The Effect of Benson's Relaxation Technique on Occupational Stress Among Nurses Caring for Covid-19 Patients in Sabzevar, Iran

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Abstract

Background: Today, nurses face with caring for Covid-19 patients, consider as a new occupational stressor in the nursing profession.

Primary Study Objective: To investigate the effect of Benson's relaxation technique (BRT) on occupational stress of nurses exposed to Covid-19 patients.

Methods/Design: The present study is a two-group clinical trial with parallel design.

Setting: The samples were and randomly allocated into BRT and control groups based on the inclusion and exclusion criteria.

Participants: 70 nurses working in the intensive care unit (ICU) in the Covid-19 treatment center in Sabzevar, Iran

Intervention: Intervention group were performed the BRT exercises twice a day for 1 month during 20 minutes each time. The data was collection through Osipow Occupational Stress Questionnaire.

Primary Outcome Measures: Occupational stress

Results: The mean occupational stress score in the BRT group immediately and after 1 week of intervention, was significantly lower than the control group ($P = 0.001$). The repeated measure analysis of variances test showed a significant difference in the mean occupational stress score in the 6 subscales after the intervention between the two groups ($P < 0.05$).

Conclusion: This study showed BRT reduces occupational stress among nurses working in the ICU, caring for Covid-19 patients.

Trial registration: IRCT, IRCT20131113015393N6. Registered 30 March 2020, <https://en.irct.ir/trial/46609>

Introduction

In the healthcare system, nurses play an important role in improving health care. most of health care personnel are nurses.(1) Nurses are under a lot of stress due to stressful work environments, which can lead to many physical and mental disorders (2). Stress and pressure can have a negative effect on their mood and quality of work life, causing them to become somewhat discouraged and depressed (3). On the other hand, the health and peace of mind of the people working in this profession can have a great impact on their performance and quality of working life, and of course, the health of people in the community (2). Working in intensive care units (ICU) is one of the causes of stress, which due to the hospitalization of patients with acute and malignant diseases and complex equipment, they need experienced and practiced nurses, who are able to deal with stress and perform various nursing processes continuously and in emergencies (4).

One of the most important issues facing nurses today, especially nurses in the ICU, is the exposure to a contagious disease called coronavirus (COVID-19), which, in addition to other occupational stressors in the nursing profession, the nature of the disease, including the rapid spread of the virus, the significant number of patients with the virus at any time, rapid and unpredictable changes in patients, lack of appropriate response to treatment, Lack of adequate equipment or defects during work and dealing with dying patients have made this group of nurses at more risk than other nursing groups (5). These factors can reduce the quality of care for these patients, the inability to make the right decisions in a timely manner, decrease of skill, job dissatisfaction, depression, feelings of inadequacy, decreased job values, disgust, fatigue, Absence and delay at work, sick leave, and increased error (6, 7).

Strategies for treating stress in the workplace include improving behavior, controlling the organizational atmosphere, providing social support, and physical-mental strategies to achieve relaxation (physical and mental relaxation) (3).

Relaxation is a well-known and old-fashioned method in medicine, clinical psychology, and psychoanalysis that has gained special importance in recent decades. Commonly used relaxation techniques include progressive muscle relaxation, mental image relaxation, Benson relaxation technique, deep relaxation (deep breathing), selective relaxation, self-creation method, meditation (8, 9). Among the methods mentioned, the method introduced by Dr. Herbert Benson in 1970 is more desirable because it is easy to learn and teach to others (10). Benson saw coping with stress and de-stressing as key to meditation. Therefore, in his study, he introduced four elements of calm environment, comfortable state, mental means (the word that is focused on it) and passive attitude as important and basic elements in reducing stress (10).

Benson's relaxation technique (BRT) by increasing the concentration of the senses improves a wide range of physical and psychological signs, symptoms of pre-stress, anxiety, depression, mood and self-confidence. Benson relaxation also reduces the activity of the sympathetic system and the secretion of catecholamines by creating a balance between the anterior and posterior hypothalamus, causing muscle relaxation and reducing stress in the individual (11).

Given that nurses' occupational stress can seriously impair their professional performance, quality of life, and other roles, it can also reduce the quality of nursing services, interventions aimed at reducing occupational stress and improving the quality of their working life seem necessary. Based on the fact that so far no study has been found on the effect of BRT on nurses' occupational stress, and on the other hand, the simplicity and low cost of this technique and the lack of significant side effects; this study was aimed to determine the effect of Benson's relaxation technique on occupational stress among nurses working in the intensive care unit exposed to Covid-19 patients.

Method

The present study is a two-group clinical trial with parallel design in which the study population consisted of 70 nurses working in the ICU at the Sabzevar Vasei Hospital (Corona Treatment Center) in the peak of

epidemic date in 2020, March.

Participants

The study population included nurses working in the ICU of Vasei Hospital. The samples were selected according to the inclusion and exclusion criteria and randomly allocated into two groups: Benson relaxation and control. Criteria for entering the study included: consent to participate in the study, having at least a master's degree in nursing, having at least 6 months of working experience in the intensive care unit, caring for covid-19 patients at least 1 month, inexperience and unfamiliarity with similar courses of muscle relaxation, Lack of known mental illness, lack of stress medication and lack of the occurrence of stressful events lately. The study exclusion criteria were unwillingness to continue, BRT performing less than 10 sessions per week based on self-report checklist.

Intervention

Eligible individuals were divided into two groups: Benson's relaxation technique and control. The data collection tools in this study included the Demographic Information Questionnaire and the Osipow Occupational Stress Questionnaire. In the Demographic Information Questionnaire, respondents' personal and demographic characteristics including age, gender, level of education, work experience and working shifts were questioned. After obtaining the necessary licenses to conduct research, the researcher used cyberspace and social media (WhatsApp, etc.) to make a group of nurses working in ICU of Vasei hospital, and after stating the goals and obtaining an informed consent virtually from the nurses they randomly allocated into the intervention and control group.

Before the intervention, the demographic questionnaire and the Osipow questionnaire were filled out online, and then a nurse with training skills and working in the ICU department was used to perform the relaxation procedure, in such a way that, first during a two-hour session with the researcher, the steps and how to do the technique were determined, and after making sure that the Benson relaxation technique was performed correctly, the nurse was asked to teach the relaxation technique to the researcher according to the instructions. Allocation randomization determined the BRT and control group, and then by cooperation of head nurse the intervention group was planned in the morning and control group in the evening working shifts. First BRT therapy was done by the leadership of trained nurse in the ICU, at the end of the shift before going home and the second intervention was done individually by participants at the rest of the day. The investigation officially began in late March 2020. In addition, audio and video files were placed on the WhatsApp group for further use. Also, the nurses were followed up by telephone in order to perform the techniques and their ambiguities were eliminated through telephone conversations and private chats. In the designed questionnaire, a section was considered that by selecting that option, they would be free to leave the study.

The content of the audio file for Benson's relaxation was such that the person was asked to get rid of annoying thoughts and choose a soothing word (such as God, life, love, rain) that always reminded her of peace, and begin to take deep, regular breaths (inhale through the nose and exhale through the mouth)

and repeat the desired soothing word. At the same time, the participant was asked to relax her muscles from the tips of her toes to the top of her body so that all the muscles of the body would reach full relaxation, and to do this for 15-20 minutes. During this procedure, the person carefully performs the steps with the help of the audio file. The 20-minute instruction audio file was set. After training sessions and ensuring that participants learn, they should do this exercise twice a day for one month and 20 minutes each time. Nurses were checked the self-report checklist every day after the BRT therapy to mean that the intervention was completed that day. The control group did not receive relaxation method. Immediately after the training and a month after the training, BRT questionnaire was re-completed online. In order to observe the ethical principles at the end of the research, the control group was given the method of performing the relaxation technique along with the video file and the audio file.

Outcome - Assessment

The Osipow Occupational Stress Questionnaire is ranked 1 to 5 based on a five-point Likert scale. This questionnaire is arranged in six dimension of occupational stress and each dimension includes 10 questions. The first dimension is occupational role (lack of necessary support in the aggravation of occupational responsibilities) is related to how the person responds to the demand of the work environment. The second dimension is inadequate role (including contradiction between skills and what the job expects from the individual) is related to the coordination between skill level, education, and experiential and educational characteristics of the individual with the needs of the work environment. Third dimension, role of duality (ambiguity in the tasks that are expected of a person and how to evaluate it) is related to individual awareness of the priorities and expectations of the work environment and evaluation criteria. Fourth dimension, the role of scope (feeling doubt and hesitation in expressing the demands and not being clear about the limits of authority) is related to the person's contradictions in terms of work conscientiousness and the role that is expected of her. The fifth dimension, responsibility (feeling the pressure of working with colleagues who are problematic) is related to a person's sense of responsibility for the efficiency and well-being of others in the workplace. The sixth dimension, physical environment (noise, humidity, circulation, dust, heat, heat, etc.) is related to the unfavorable conditions of the physical environment to which the person is exposed. The scores are determined by the Osipow questionnaire and based on that, it is determined in each area that the person has levels of occupational stress, and in this scale, four levels (less than normal, normal stress, moderate stress and severe stress) have been identified. In this study, a person who has moderate to severe stress levels is considered as a person with stress.

Scoring

The scoring method of the Osipow Occupational Stress Questionnaire is based on a 5-point Likert scale: For each phrase, 5 options are considered, Never equal to 1 point, sometimes = 2, often = 3, usually = 4, and most of the time equal to 5 points. The range of scores of this questionnaire varies between 60 and 300, and the higher scores of the subject in this questionnaire indicate the higher level of her/his stress.

Also, the overall stress is categorized in four levels based on mean scores in the form of low stress (between 50 and 99), mild stress (100 to 149), moderate stress (150 to 199) and severe stress (200 to 250). The Osipow Standard Occupational Stress Questionnaire was first used by Osipow et al. (1987) (12) and it has been repeatedly used by various researchers in Iran (13) and its reliability has been confirmed by the Cronbach's alpha test ($\alpha=0.92$).

Ethical considerations

This study was reviewed in the ethics committee of Sabzevar University of Medical Sciences and was approved with the code IR.MEDSAB.REC.1397.063. The study was recorded in the Iranian Registry of Clinical Trials with the code IRCT20131113015393N4. At all stages of data collection, the profile of nurses was preserved as confidential and unnamed. Each person's identity was identified by an ID.

Sample size

The sample size was calculated on basis of a pilot study on 20 nurses and the highest estimate of the number of samples obtained was considered. The effect size of this study was used to estimate the required sample size of 0.80 (large difference between two means). Thus, the minimum sample size with 95% confidence level and 90% test power was calculated to be 62 people. Due to the probability of sample fall, about 10% was added to the above volume and the final sample size was 35 people in each group and 70 people in total. At the end, 37 people in the intervention group and 33 nurses in the control group (a total of 70 people) participated in the study (Flow diagram 1).

Blinding

Eligible nurses were randomly allocated into BRT and control groups. Allocation using random 6-person blocks was performed by a statistical consultant, and nurses (flow diagram 1) were randomly assigned to each group in a 1: 1 ratio. In this double blinded study, the research assistant who collected the data was unaware of the study protocol (assigning code A and B to the intervention and control group in the online questionnaire). Analyst statistician also performed the results based on the codes and without knowing the grouping.

Statistical analysis

Quantitative and qualitative variables were presented as mean, standard deviation and frequency (%), respectively. After checking that the variables are normal using Kolmogorov-Smirnov test (K-S test), the mean occupational stress was used in two groups with RM-ANOVA (repeated measure analysis of variances test). Data were analyzed with SPSS software version 16. The type I error for statistical tests was considered 0.05.

Findings

The study found that participants had an average age of 33.5 ± 5.6 years. 72% women and 38% men participated in the study (Table 1). The results showed that there was no significant difference between demographic characteristics ($p > 0.05$).

Table 1
Comparison of demographic characteristics between BRT therapy and control groups

Parameters			Group			
			N	BRT*	N	Control
Age, year		(Mean ± SD)	37	34.6 ± 6.8	33	32.4 ± 4.5
Time of employment, year			37	8.6 ± 4.2	33	11 ± 3.29
Gender	Female	N (%)	37	15 (40.5)	33	13 (39.3)
	male		37	22 (59.4)	33	20 (60.6)
Educational degree	Bachelor		37	11 (29.7)	33	7 (21.2)
	Master and more		37	26 (70.2)	33	26 (78.7)
Working shifts	Fixed		37	7 (18.9)	33	10 (30.3)
	Rotating		37	30 (81.8)	33	23 (69.6)
*Benson relaxation technique						

The results of One-way ANOVA test at baseline revealed that the mean occupational stress score before the intervention was not significantly different between the BRT and control groups ($p = 0.15$). While the RM-ANOVA between subject effect and comparison of the mean occupational stress score between the two groups, immediately and after 1 week of intervention in the BRT group, was significantly lower than the control group ($p < 0.001$) (Table 2).

The results of tests of within subject effect and Greenhouse-Geisser coefficient showed that the mean score of occupational stress before the intervention immediately and 1 week after the intervention in the BRT group was significantly different through the time, ($p = 0.001$). The results of the post-hoc Tukey's post-hoc test showed the mean score of occupational stress immediately after the intervention and 1 week after the intervention in the BRT therapy group had a significant difference with those of the control group ($p = 0.001$). However, this difference was not significant in the control group ($p = 0.080$) (Table 2).

Table 2
Comparison of mean scores of occupational stress in the experimental and control groups

Groups	Before intervention	Immediately after intervention	1 week after intervention	Within subject effects (time)*		
	Mean $\pm$ SD			F	df	p
BRT**	216.1 $\pm$ 13.3	136.6 $\pm$ 15.4	140.3 $\pm$ 14.2	69.2	1	0.001
Control	213 $\pm$ 15.4	220.5 $\pm$ 18.7	224.2 $\pm$ 14.5	0.54	1	0.080
Between subject effects (group)*						
F	132.4					
df	1					
P	0.001					
*Repeated measures analysis of variances						
**Benson relaxation technique						

Figure 2 shows the trend of changes in the mean score of nurses' occupational stress in the two groups before and after the intervention, the downward trend of the mean scores in the intervention group after relaxation exercises compared to the control group is observable.

Table 3 reveals the comparison of the mean score of 6 subscales of the occupational stress between the two groups. The One-way ANOVA did not reveal a significant difference in the mean occupational stress score in the 6 subscales before the intervention between the two groups under study ($p > 0.05$). However, the mean of these scores using RM-ANOVA was significantly lower immediately and 1 week after the intervention compared to the control group ($p < 0.05$).

Table 3

Comparison of mean scores of subscales of occupational stress in the BRT and control groups

Occupational stress factors	Groups	Before intervention	Immediately after intervention	1 week after intervention	Between subject effects (group)*
		Mean ± SD			p-value
Role Overload	BRT**	48.4 ± 2.2	22.8 ± 4.3	25.2 ± 2.5	0.001
	Control	45.3 ± 3.6	45.3 ± 5.1	47.8 ± 4.2	
Role Insufficiency	BRT	28.5 ± 2.3	21.3 ± 2.5	25.3 ± 2.5	0.011
	Control	29.3 ± 4.5	32.7 ± 3.6	33.7 ± 4.1	
Role Ambiguity	BRT	25.3 ± 4.1	18.3 ± 2.5	18.1 ± 5.4	0.025
	Control	22.6 ± 3.4	25.6 ± 3.6	28.3 ± 2.2	
Role Boundary	BRT	27.3 ± 6.1	23.0 ± 5.2	22.0 ± 6.4	0.001
	Control	28.4 ± 5.4	29.9 ± 7.3	28.0 ± 5.5	
Responsibility	BRT	40.6 ± 4.7	29.2 ± 5.1	32.3 ± 4.6	0.001
	Control	41.0 ± 5.3	37.8 ± 5.9	39.6 ± 6.5	
Physical Environment	BRT	42.1 ± 3.5	22.2 ± 4.5	26.1 ± 2.6	0.001
	Control	44.0 ± 3.2	47.3 ± 4.1	48.9 ± 3.3	
*Repeated measures analysis of variances					
**Benson relaxation technique					

Discussion

The occupational stress is one of the significant issues in the nursing profession. According to literatures, the suicide rate in medical staff has increased in recent years which occupational stress may be a risk factor (14). The present study aimed the effect of Benson's relaxation Technique on occupational stress among nurses caring for Covid-19 patients.

The results of the present study showed that the mean score of nurses' occupational stress in the caring of Covid-19 patients in the intervention group after Benson relaxation exercises decreased immediately and 1 week after intervention compared to the control group. In other words, BRT not only reduces occupational stress among nurses working in the intensive care unit exposing corona virus, but also its effectiveness was sustained up to 1 week after the intervention.

Findings related to the mean scores before the intervention in both groups are very notable that we see the highest level of stress (> 200) among nurses with an mean score (> 210), These scores are seen in

fewer studies that have looked at the level of occupational stress among nurses.

Obviously working in the high-risk and critically ill patients, working in the ICU, job stresses such as high workload, stress caused by the risk of infection and many other factors have caused this level of stress among nurses in our study that complications and consequences of occupational stress can threaten their lives. Nurses who died during the outbreak of the Covid-19 virus may have died from fatigue and stress at work (15) or may experience complications such as post-traumatic stress disorder (16). Performing relaxation techniques reduces the level of anxiety among nurses after the intervention.

In the present study, nurses had the highest level of occupational stress at the outbreak time of coronavirus and the high admission of affected patients. Before the intervention participants in both groups reported severe occupational stress. This level of stress modified to medium form in the immediately and 1 week after intervention in BRT group, While the stress level was remained in the severe form in the control group. Study of Madadzadeh et al. (2016) (13) on the job stress level of nurses in Vasei Hospital (the same place in the current study) revealed 83.8% of nurses had a workload and 20% of those had a high level of occupational stress. Their study belongs prior of Covid-19 pandemic. The difference between the findings these similar studies indicates the high effect of Covid-19 pandemic on the occupational stress among nurses. In this regard, Fernandez (2020) (17) in a review study concluded the level of anxiety and stress of nurses in the face of coronavirus is significant and impressive.

Another finding of the present study was the changes in occupational stress over time in both intervention and control groups. In other words, over time, the level of occupational stress among nurses in the control group has been on the rise, which can be justified by the constant confrontation with Covid19 patients and work related fatigue however in the BRT group, because of Benson's relaxation exercises it has been reduced even a week after the intervention.

Investigation of occupational stress subscales in the two study groups revealed the workload that could be due to factors such as lack of manpower, increased referrals, and special care for Covid-19 patients was the highest occupational stressor and then the physical environment that could result from factors such as environmental pollution and equipment shortages; was an important occupational stressors among nurses in both groups. From Ozcan's point of view (18), workload and increasing patient mortality are dangerous stressors for nurses. As Xu et al.'s (2019) (19) study shows, workload is the most important factor in the occurrence or exacerbation of occupational stress in nurses. This crisis is led to sick leave of many nurses and making overtime to their colleagues. Bautista et al. (2019) (20) also identify overtime as the most important occupational stressor for nurses, which is associated with fatigue and decreased satisfaction.

As an emergency pandemic in public health, Covid-19 is associated with significant mortality and social and economic disruption. Nurses play a key role in combating this crisis. Providing direct patient care, risk of infection (17), hospital admission capacity, inadequate staff equipment (21), are some factors that increase the significant short-term and long-term consequences (15). Although the focus of the health system is on prevention of outbreaks and treatment of the disease at the public and health centers, the

effects of the disease on people's mental health should not be overlooked. Fear, anxiety, stress, fatigue, depression and even suicide are some of the consequences of this epidemic that threatens nurses who are at the forefront of treatment. Adams (22) emphasizes the importance of caring for treatment staff in the face of Covid-19, which is currently considered a pandemic challenge in physical and mental health. Relaxing interventions such as Benson, which do not require special training and with no cost for health care systems, can be considered an effective way in reducing nurses' occupational stress and its associated side effects.

This study was performed on nurses faced with Corona virus. One major limitation of this study according to the leader nurse statements was difficulty in the concentration and taking focus of participants in the beginning of each session because of having high stress, this was reduced through the further exercises.

The results of this study can be used in care systems to reduce occupational stress, improving the quality of care services to patients and their satisfaction, increasing the quality of life of nurses. Future research on BRT is recommended on other aspects, such as the quality of life of nurses in the face of a variety of high-risk diseases such as corona virus.

Conclusion

Findings from the present study revealed performing Benson relaxation techniques reduces occupational stress among nurses working in the ICU, caring for patients with coronavirus.

Abbreviations

COVID-19: Coronavirus Disease 2019

ICU: intensive care unit

BRT: Benson's Relaxation Technique

K-S: Kolmogorov-Smirnov

RM-ANOVA: Repeated measures analysis of variances

Declarations

Ethics approval and consent to participate

This study was reviewed in the ethics committee of Sabzevar University of Medical Sciences and was approved with the code IR.MEDSAB.REC.1397.063. The study was recorded in the Iranian Registry of Clinical Trials with the code IRCT20131113015393N4. All participants signed consent form and consented to their data publication.

Availability of data and materials

All data in the present study are included.

Competing interests

There is no conflict of interest between the authors in this study.

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Authors' Contributions

All authors have contributed significantly. F.B, conducting the study, contributed in the analysis and interpretation of the data, revising the draft, A.D. contributed to the data collection, writing first draft, Z.M, contributed to translation and revising the draft, Drafting the work, S.R, contributed in the analysis of the data, revising the draft, M.H. contributed to revising the draft. N.H, contributed in the data collection of data, Drafting the work and revising it critically for important intellectual content. All authors approval of the final version of the manuscript, and agreed for all aspects of the work. Correspondent Author is Narjes Heshmatifar

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Figures

Figure 1

Figure 2
mean occupational stress before and after of intervention in BRT and control groups I, before intervention II, immediately after intervention III, 1 week after intervention