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# Evaluating the Effect of Telenursing and Multimedia Self-Care Educational Program on the Level of Existential Anxiety in Patients with COVID-19: A Quasi-Experimental Study

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## Abstract

**Background & Objective:** For patients, COVID-19 disease is a reminder of non-existence and death. For this reason, these patients experience existential anxiety. One of the effective factors in the control and treatment of this disease is to educate patients on self-care to reduce the burden of these psychological problems on them. The present study was designed and conducted with the aim of evaluating the effect of self-care educational program using telemedicine and multimedia methods on the level of existential anxiety in COVID-19 patients.

**Materials & Methods:** This study was a quasi-experimental research conducted on 88 COVID-19 patients referred to the comprehensive health service centers of Bandar Abbas, Iran from 2020 to 2021. They were selected using a convenience sampling method. The samples were randomly assigned to the multimedia (44 patients) and telenursing (44 patients) groups. Patients in both groups received education on self-care during COVID-19 disease for 21 days. The Existence Anxiety Scale was completed before and immediately after the intervention. Data were analyzed with SPSS software version 26. Descriptive statistics, normality test, independent t-test, homogeneity of variance and covariance, univariate and multivariate analysis of covariance were used.

**Results:** The mean score of existential anxiety at the beginning of the study was 90.50± 12.57 and 85.25 ±16.12, respectively, in the telenursing and multimedia groups, and after the intervention, it was 46.88 ± 6.38 and 65.40 ± 9.59, respectively, in the telenursing and multimedia groups. After the intervention, the existential anxiety score was significantly reduced in the telenursing group compared to the multimedia group ($p < 0.001$).

**Conclusions:** Based on the findings of this study, self-care education programs and knowledge about necessary care during COVID-19 illness should be considered for patients in comprehensive health centers, and telenursing should be used for more effective self-care education.

**Keywords:** Self-care, Multimedia, Telenursing, Anxiety, COVID-19

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## Introduction

World Health Organization (WHO) recognized COVID-19 virus disease as an international emergency disease on January 30, 2020 (1, 2). COVID-19 virus is highly contagious and has a high mortality rate in some populations, but no specific treatment has yet been identified for it (3). COVID-19 disease has caused global awareness, anxiety and distress and has had a great impact on communities, economies and public health systems. The psychological effects of the disease, such as stress and anxiety, are also a matter of serious public concern (1-4). COVID-19 presents an unusual scenario, in which mortality is almost constantly highlighted (5). The reminder of death

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by COVID-19 disease reveals the existential anxiety. Existential anxiety usually remains at a latent level, but some situations, where one sees oneself close to death, activate it (6).

Based on the existential view, death, responsibility, loneliness, and instability are the definite and inevitable intrinsic features of human existence. Existential anxiety is the result of awareness of the unstable characteristics of human situations and appears in human beings when they face the phenomenon of death and non-existence despite their purposefulness and need for immortality (7).

Self-care activities can direct the person towards health and well-being, increase his or her adaptation, and reduce the level of disability of patients and treatment costs. The World Health Organization (2009) defines self-care as "the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and cope with disabilities and diseases" (8). There are several methods for training the client. The most common method of the education in the health care system is face-to-face education, which also has its shortcomings, such as its limitations in crowded centers and group discussions (9).

Also, face-to-face communication and face-to-face interaction is a challenge during the coronavirus pandemic (10). Nowadays, with the advancement of technology, telenursing method (use of information and telecommunication technology in nursing) can facilitate access to effective care, reduce costs, and improve the relationship between patients and nurses and reduce frequent examinations and remove barriers related to time and place by providing care using communication devices such as the Internet, telephone, video, etc. (11). Nowadays, the use of telenursing enables the nurse to perform actions such as patient monitoring, education, data collection, performing nurse interventions, pain control, and support for the patient's family (12). Some studies have shown that telephone follow-up and telenursing lead to improved self-care in patients and increased treatment adherence (13).

The term multimedia was raised around since 1950 onwards. With the combination of multiple media, efforts were made to enhance the quality of education, and these facilities facilitated advancement, interaction, creation, and better user-software communication. Multimedia education includes at least three elements, including images, sound, and interaction, and involves the use of computer-assisted education and CDs. One of the most effective reasons for this education is that it uses several senses simultaneously in the learning process. Therefore, such a tool can create a favorable learning environment for different people with different characteristics. The learner should select the materials prepared in the form of an educational CD and use them. One of the advantages of this method is individual education and lack of limitations on the time and duration of education (14).

Several interventional studies have been conducted in Iran and other countries to compare educational styles on patients, but interventional studies on the effect of using different educational styles are limited to the level of self-care and the level of existential anxiety of patients. The results of a study conducted by Vaghee et al. (2017) showed that both face-to-face and multimedia educational methods were effective in reducing anxiety caused by electroshock in patients with mood disorders, but this reduction in anxiety was greater in face-to-face educational method (9). The results of a study conducted by Fakharzadeh et al. in 2013 showed that the mean glycosylated hemoglobin and body mass index in the diabetic group under telenursing were significantly lower than the control group after the intervention (11). In the study conducted by Chakeri et al. (2020), anxiety scores of COVID-19 patients in both the lecture and telenursing groups decreased after the intervention compared to before the intervention, but this reduction was more in the telenursing group than the lecture group (15). The results of a study conducted by Yeganeh Khah et al. (2011) showed that different methods of education (face-to-face education, pamphlets and CDs)


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have significantly reduced the mean anxiety of patients with acute myocardial infarction. However, these three methods of education were not different in reducing the mean of patients' manifest anxiety (16).

The number of COVID-19 patients is increasing in Iran and many socio-emotional problems are imposed by this disease on the patients and their family. Also, many of these patients do not have sufficient information and knowledge about COVID-19 disease and self-care activities, so they do not have sufficient motivation and skills in performing self-care activities. Also, the focus of the media and the health care system in general is on preventing the spread of epidemics, and mental health problems that occur simultaneously with this disease are largely overlooked (17). Adequate research has been conducted on the self-care of these patients. Thus, the need for research on the design and implementation of self-care educational program based on the needs of these patients to increase their self-care capacity is essential. Therefore, the present study was carried out to examine the effect of self-care educational program using two methods of multimedia and telenursing on the level of existential anxiety of COVID-19 patients in 2019 in Bandar Abbas in 2020-2021.

## Materials and Methods

### Study design and setting

The present study was a quasi-experimental study conducted on COVID-19 patients referred to comprehensive health service centers in Bandar Abbas, Iran from 2020 to 2021. The city of Bandar Abbas includes 22 comprehensive health service centers, 5 of which were considered for referral of COVID-19 patients. Comprehensive health service centers, health centers and medical centers are the first level of providing health services to the people and are responsible for caring for the health and life of the community. Patients with COVID-19 were referred to a medical center for PCR testing and care during their illness.

### Study participants and sampling

The sample size was estimated at 38 people in each group according to the study of Hemati et al (18) (S1 = 5.27, S2 = 5.31) and ($\mu 1$=28.9, $\mu 2$=25.46) with 95% confidence interval and 20% type II error and 80% power.

$$n = \frac{\left(z_{1-\frac{\alpha}{2}} + z_{1-\beta}\right)^2 (S_1^2 + S_2^2)}{(\mu_1 - \mu_2)^2} = 38$$

Due to probability of dropout in samples, 44 samples were selected in each group. COVID-19 patients were selected by using a convenience sampling method and randomly assigned to one of the telenursing or multimedia groups.

### Data collection tool and technique

Data collection tools were a two-part demographic questionnaire, and Existential Anxiety Scale. The first part of the demographic questionnaire was related to demographic information. Patient's personal characteristics included age, gender, marital status, education, occupation, residential status, duration of disease, having information about COVID-19 disease, source of obtaining education about COVID-19 disease, chronic disease, cause of COVID-19 disease, having family members in the medical staff, family members affected by COVID-19 disease, a family member death due to this disease, and home care by family members.

Existential Anxiety Scale was used to measure existential anxiety. This questionnaire has 29 questions with 4 subscales of death and non-existence anxiety (questions 4, 8, 11,16, 20, 24 and 28), responsibility anxiety (questions 1, 5, 9, 13, 17, 21, 26 and 27), loneliness anxiety (questions 2, 6, 10, 14, 18 and 22) and meaning anxiety (questions 29, 3, 3, 7, 12, 15, 19, 23 and 25).

Scores on a Likert scale is from one (not at all) to four (very high). To get the total score of the questionnaire, the scores of all the questions are summed up. Scores range from 29 to 116. The range of scores in

anxiety of death and non-existence is from 7 to 28, the range of scores in the anxiety of responsibility is from 8 to 32, the range of scores in the loneliness anxiety is from 6 to 24, and the range of scores in meaning anxiety dimension is from 8 to 32. A low score indicates ignoring existential anxiety and a high score indicates a high existential anxiety. Masoudi Sani et al. (2016) reported the content validity of the tool based on the opinion of 10 experts by the ICC method at 95%. Also, the concurrent and convergence validity of this tool were reported at 82% and 55%, respectively. Also, the reliability of the questionnaire by Cronbach's alpha and test-retest methods were reported at 82% and 86%, respectively (7). The reliability of this questionnaire in this study using Cronbach's alpha coefficient method varied from 60% to 95% in four subscales of (death and non-existential dimension: 0.93, responsibility dimension: 0.90, loneliness dimension: 0.88, meaning dimension: 0.60).

After obtaining the necessary permissions, the researcher referred to the research environment and after obtaining the permission from the Department of Comprehensive Health Services Centers in Bandar Abbas, he started sampling. The researcher referred to comprehensive health service centers in the morning shift and examined the patients suspected to COVID-19 and the patients with a definite diagnosis of COVID-19 were included into the study. The inclusion criteria included having the COVID-19 disease in the last three days, being in the age range of 18 to 60 years, lack of hearing and speaking problems, no mental illness, no history of severe mental disorders, having at least a diploma level of education, minimum familiarity with Windows and the way of using CD, having mobile and landline phone, the ability to communicate via telephone, and having access to computer.

After providing explanations about the study method, the research obtained the subjects' written consent to participate in the study. Exclusion criteria included patients who were in a critical condition during the study, died during the intervention, disconnected from the phone more than once in the telenursing group during the sampling period, lacked self-care reports using training programs during self-care-based activities, lacked adequate communication, and did not provide response to the researchers' call for follow-up visits by the multimedia education group. Then, the method of filling out the questionnaires and the education process was explained to the samples and the patients were also assured that participating in this study will not interfere with the treatment process and the patient information will remain confidential. It was done after the visit by the physician and the provision of health services by the center so that there is no disruption in the treatment process of these patients and the patient has enough time to answer the questionnaire.

To observe random block allocation, numbers 1 to 88 were assigned to the patients of the study, and in accordance with the results of randomization and the relevant number, they were allocated to the study groups (telenursing or multimedia) in a randomized block using random allocation software. Samples of telenursing group received phone calls for three weeks and three 20-minute calls per week. The time of each call was determined in cooperation with the sample. Also, every week, educational messages and educational videos related to the content were prepared, and exactly the same as the multimedia group, they were sent after contacting the samples in the group formed in mobile-based messenger. This group had two-way interaction and questions were asked and answers were given to them.

Regarding the multimedia group, a multimedia educational CD was submitted to the patients at the beginning of the intervention and after completing the questionnaires. If the patient cannot use the CD, the multimedia contents on the flash memory were submitted so that the patient can transfer the content to his or her computer or


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laptop. It contained educational short videos and educational Power Points related to the mentioned items. To remind the multimedia group and follow them up, a reminder message was sent to the group formed in mobile-based messenger every week, and questions were asked and answers were given to them. The educational content was prepared by the researcher using the guidelines developed by the World Health Organization, the Ministry of Health and Medical Education and the review of scientific texts. Its scientific content was approved by the professors and its content validity was examined and approved.

The content of this education includes a set of self-care programs including familiarity with COVID-19 disease and its symptoms, ways of transmitting COVID-19 disease, COVID-19 disease latency period, managing shortness of breath, management of daily life activities, management of memory and concentration problems, management of eating, drinking and swallowing, management of voice and speech problems, management of diarrhea and nausea, management of sore throat, management of cough, management of headache, management of fever, management of psychological issues, ways to reduce anxiety (anger management, stress management, stop thinking, breathing and muscle relaxation, and cognitive reconstruction), management of anxiety and mood problems, management of daily life activities, maintaining social relationships, nutrition during quarantine, sleep and rest, ways to improve sleep quality, exercise and mobility, sexual intercourse, home quarantine, isolation, home care planning, self-care, corona prevention methods, use of personal protective equipment, home care, ways of washing hands, knowing when to contact the physician (19-29). The Existential Anxiety Scale was collected electronically (by link) after the intervention. Diagram 1 shows the process of sampling and carrying out the intervention. SPSS-26 software was used to analyze the research objectives. Descriptive statistics (number and percentage, mean and standard deviation) were used to describe the characteristics of the samples. Independent t-test was used to determine the similarity of the two groups in terms of demographic variables. To test the research hypotheses, statistical tests such as normality (Shapiro-Wilk test) and homogeneity of variance and covariance of observations in groups were examined and the results of univariate and multivariate analysis of covariance were reported to compare scores of existential anxieties.

**Ethical Consideration**

Medical Ethics Committee of the Hormozgan University of Medical Sciences approved this research (IR.HUMS.REC.1399.578). Informed consent was obtained from all patients who were involved in the research process. Participants were informed about purpose of study and confidentiality of information. The participants were free to withdraw from the study anytime.


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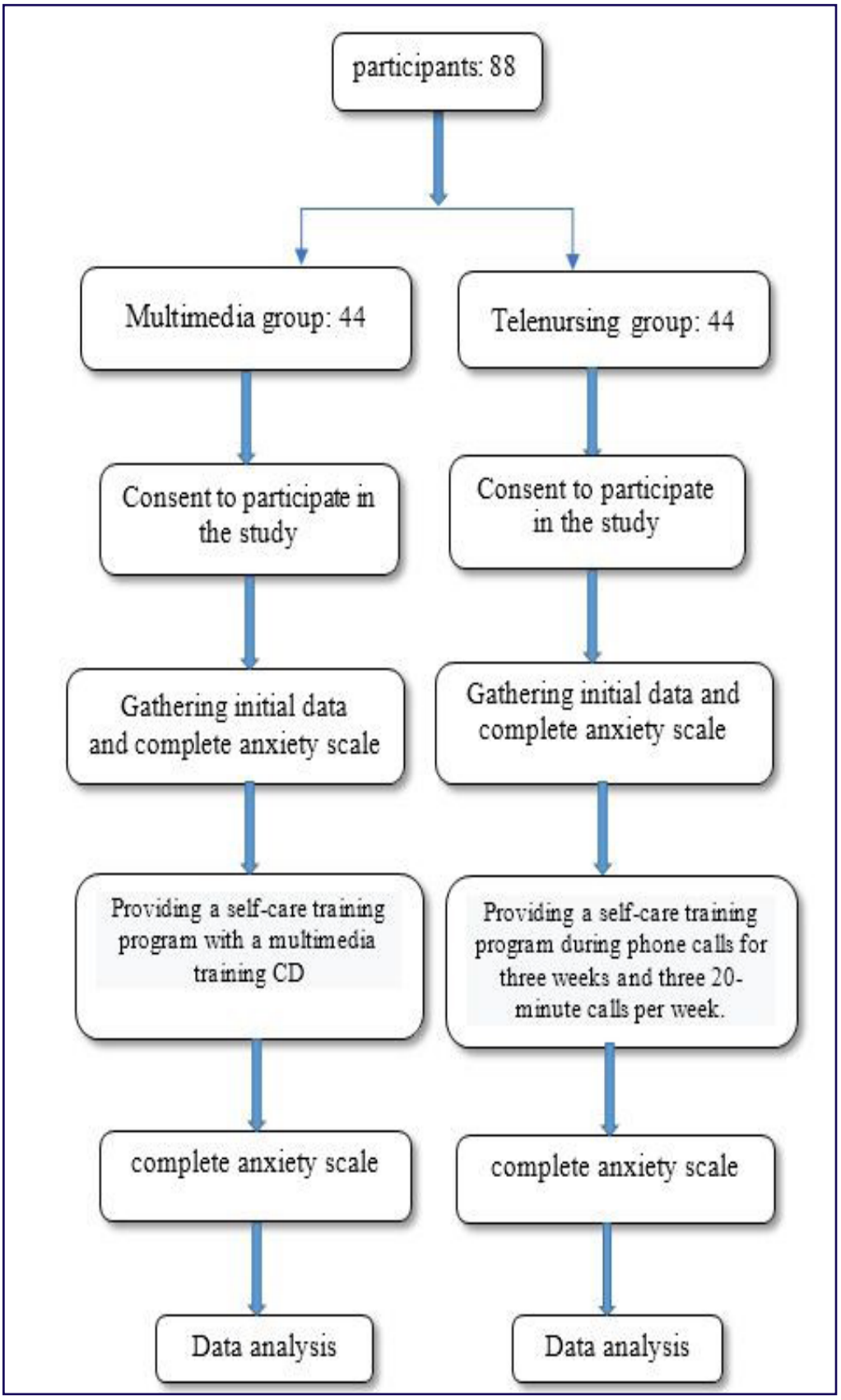
**Diagram 1.** The consort diagram for levels of the study





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## Results

In the present study, a total of 139 patients were studied. Among them, 46 did not meet the inclusion criteria. Five samples in the telenursing and multimedia groups were excluded during the study (2 people in telenursing group due to not answering the phone for more than one session, 2 people due to not filling out the self-care education report in both groups, 1 person due to not responding to SMS in the multimedia group). Finally, the analysis was performed on 88 samples (44 in the telenursing group and 44 in the multimedia group). The mean age of patients in the telenursing and multimedia groups was 36.91 ± 8.25 33.50 ± 7.12, respectively. The mean duration of COVID-19 disease was 1.70 ± 0.55 days in the telenursing group and 1.72 ± 0.54 days in the multimedia group. The majority of people in the telenursing group (54%) and multimedia (46%) were male.

Also, 77.28% of the patients in the telenursing group and 79.54% in the multimedia group were married. Majority of samples in the telenursing (38.63%) and multimedia (47.73%) groups were employed. Also, 34.10% of the samples in the telenursing group had an associate's degree and 38.63% of the samples in multimedia group had a bachelor's degree. Also, 90.90% of the samples in the telenursing group and 95.45% of the samples in the multimedia group lived in Bandar Abbas. Majority of the samples in both groups (telenursing = 100% and multimedia = 97.72%) had information about COVID-19. Also, 63.06% of patients in the telenursing group and 43.2% of patients in the multimedia group received information about Coronavirus from television. The majority of patients in the telenursing group (77.28) and in the multimedia group (84.09%) did not have chronic disease. Also, 73.73% of the patients in the telenursing group and 56.81% in the multimedia group attributed the cause of COVID-19 to having contact with a positive COVID-19 person. The majority of patients' families were infected with COVID-19 in the telenursing group (65.90%) and in the multimedia group (59.09%). Also, 86.36% of patients in the telenursing group and 75% of the patients in the multimedia group did not have medical staff in their family members. Also, 4.55% of the patients in the telenursing group and 13.65% of the patients in the multimedia group had lost their loved one due to COVID-19. The majority of patients in both groups (telenursing = 88.63, multimedia = 97.72%) had someone to take care of themselves. There was no significant difference between the two groups of telenursing and multimedia in terms of these variables ($P > 0.05$). The normality of the variables was checked with the Shapiro-Wilk test. Independent t-test showed that dimensions were not significantly different in the two groups of telenursing and multimedia before the intervention, except for death dimension ($p = 0.041$). The difference between the scores before and after the intervention was compared in the two groups. The results of independent t-test showed that the scores were significant for all dimensions in the telenursing and multimedia group ($p <0.001$). These changes in the scores in all dimensions were significantly better in telenursing than the multimedia group ($p <0.001$) (Table 1).

In the present study, the normality of the difference in scores before and after the intervention for the variable of existential anxiety and its subscales was evaluated separately using the Shapiro-Wilk test for the two groups. It was observed that the p-value for all subscales (except the death subscale in the telenursing group, ($p = 0.019$) in both groups was higher than the significance level of 0.05, indicating that the distribution of observations of this subscale follows the normal distribution. According to Table 2, the results of Wilks' Lambda test showed that the total scores of anxiety in the two groups were significantly different. Also, the study of subscales showed that the two subscales of responsibility ($p = 0.035$) and death ($p <0.001$) in the two groups of telenursing and multimedia


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**Table 1.** Comparison of the mean changes in the dimensions of existential anxiety in the two groups of telenursing and multimedia

| dimensions of existential anxiety | Group | Before intervention | After intervention | Mean changes before and after |
|---|---|---|---|---|
| | | Mean± SD | Mean± SD | Mean changes± SD |
| Meaning | Telenursing | 21.45±3.70 | 13.11±1.80 | -12.34±0.544 |
| | multimedia | 24.36±4.69 | 18.50±2.82 | -5.86±0.544 |
| | Independent t-test | 0.229 | <0.001 | <0.001 |
| Responsibility | Telenursing | 21.97±4.02 | 11.09±2.17 | -10.88±0.553 |
| | multimedia | 20.50±5.16 | 15.79±2.89 | -4.70±0.467 |
| | Independent t-test | 0.138 | <0.001 | <0.001 |
| Loneliness | Telenursing | 17.29±2.93 | 8.72±1.61 | -8.56±0.426 |
| | multimedia | 16.20±3.99 | 12.25±2.10 | -3.95±0.398 |
| | Independent t-test | 0.148 | <0.001 | <0.001 |
| Death | Telenursing | 25.77±3.29 | 13.95±1.85 | -11.81±0.416 |
| | multimedia | 24.18±3.85 | 18.86±2.63 | -5.31±0.351 |
| | Independent t-test | 0.041 | <0.001 | <0.001 |
| Total | Telenursing | 90.50±12.57 | 46.88±6.38 | -43.61±1.67 |
| | multimedia | 85.25±16.12 | 65.40±9.59 | -19.84±1.41 |
| | Independent t-test | 0.092 | <0.001 | <0.001 |


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are significantly different from each other.

The results of multivariate analysis of covariance showed that the mean scores of responsibility (p = 0.003), loneliness (p = 0.015) and death (P < 0.001) were significantly higher in the telenursing and multimedia groups after the intervention than before the intervention. However, for the meaning dimension, despite the decrease in score after the intervention, no significant difference was observed between the scores before and after the intervention (p = 0.537).

The results of multiple analysis of covariance showed that by controlling the pre-test effect of each dimension of existential anxiety, the mean score of meaning dimension in the telenursing group (13.11 ± 1.80) was significantly less than multimedia (18.50 ± 2.82) (Table 2). The mean dimension of responsibility after intervention (11.09 ± 2.17) is significantly lower than the multimedia group (15.79 ± 2.89). The mean dimension of loneliness after intervention in the telenursing group (8.72 ± 2.61) was significantly lower than the multimedia group (12.25 ± 2.10). Also, the mean of death dimension in the telenursing group (13.95 ±1.85) was significantly less than the multimedia group (18.86 ± 2.63) (p <0.001).

**Table 2.** Results of multiple analysis of covariance for the dimensions of existential anxiety

| Dimensions of existential anxiety before intervention | results | | | | |
|---|---|---|---|---|---|
| | value | F | P | Eta square | Test power |
| Meaning | 0.913 | 1.872 | 0.124 | 0.121 | 0.544 |
| Responsibility | 0.879 | 2.721 | 0.035 | 0.131 | 0.728 |
| Loneliness | 0.927 | 1.561 | 0.193 | 0.073 | 0.462 |
| Death | 0.752 | 6.515 | <0.001 | 0.263 | 0.988 |
| Group (telenursing and multimedia) | 0.195 | 81.373 | <0.001 | 0.724 | 1.000 |

Adjusted R Squared analysis of covariance test was used to evaluate the goodness of fit. The results for four dimensions of existential anxiety showed that R Squared is 0.75 for meaning dimension, 0.74 for responsibility, 0.68 for loneliness, and 0.77 for death dimension. The results indicate the proper fit of the model of multivariate analysis of variance on these observations (Table 3).


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**Table 3.** Results of multivariate analysis of variance between groups before and after intervention in the dimensions of existential anxiety

| Source of changes | Dependent variable | sum of squares type III | Mean of squares | f-value | p-value | Eta Square | R square-adjusted | Test power |
|---|---|---|---|---|---|---|---|---|
| Dimensions of social isolation before intervention | Dimensions of social isolation after intervention | | | | | | | |
| Loneliness | Loneliness | 410.17 | 410.17 | 623.8 | 004.0 | 095.0 | 62.0 | 827.0 |
| Helplessness | Helplessness | 971.13 | 971.13 | 753.7 | 007.0 | 086.0 | 62.0 | 786.0 |
| Social desperation | Social desperation | 084.5 | 084.5 | 249.2 | 381.0 | 027.0 | 65.0 | 317.0 |
| Decreased social tolerance | Decreased social tolerance | 115.31 | 115.31 | 512.20 | 001.<0 | 200.0 | 68.0 | 994.0 |
| Group (telenursing and multimedia) | Loneliness | 779.255 | 779.255 | 678.126 | 001.<0 | 607.0 | - | 000.1 |
| | Helplessness | 165.205 | 165.205 | 844.113 | 001.<0 | 581.0 | - | 000.1 |
| | Social desperation | 423.271 | 423.271 | 078.120 | 001.<0 | 594.0 | - | 000.1 |
| | Decreased social tolerance | 195.196 | 195.196 | 337.129 | 001.<0 | 612.0 | - | 000.1 |
| Error | Loneliness | 568.165 | 019.2 | | | | | |
| | Helplessness | 78.147 | 802.1 | | | | | |
| | Social desperation | 35.185 | 260.2 | | | | | |
| | Decreased social tolerance | 39.124 | 517.1 | | | | | |

Based on the results of one-variable analysis of covariance in table 4, the mean of existential anxiety after intervention in both groups was significantly reduced compared to before the intervention (P <0.001). The results of this test also showed that the total score of existential anxiety after the intervention in telenursing group (46.88 ± 12.57) decreased significantly more than the multimedia group (65.40 ± 16.12) (P < 0.001). The Adjusted R Squared index was obtained at 0.787, indicating that 0.778.7 of the changes in the existential anxiety after the intervention is explained by the variable of type of intervention.

**Table 4.** Results of univariate analysis of covariance for total score of existential anxiety

| Source of changes | sum of squares type III | df | Mean of squares | F value | P value | Eta square | Test power |
|---|---|---|---|---|---|---|---|
| Existential anxiety before intervention | 668.2956 | 1 | 668.2956 | 176.91 | 001.0> | 518.0 | 000.1 |
| Group (telenursing and multimedia) | 735.9076 | 1 | 735.9076 | 902.279 | 001.0> | 767.0 | 000.1 |
| Error | 400.2756 | 85 | 428.32 | | | | |
| Adjusted R Squared=0.787 | | | | | | | |

## Discussion

The results of the present study revealed that the total score of existential anxiety dimensions in the telenursing group decreased significantly compared to before the intervention, indicating the effect of telenursing self-care education on the level of existential anxiety. In the study conducted by Chakeri et al. (2016), the mean score of anxiety level of people with coronavirus decreased significantly after the telenursing educational program (15). In the study conducted by Wei et al. (2020), the results showed that the anxiety scores of patients before the intervention were significantly reduced in the intervention group one week and two weeks after the intervention compared to the control group. It indicates the effectiveness of integrated Internet-based intervention in anxiety symptoms in COVID-19 patients (30).

The study conducted by Asadi et al. (2014) indicates that nurses' telephone calls could significantly reduce the family anxiety of patients hospitalized in the intensive care unit (31).

In explaining the results obtained in


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the present study, it can be stated that the sue of telenursing can be effective in reducing anxiety and stress due to the impossibility of holding educational courses to reduce anxiety and stress. Also, telephone information and telenursing self-care education without time and space limitation seems to cover this issue and patients can communicate with their nurse via phone or internet and ask their questions and be aware of their medical condition, treatment and disease. Answering the questions and resolving the worries of the patient and his or her family and reducing the anxiety of death and meaning and loneliness and non-existence can reduce the anxiety of the patients (32). The results of this study showed that, compared with pre-education, the scores of the dimension of anxiety in the multimedia group decreased significantly after the intervention, indicating the effectiveness of the intervention. The results of a study conducted by Vaghee et al. (2017) showed that multimedia education was effective in reducing anxiety in patients with mood disorders caused by electroshock (9).

The results of a study conducted by Yeganeh Khah et al. (2011) showed that CD-ROM education, which was one of the various methods of multimedia education in the mentioned study, significantly reduced the mean anxiety of patients with acute myocardial infarction (16). The results of the study conducted by Rabiee et al. (2014) showed that the use of educational multimedia was effective in reducing patients' anxiety before cesarean section and can be used for other patients before surgery (33). In the study conducted by Fahimi et al., on 110 patients who were candidates for coronary artery surgery, the results showed that the mean anxiety score of patients trained through multimedia was significantly lower than the control group after the intervention and educational interventions through multimedia were recommended to reduce anxiety in these patients (34). In explaining the results obtained in the present study, it can be stated that Coronavirus, due to its nature and quarantine and physical isolation, has minimized access to health staff to receive care. Self-care education through multimedia education due to receiving education through CDs and disks can be effective in increasing awareness for self-care of coronavirus patients without the direct need to contact health staff and this effect can reduce anxiety, existential anxiety, and other psychological problems.

The results of the present study revealed that the total score of existential anxiety after the intervention decreased significantly more in the telenursing group than the multimedia group. There was a statistically significant difference between the types of self-care education. It can be said that telenursing self-care education had a greater effect than multimedia education. Due to the emergence of COVID-19 disease and the concept of existential anxiety in Iranian studies, in most studies conducted on the effect of the intervention on the level of existential anxiety, the type of intervention has been different and the present study is novel in terms of type of intervention. In the study conducted by Chakeri et al. (2020) on 100 COVID-19 patients who were treated at home according to the physician's guidelines, the results showed that the level of anxiety in the two groups was significantly different after the educational program and the mean score of anxiety level decreased significantly after the telenursing education program. This reduction was greater in the telenursing group than in the lecture group (15).

The study conducted by Vaghee et al. (2017) on 75 patients with mood disorders under ECT in Iran showed that both face-to-face and multimedia educational methods were effective in reducing anxiety, but this reduction in anxiety was more in face to face education (9). It was inconsistent with the results of the present study. The reason for this difference in the results may be attributed to differences in the research populations and educational differences. Also, in the study conducted by Vaghee et al., all samples initially received face-to-face education and educational intervention is also considered in this discrepancy of the results.

The results of a study conducted by Yeganeh Khah et al. (2011) showed that different methods of education such as face-to-face, pamphlet, and CD education significantly reduced the mean anxiety of patients with acute myocardial infarction, although these three methods of education were not different in reducing the mean manifest anxiety of patients and the use of all three methods is recommended (16). It was inconsistent with the results of the present study. One of the reasons for the difference in results may be the differences in the study population of patients with myocardial infarction. Based on the results of the study conducted by Yeganeh Khah et al, approximately 72% of patients have severe anxiety and patients with myocardial infarction suffer high level of stress (16). Also, the type of educational intervention of the mentioned studies is different from the present study and only CD was used for teaching in the multimedia group in the present study. Also, the differences might be related to educational interventions such as educations on myocardial infarction, which is an acute disease with long-term consequences for the patient. In explaining the results of this study, it can be stated that telenursing, as an essential part of health care services, helps the patient and his or her family to be active in the treatment process and to be successful in controlling diseases.

Telenursing in providing care not only reduces costs and facilitates access to care, but also improves the relationship between the patient and the care providers. Telenursing helps the patient and his or her family to actively take the necessary care at home with more awareness and self-confidence and to follow the prescribed treatment plan (35). Considering the benefits of telenursing based on the mentioned studies, the greater effectiveness of telenursing in the level of existential anxiety than multimedia education may be attributed to more communication and more awareness of clients in their current status and solving their problems. In telenursing, the researcher has a direct relationship with the client and solves his or her problems and the necessary educations for self-care are likely to be more effective than receiving the educational CD.

### Limitation and recommendation

Limiting the research on COVID-19 patients and not paying attention to other family members of patients is another limitation of the present study. Due to the lack of physical presence of the researcher and self-care education in telenursing and multimedia, motivation of research samples to participate and continue the research decreased, which was one of the limitations of the present study. Also, impatience or unfavorable physical and mental condition due to the nature of COVID-19 disease prevented patients from performing the intervention or continuing the intervention.

## Conclusion

In the present study, the results revealed that the existential anxiety score of COVID-19 patients decreased significantly after performing self-care educational interventions by multimedia and telenursing methods, but this decrease was significantly higher in the telenursing group. Based on the results of the present study, the educational role of the nurse who has the most contact with patients, can be seen in reducing patients' psychological problems. Based on the results of the present study, it can be concluded that telenursing method as a new and effective method is more effective than multimedia education method in reducing the anxiety of COVID-19 patients. Thus, the telenursing method can be used for self-care education in the area of patient education, which is one of the most important tasks of nurses. Also, due to the effectiveness of multimedia education, nurses are recommended to use multimedia methods and educational CDs, etc. in cases where they have little access to their patients, for self-care education of the patients. Further studies are recommended to examine the barriers to telenursing self-care education and compare it with other educational methods in patients with COVID-19.


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## Conflict of Interests

Authors declare no conflicts of interest.

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