Impact of Virtual Training of Jacobson and Benson Relaxation Techniques on the Anxiety among Home-Isolated COVID-19 Patients

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Background: High anxiety is a common mental symptom in COVID-19 patients, mainly due to the unknown nature of the disease and the home isolation of patients for recovery. The aim of this study is to determine the impact of the virtual training of relaxation techniques, including Jacobson and Benson techniques, on the anxiety of home-isolated patients with COVID-19.

Materials and Methods: This clinical trial was conducted in 2020 in Hamadan Sina Hospital, where 60 COVID-19 patients were randomly allocated to an experimental (n = 30) and a control (n = 30) group. Both groups received the usual care. However, in addition to the usual care, COVID-19 patients in the experimental group received relaxation technique training, including Jacobson and Benson techniques, in the form of pamphlets and instructional videos according to the schedule (twice a week for 4 weeks) via WhatsApp. The Spielberger Anxiety Inventory was filled out by subjects before and after the intervention.

Results: The mean scores of explicit, implicit, and overall anxiety were not significantly different between the control and experimental groups prior to the intervention (P>0.05). However, the mean score of explicit, implicit, and overall anxiety in the control and experimental groups differed significantly after the intervention (p<0.05).

Conclusion: The results of this study showed that Jacobsen and Benson relaxation techniques are effective in reducing anxiety among COVID-19 patients. Therefore, it is recommended to perform complementary therapeutic interventions for these patients, in addition to the administration of medications.

Keywords: Relaxation; Anxiety; COVID-19

INTRODUCTION

Since late 2019, a new member of the coronavirus family has been threatening human society. Infection with the new coronavirus, later known as COVID-19, raised serious concerns for it was for the third time in less than two decades that the world was facing a deadly coronavirus epidemic (1). Unfortunately, the virus spread rapidly throughout the world and became a pandemic within four months (2). According to reports, from its outbreak until January 24, 2022, over 349 million confirmed cases and over 5.5 million deaths have been reported worldwide, and the numbers are still on the rise (3).

With the increasing number of positive cases and the high number of related deaths, many mental problems

such as anxiety, have been observed among the infected individuals and those at risk of the disease (4-7). The main causes of anxiety in COVID-19 patients are fear of its fatal outcome and the physical effects (8). Moreover, home isolation due to coronavirus infection might be another reason for anxiety disorders (9). Increasing the cortisol level due to mental stress and anxiety could have a negative effect on the immune system and also cause more vulnerability against the disease (10). Following the outbreak of COVID-19, Duan and Zhu reported mental distress in patients and high-risk individuals and emphasized the need for appropriate interventions to reduce mental distress in patients and high-risk individuals (11).

One of the non-expensive therapies in complementary medicine for reducing anxiety that does not require any special tools or medical prescriptions is the relaxation technique (Jacobson and Benson) (12). Unlike many other relaxation techniques that cause drowsiness, increase one's stress and anxiety, and are difficult to learn, the Jacobson and Benson relaxation techniques do not require any special tools or prescriptions and can be implemented virtually, considering the contagious nature of the disease (13). Patients use the received training to reduce their anxiety when facing anxiety or mental distress caused by a disease, especially when these pieces of training are easy and accessible (14). In the study by Kadivar et al., the positive impact and effectiveness of virtual education has been confirmed (15).

The transmissibility of the disease and, subsequently, the uneasy access to patients for training, the anxiety caused by the disease and home isolation, the lack of sufficient studies on the impact of the virtual combination of two relaxation techniques, i.e. Jacobson and Benson, virtually on COVID-19 patients raised a question in the researcher's mind: considering people's easy access to the Internet and smartphones, would sending accurate educational materials on the disease along with training relaxation techniques, Jacobson and Benson, reduce the anxiety of COVID-19 patients during the disease? Therefore, given the importance of the above-mentioned, this study was conducted to determine the impact of the virtual training of relaxation techniques, Jacobson and Benson, on the anxiety of home-isolated COVID-19 patients.

MATERIALS AND METHODS

The present study is a two-group parallel randomized clinical trial. The study population consisted of COVID-19 patients visiting Hamadan Sina Hospital. Considering a confidence level of 95% and the test power of 90%, and according to the results of a similar study (10), the sample size was calculated to be 60. A total of 60 patients meeting the inclusion criteria were selected through convenience sampling and using a random allocation sequence with a block size of four. They were allocated to the experimental (n = 30) and control (n = 30) groups. After determining the random sequence (ABAB, ABBA, BAAB, AABB, BBAA, BABA), each of the sequences were written down on a card and placed in a sealed envelope. Finally, 60 sealed envelopes were provided to the primary researcher.

The inclusion criteria consisted of 20-65 years old outpatient COVID-19 confirmed cases [based on lung CT scan and molecular (PCR) test] and being home-isolated based on the physician's order, with access to WhatsApp application on his/her smartphone. Other inclusion criteria included: diagnosis of the disease in the last 3 days, no other acute diseases, no history of stimulant and psychedelic use, no history of depression and other mental disorders, no use of sedatives or anti-anxiety drugs during the study, no hearing or vision problems to watch Jacobsen and Benson muscle relaxation training videos, no history of stimulants and psychedelic drugs during the research, no history or simultaneous use of typical complementary therapy approaches such as yoga, psychotherapy, Pilates, meditation, etc. The exclusion criteria consisted of the deterioration of the patient's condition and hospitalization, developing any new debilitating diseases, the

unwillingness to further participate in the research, showing severe physical and mental problems during the research (as stated by the patient via WhatsApp), and the patient's death. Because all COVID-19 patients were isolated at home, and the study was started in all samples within the first 3 days after diagnosis, all samples were identical in severity and duration of infection.

Data were collected using demographic and clinical information form [including age, gender, fever, cough and sputum, fatigue, digestive problems (diarrhea, vomiting, nausea), dyspnea, decreased sense of smell and taste, soreness and muscular pain, sore throat, chest pain or pressure, being asymptomatic or not, chest X-ray results] and Spielberger Anxiety Inventory.

This Spielberger anxiety inventory has 40 questions, 20 of which measure situational anxiety and 20 questions that measure personality anxiety. In this questionnaire, there were both positive and negative items, and items 1, 2, 5, 8, 10, 11, 15, 16, 19, 20, 21, 23, 26, 27, 30, 33, 34, 36 and 39 are reverse scored. To measure each subject's score, the sum of all 20 items is calculated for each scale. Therefore, the scores of each of the two scales of situational and personality anxiety can fall between 20 and 80. The scores between 0 and 20 indicate being normal and the scores between 21 and 40, mild anxiety. The scores of 41-60 and 61-80 show moderate and severe anxieties, respectively. Total anxiety score is obtained by summing up the scores of situational and personality anxieties. Therefore, the scores of 0-40 show no anxiety, the scores of 41-80 mild anxiety, the scores between 81 and 120 moderate anxiety, and those between 121 and 160, severe anxiety (16). Based on the standardization performed by Mahram in Iran and after calculating Cronbach's alpha, the reliability was reported to be 0.91 for the explicit anxiety, and 0.94 for the whole scale (17).

The patients with COVID-19 were placed in a control and an experimental group after visiting the doctor and home isolation. After randomly assigning the subjects to the two groups of intervention and control and collecting patients' telephone numbers in person, before the intervention, the link of research questionnaires for patients of both groups was sent via WhatsApp and completed by them. During the research, the control group received routine pharmacological and non-pharmacological isolation care at home, as prescribed by their physician. In the experimental group, in addition to the routine care, some intervention was performed: the pamphlets and instructional videos of Jacobson and Benson relaxation techniques were sent to COVID-19 patients via WhatsApp messenger in the form of 8 educational messages according to the schedule.

The first message included an introduction and stated the objectives of the training, as well as the rules and regulations. The second message consisted of an introduction to COVID-19, questions, and answers. The third message contained an introduction to muscles and the muscle groups involved in relaxation, in the form of texts and instructional videos. Messages 4, 5, and 6 included Jacobson and Benson relaxation training in the form of audio files, pamphlets, and educational videos. Message 7 included deep breathing training in the form of texts and instructional videos. Message 8 consisted of feedback on the exercises of previous sessions. While sending educational materials to the patients, the researcher ran Q&A sessions, ensuring that the techniques were learned and implemented. If necessary, video calls were also made during the training process.

After classifying the patients into two groups of intervention and control, the schedule of sending the educational program was provided to the experimental group patients. Furthermore, one day before each scheduled session, a reminder message was sent to the patient via WhatsApp. Each individual was sent messages twice a week for four weeks. It should be noted that the patients in the experimental group were strongly asked not to send educational materials to others. In addition, in the experimental group, subjects were contacted between sessions, via WhatsApp or, if necessary, telephone calls to

ensure Jacobson and Benson techniques were learned and performed correctly. Jacobson and Benson relaxation techniques were taught by the researcher after completing the training courses and reading related articles and books. After the intervention was done in the experimental group, the Spielberger Anxiety Inventory was filled out again immediately after the 4th week of intervention in the experimental and control groups through WhatsApp. To follow research ethics, after completing the post-intervention questionnaires, the educational materials regarding Jacobson and Benson relaxation techniques were sent to the control group subjects.

This study has been registered in the Iranian Registry of Clinical Trials under the code IRCT20160110025929N34. The ethical permit was issued by the Ethics Committee under the code IR.UMSHA.RE.1399.563. Other ethical considerations were also addressed, including obtaining written informed consent form the research participants, ensuring the confidentiality of information, and granting research samples the right to participate in or withdraw from the research.

The software SPSS Version 25 was used to analyze the data. Statistics such as frequency, percentage, mean and standard deviation were used to describe the data. To analyze the data, the chi-square test and, if necessary, Fisher's exact test, independent t-test, and dependent t-test were applied. Moreover, if the assumption of normality was not met in the groups, non-parametric equivalents of tests, namely Mann-Whitney U and Wilcoxon tests were performed.

RESULTS

In the present study, 242 patients with COVID-19 were evaluated in terms of the inclusion criteria, 182 of whom were excluded from the study. Moreover, 123 patients did not meet the inclusion criteria and 51 did not have the willingness to participate in the study. 8 patients were excluded from the study for other reasons. Finally, 60 patients with COVID-19 were selected and allocated to control and experimental groups. Both groups received routine care, while the experimental group also received relaxation intervention i.e., Jacobson and Benson techniques. Statistical analysis was performed on 60 patients (Figure 1).

According to the results of the study, the majority of samples in both the experimental group (66.7%) and the control group (80%) were in the age range of 36-50 years. In addition, the majority of samples were female in both intervention (53.3%) and control (56.7%) groups. The two groups were similar in age, gender, fever, cough and sputum, fatigue, digestive problems, dyspnea, decreased sense of smell and taste, soreness and muscular pain, sore throat, chest pain or pressure, being asymptomatic or not, and chest x-ray ($p > 0.05$) (Table 1).

Before the intervention, the scores of overall, explicit, and implicit anxieties showed no significant difference in the control and experimental groups ($p > 0.05$). However, after the intervention, the scores of overall, explicit, and implicit anxieties were significantly different in the control and experimental groups (Table 2 and 3).
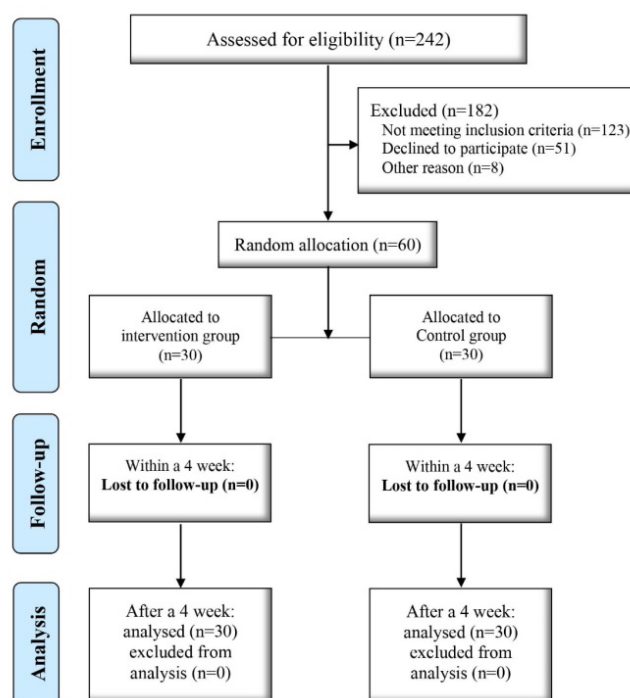

Figure 1. CONSORT flowchart of the study

Table 1. Individual and clinical characteristics of the participants

Variables	Control N (%)	Intervention N (%)	P-Value
Age			
20-35	0(0)	2(6.7)	
36-50	24(80)	20(66.7)	0.419*
51-65	6(20)	7(23.3)	
>65	0(0)	1(3.3)	
Gender			
Male	13(43.3)	14(46.7)	0.795**
Female	17(56.7)	16(53.3)	
Fever			
37-38	0(0)	1(3.3)	
38-39	16(53.3)	20(66.7)	0.288*
>39	14(46.7)	9(30)	
Cough and sputum			
Yes	18(60)	17(56.7)	0.793**
No	12(40)	13(43.3)	
Fatigue			
Yes	28(93.3)	29(100)	0.492*
No	2(6.7)	0(0)	
Digestive problems			
Yes	13(43.3)	15(50)	0.605**
No	17(56.7)	15(50)	
Shortness of breath			
Yes	25(83.3)	23(76.7)	0.519**
No	5(16.7)	7(23.3)	
Loss of smell and taste			
Yes	22(73.3)	20(66.7)	0.573*
No	8(26.7)	10(33.3)	
Muscle bruising and pain			
Yes	29(96.7)	30(100)	1*
No	1(3.3)	0(0)	
Sore throat			
Yes	3(10)	4(13.3)	0.706*
No	27(90)	26(86.7)	
Chest pain or pressure			
Yes	20(66.7)	23(76.7)	0.390**
No	10(33.3)	7(23.3)	
Asymptomatic			
Yes	0(0)	0(0)	-**
No	30(100)	30(100)	
Chest X-ray (Lobe involvement)			
1	10(33.3)	16(53.3)	0.118**
>1	20(66.7)	14(46.7)	

Fisher's Exact Test* Chi-2 Test**

Table 2. Comparison of the mean score of state anxiety, before and after training in control and experimental groups.

Group	Mean ± SD		Test statistics*	P-Value
	After	Before		
Control	67.63±3.29	71.60±3.88	-3.51	0.001<
Intervention	66.2±5.23	50.03±4.06	-4.71	0.001<
Test statistics	263.5	2		
P-Value	0.198	0.001<	....	

Wilcoxon Test * Mann-Whitney U Test **

Table 3. Comparison of the mean score of trait anxiety, before and after training in control and experimental groups.

Group	Mean ± SD		Mean ± SD	P-Value
	After	After		
Control	64±3.62	65.83±3.05	-2.2	0.028
Intervention	62.8±4.05	53.63±4.06	-4.63	0.001<
Test statistics	348.5	6.5		
P-Value	0.128	0.001<	....	

Paired T Test* **Independent T Test****

DISCUSSION

This present study aimed to determine the impact of the virtual training of Jacobson and Benson relaxation techniques on the anxiety of home-isolated COVID patients. The results of the study showed that before the relaxation intervention i.e., Jacobson and Benson techniques, the levels of implicit and explicit anxieties were high in both control and experimental groups.

A study by Rogers et al. showed that COVID-19 patients have symptoms such as high anxiety, delusion, and insomnia (18). High mortality, unknownness, no definitive treatment, and home isolation of patients with COVID-19, play a major role in the development of anxiety. Anxiety in COVID-19 patients can be relieved by performing Jacobson and Benson relaxation techniques, which are easy to learn and uncomplicated.

The results of our study also showed that after Jacobson and Benson relaxation intervention, the mean scores of implicit and explicit anxieties were significantly different in the experimental and control groups. In the experimental group, the score was lower compared to the control group. This means that with the training and

implementation of Jacobsen and Benson relaxation techniques, the level of anxiety in COVID-19 patients is reduced.

The results of the study by Akbari et al., which aimed to investigate the effect of relaxation on depression, anxiety, and stress in patients with multiple sclerosis, showed that relaxation techniques can reduce these psychological disorders and a combination of Jacobson and Benson relaxation techniques can be more effective in relaxing patients and reducing the number of relaxation sessions (19), which is also emphasized by Ghaffari et al. (20) and Soheili et al. (21). The results of the mentioned study are in line with those of the present paper. In the current study, due to the absence of direct contact with COVID-19 patients and the necessity of virtual training to prevent the transmission of the disease, using one relaxation technique could result in reduced impact. Therefore, a combination of Jacobson and Benson techniques was implemented for higher impact in the form of instructional videos and messages via WhatsApp, aiming to eliminate the gap between virtual education and the limitations caused by the patient's lack of access to a relaxation instructor. Thus, these two techniques were combined for COVID-19 patients for the first time.

The results of the study by Liu et al. under the title "Effects of Progressive Muscle Relaxation on Anxiety and Sleep Quality in Patients with COVID-19" showed a significant difference in the mean scores of anxiety and sleep quality in the experimental and control groups after the intervention (10). In 2020, Xiao et al. studied the effect of progressive muscle relaxation on negative emotions among COVID-19 patients. They reported the relaxation technique to be useful and found that progressive muscle relaxation reduces negative emotions among COVID-19 patients (22). In another study, Ozlu et al. investigated the effect of progressive muscle relaxation on anxiety and sleep quality in COVID-19 patients, finding a significant difference in the anxiety level of the experimental group

patients (23). The results of the mentioned studies are consistent with those of the present study. In our study, contrary to the above, a combination of two relaxation techniques i.e., Jacobson and Benson, was used, which can increase the impact of the intervention and make it more effective. Furthermore, due to the transmissibility of the disease and the necessary restrictions in visiting COVID-19 patients, the patients' training and the practice of relaxation were done virtually via WhatsApp, enabling the instructor to provide the necessary trainings at the scheduled time and date, to perform the related follow-ups without any limitations and to be accessible for clarifying ambiguities surrounding the practice of techniques, in case any questions were raised out of the scheduled sessions.

In a systematic meta-analysis review study, Manzoni et al. showed that relaxation training is constantly effective and should be used to reduce anxiety (24). Volpato et al. in a randomized controlled meta-analysis of 25 studies showed that progressive muscle relaxation is effective in reducing anxiety among patients with chronic obstructive pulmonary disease (COPD) (25). RahmaniBilondi et al. reported the impact of progressive muscle relaxation, using SMS service, on anxiety among pregnant women (26). Moreover, in the study by Devineni and Blanchard relaxation training via the Internet could reduce headache among subjects (27). Several studies have also reported the impact of the Jacobson relaxation technique on the level of anxiety among young women (28), among those at the early stages of breast cancer (29), and on prenatal anxiety (30), the results of which are in line with those of the current study.

Relaxation techniques can have important physiological and mental advantages for patients with acute and chronic diseases (10). This technique creates a balance between the posterior and anterior hypothalamus and prevents the adverse effects of stress and anxiety by reducing the sympathetic system's activity. This is an anti-stress, muscle relaxant technique, a tool to increase physical and ultimately, mental relaxation (31).

CONCLUSION

The present findings show that the implementation of Jacobson and Benson relaxation techniques significantly reduces anxiety in the experimental group compared to the control group. Considering the results of the present study and the aforementioned papers and their emphasis on the effectiveness of these techniques in many acute and chronic diseases, it is recommended to implement Jacobsen and Benson relaxation techniques, along with pharmacotherapy and other care and medications necessary for COVID-19 patients. Including these techniques in the patient's treatment protocol not only has no side effects and additional costs for the patient but also results in constant follow-ups and the cooperation of patients and their families to follow the physician's orders.

Conflict of Interest

The authors declare that there is no conflict of interest.

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