stress and socio-demographic correlates among General Indian public during COVID-19. Int J Soc Psychiatry,66(8),756-762. doi:10.1177/0020764020934508
- Wang W, Tang J, Wei F. (2020). Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. J Med Virol.92(4),441-447. doi:10.1002/jmv.25689
- Wild SH, Hanley J, Lewis SC, et al. (2016). Supported Telemonitoring and Glycemic Control in People with Type 2 Diabetes: The Telescot Diabetes Pragmatic Multicenter Randomized Controlled Trial [published correction appears in PLoS Med. 2016 Oct 19;13(10): e1002163]. PLoS Med.13(7),e1002098. Published 2016 Jul 26. doi: 10.1371/journal.pmed.1002098
- Zhang, L., & Liu, Y. (2020). Potential interventions for novel coronavirus in China: A systematic review. Journal of medical virology,92(5),479-490. https://doi.org/10.1002/jmv.25707
- Zhou, X., Snoswell, C. L., Harding, L. E., Bambling, M., Edirippulige, S., Bai, X., & Smith, A. C.(2020). The role of telehealth in reducing the mental health burden from COVID 19. Telemedicine and e-Health.26(4):377-379. https://doi.org/10.1089/tmj.2020.0068 a