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A Pilot Testing of the Effect of Guided Meditation on Anxiety, Depression and Sleep Quality among COVID-19 Patients Admitted in a Tertiary Care Facility

Devanshi Chowdhary[1], Suman Dabas[2*], Vanita[1], Poonam Joshi[2] and Anjan Trikha[3]

[1]AIIMS, New Delhi, India.
[2]College of Nursing, AIIMS Delhi, India.
[3]Department of Anaesthesiology, AIIMS, Delhi, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Hospitalization of COVID- 19 patients may lead to the development of varied levels of anxiety, depression, and sleep disturbances. The present study was conceptualized to investigate the effect of guided meditation on anxiety, depression, and sleep quality among the hospitalized Covid-19 patients in a tertiary care facility.

Materials and Methods: A total of 60 COVID-19 patients were conveniently enrolled and randomized to experimental (30) and control arms (30) using a computer-generated random table and opaque sealed envelope technique in a selected COVID unit of a tertiary care facility. The subjects were enrolled in accordance to the inclusion criteria.

Intervention: The guided meditation was an audio recording of Sri Sri Ravi Shankar of 20 minutes

**Corresponding author: E-mail: sumandabas1987@gmail.com;*

duration. The intervention was provided twice a day to the experimental group for consecutive 5 days. A close watch was kept on the vital signs of the subjects during the intervention using a pulse oximeter. At the same time, the control group continued to receive the standard routine care.
Results: There was a significant difference observed in the post-test anxiety and depression scores in the experiment and control groups (4.83±3.68 vs. 12.37±3.9 p=0.001 and 7.90±2.41 vs.12.67±2.65 p=0.001). A significant difference was also observed in the global sleep quality index (median (IQR)) in the experimental and control groups (11(9-14) vs. 15(10.75-17) p= 0.01).
Conclusion: The guided meditation was effective in improving the global sleep quality index and alleviating the anxiety and depression to great extent as compared to the standard routine care provided to COVID-19 patients admitted in a tertiary care facility.

Keywords: COVID-19 patients; anxiety; depression; quality of sleep.

1. INTRODUCTION

Corona virus disease 2019 (COVID-19) caused by a novel corona virus (severe acute respiratory syndrome corona virus 2 (SARS-CoV-2)) is a highly infectious pandemic disease affecting a large number of the population over the world [1]. The common symptoms of the disease include fever, cough, fatigue, and shortness of breath [2]. A significant number of patients (5-6%) become critically ill requiring intensive nursing care in a COVID intensive care unit and a large number of patients with fluctuating levels of oxygen saturation and mild to moderate symptoms of viral pneumonia may require observation in a COVID unit. These patients may progress to acute respiratory distress syndrome (ARDS), septic shock, multi-organ failure, and hyper-coagulable disorders, etc., if not timely monitored and treated [3,4].

The prevalence of anxiety, depression-related symptoms in confirmed or suspected COVID-19 has been reported [5]. Due to the infectious nature of the disease, COVID-19 patients are admitted to the isolation rooms of the COVID unit of the hospital. The patients are not allowed to have any direct interaction with their family members till the time of their complete recovery followed by home isolation for 14 days. The direct face-to-face interaction of COVID-19 patients with the health care professionals is also restricted due to the infectious nature of the disease. During hospitalization and thereafter the home isolation may lead to the development of varied levels of anxiety, depression, and sleep disturbances. COVID-19 with itself brings a piece of additional baggage of anxiety, depression and insomnia related to prolonged treatment, loneliness, social stigma, rendering them sleepless nights [6]. The anxiety aggravates the present health condition and psychological stress. Some studies have reported of COVID-19 pandemic triggering anxiety depression as well as psychological disturbances related to the worries of COVID-19 [7] and may cause major impact on the physical and psychological health [8] and thus coping strategies are needed to decrease anxiety and stress in COVID- 19 pandemic [9]. A moderate use of copying strategies like seeking social support, acceptance, mental disengagement, and humanitarian has been used during COVID 19. It is important to identify appropriate strategies that could help to not only cope with adverse effects of the current pandemics but that can also enhance resilience to similar disasters in the future [10]. Such a major pandemic is known to have caused major circadian rhythm and sleep disturbances as well [5].

Mind-body interventions, the most frequently used complementary alternative medicine (CAM) haves shown to have a positive impact on sleep and sleep patterns.[11] Various therapies like meditation, guided imagery, hypnotherapy, mind-body movement, biofeedback, relaxation technique have shown positive impacts on sleep [11]. Meditation is a relaxation technique that has both short-term and long-term benefits on the body and the brain. Several studies have shown to have beneficial effects against an array of physical and mental conditions such as irritable bowel syndrome, fibromyalgia, psoriasis, anxiety, depression, and post-traumatic stress disorders. It has also helped the individuals in smoking cessation, increasing their cognitive skills, and concentration and produced a calming effect on the body, thereby improving the quality of sleep [12]. The guided meditation a relatively safe and cost-effective strategy has been used effectively in people suffering from insomnia, stress and anxiety, depression, and insomnia [13]. The COVID-19 patients have significant anxiety, depression and sleep problems due to the evolving nature of disease, unpredictable outcome and separation from their family members and limited interactions with the HCP

[14]. We hypothesized that there would be a significant difference in mean anxiety, depression, and sleep quality following a guided meditation intervention provided to COVID-19 patients. Therefore the present study was conceptualized to investigate the effect of guided meditation on anxiety, depression, sleep quality, and coping methods among the hospitalized Covid-19 patients in a tertiary care facility [15].

2. MATERIALS AND METHODS

2.1 Design and Participation

In a randomized controlled trial using a quantitative approach, 60 COVID-19 patients were conveniently enrolled and randomized to experimental (30) and control arms (30) using a computer-generated random table and opaque sealed envelope technique in a selected COVID unit of a tertiary care facility. The trial was registered for **CTRI (CTRI/2021/05/033303).** All COVID-19 patients, hemodynamically stable, willing to participate, having mobile phone and earphone in the hospital, and having a history of hospitalization for minimum 5 days. The COVID-19 patients with a diagnosed history of psychiatric disease, having confusion or delirium were excluded.

2.2 Hospital Anxiety and Depression Scale (HADS) and modified Pittsburgh Sleep Quality Index (m-PSQI)

The HADS scale was used to assess the anxiety and depression and m-PSQI to assess the sleep state of COVID-19 patients. The HADS scale had 21 items on 4 points Likert scale (0- never, 1 some times, 2- and 3 most of the time);the anxiety and depression scores were graded as normal (0-7), borderline abnormal (8-10) and abnormal (11-21) [14]. Modified Pittsburgh Sleep Quality Index had a total of 19 self-rated questions which were combined to form seven component scores each of which had a range of 0-3 points. In all cases, a score of "0" indicated no difficulty, while a score of "3" indicated severe difficulty related to sleep during COVID-19 infection [15]. The seven components were subjective sleep quality, sleep latency, and sleep duration, habitual sleep efficiency, sleep disturbance, use of sleep medication, daytime sleep dysfunction. Both the tools were standardized tools and permission was sought before use. The tools were translated in Hindi and back-translated in English to ensure the meaning. The tools were pretested and validated and tried out before the final data collection.

2.3 Data Collection

The baseline data (27 items) was collected using a pretested and validated demographic profile containing information related to age, gender, area of residence, education, type of family, number of family members, occupation, total family income, and clinical profile of COVID-19 patients. All recommended precautions were observed by the researchers during the data collection.

2.4 Intervention

The guided meditation was an audio recording of Sri Sri Ravi Shankar of 20 min duration, available to the public domain.Permission to use the audio for research purpose was obtained.The subjects were instructed to use the washroom before the intervention and wear loose clothes. The audio contained an instruction to relax body parts with soothing background music, which was played through an earphone to the patients of the experimental group. The intervention was provided twice a day; after lunch around 2 pm and at bedtime for consecutive 5 days. A close watch was kept on the vital signs of the subjects during the intervention using a pulse oximeter. Any subject who complained of uneasiness or deterioration during the intervention was considered as a dropout. At the same time, the control group continued to receive the standard routine care.

2.5 Data Collection

The baseline data (27 items) was collected using a pretested and validated demographic profile containing information related to age, gender, area of residence, education, type of family, number of family members, occupation, total family income, and clinical profile of COVID-19 patients. All recommended precautions were observed by the researchers during the data collection.

2.6 Statistical Analysis

Data analysis was done using SPSS 22.0 software. Mean, SD, Median IQR, frequency percentage were computed as part of descriptive analysis. The groups were compared using the chi-square test, fisher's exact test and one-way ANOVA test. The comparison within and between the groups was done using paired "t" test and independent "t" testfor continuous normally distributed data respectivelyand nonparametric Man-Whitney U test and

Wilcoxon Sign Rank tests for ordinal data. The set level of significance was at p <0.05.

3. RESULTS

The demographic profile of the patient with COVID-19 in experimental and control groups was comparable in terms of their age, education, occupation, type of family and monthly income, and associated co-morbidities and vital signs at admission. (Table 1). Pre-intervention mean anxiety and depression scores in both the groups were comparable (9.10±4.68 vs. 10.53±4.78 p=0.516and 10.40±2.91vs. 10.87±2.75 p=0.476) (Table 4).

After 10 sessions of guided meditation over 5 days, there was a significant difference observedin the mean anxiety(9.10± 4.68 vs. 4.83±3.68 p =0.062) and depression scores (10.4 ± 2.91 vs.7.90±2.41, p = 0.001)in COVID-19 patients of the experimental group, while in the control group, post-test anxiety and depression scores were 12.37±3.9 and 12.67±2.65 respectively. There was a significant difference observed in the post-test anxiety and depression scores of the experimental and control group (4.83±3.68 vs. 12.37±3.9 p=0.001 and 7.90±2.41 vs.12.67±2.65 p=0.001) (Table 3).

After 5 day, the mean temperature, heart rate, respiratory rate and SpO_2 were stabilized in both the groups.(98.48±1.5 vs. 98.48±1.4, p=0.047), (85.23±8.7 vs.87.27±12.8, p=0.025), (24.9 ± 6.4 vs. 24.6 ±7.1, p=0.44) (95.23±3.1vs.96.1±2.5, p=0.14). There was no significant difference observed in temperature, heart rate, blood pressure, SPO_2, and voiding status while a significant difference was observed in respiratory status and feeding status of patients in the experimental and control groups. (Table 2).

Sleep quality in terms of subjective quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, and daytime dysfunction in both experimental and control groups were comparable at baseline. There was a significant difference in sleep duration scores (median (IQR)) [6.0(4-7) vs. 3.5 (2.5-5), p=0.001) in experimental and control groups. There was a significant difference observed in median scores of subjective sleep quality (1(1-2) vs. 3(2-3) p=0.001), Sleep latency (1(1-3) vs. 3(1-3) p=0.047), Sleep duration (1(1-2) vs. 3(2-3) p=0.001), Habitual sleep efficiency (0(0-1) vs. 3(1-3) p=0.001) and Sleep disturbance (1(0-1) vs. 3(2-3) p=0.001) in experimental vs. control group respectively. However, no significant difference was observed in daytime dysfunction median (IQR) scores [(1(1-2) vs. 2(1-2) p =0.119)] in the experimental and control groups. None of the patients in eithergroups were prescribed sleeping medications (Table 4). None of the subject in the experimental group reported any undesirable side effects or unintended harmful signs, symptoms, or disease related to participation in the study or the guided meditation technique.

4. DISCUSSION

The purpose of this study was to investigate the effects of guided meditation on anxiety, depression and sleep quality in patients with COVID-19. Hospitalization can lead to anxiety and depressive symptoms in patients, results of present study are in line with other studies [7].

Major findings of the study reveal that there was significant reduction in anxiety, depression scores and improvement in sleep quality among patients with COVID-19. The results of studies on the effects of progressive muscle relaxation on anxiety level and sleep quality among COVID-19 patients were consistent with the present study [16]. Other studies in which effect of mind body intervention was observed in cancer patient, relaxation technique on anxiety level in young women, prenatal and postnatal anxiety and early breast cancer are consistent with this study [17- 20]. The present study finding are in lieu to a systematic review regarding the effect of mindfulness meditation on sleep which concluded that there was strong evidence that mindfulness meditation interventions significantly improved sleep quality [21]. In another systematic review mindfulness meditation was found effective in improving daytime impairment and sleep quality among older adults with sleep disturbances [22].

Guided meditation was also found effective in improving sleep quality index in patients with covid-19. Previous studies have shown that guided meditation reduce complication and improve sleep quality of patients with fractures [23] and another study also showed that relaxation technique can reduce fatigue and improve sleep quality in patients with COPD. The reason for the decrease in anxiety of patients after guided meditation training may be attributed to the balance between the anterior and hypothalamic nucleus, which reduces the activity of the sympathetic nervous system and prevents side effects of stress and anxiety and lead to physical and mental relaxation [24].

Table 1. Socio-demographic and clinical characteristics of COVID patients at admission

Variable(s)		Experimental group n= 30	Control group n= 30	p value[b]
		Frequency (%)	Frequency (%)	
Age[a]		40.6±15.5	45.6±14.1	0.17
Gender	Male	22	14	0.035
	Female	8	16	
Education qualification	Illiterate	2	4	0.075
	Primary	5	3	
	Secondary	5	5	
	Senior Secondary	8	11	
	Graduate and above	10	7	
Occupation	Government Job	7	4	0.14
	Private Job	10	6	
	Daily wages	4	2	
	Unemployed	9	18	
Type of family	Joint	14	15	0.59
	Nuclear	16	15	
Residential area	Rural	7	7	1.0
	Urban	23	23	
Monthly family income (Rs)	<20,000	12	4	0.08
	20,001-40,000	7	13	
	40,001-60,000	7	6	
	>60,000	4	7	
Co-morbidities	No	12	6	0.079
	Yes	18	24	
	Hypertension	6	8	
	Renal	7	0	
	Cardiovascular	1	4	
	Any other	6	8	
Clinical Profile (at admission)				
Temperature (^{o} F)		100.11± 1.72	99.47± 1.35	0.119
Heart Rate (beats/ min)		96.73± 16.2	97.0± 15.8	0.95
Blood pressure	0	15	13	0.280
	1	7	3	
	2	4	4	
	3	4	8	
	4	0	2	
Respiration Rate (breaths/ min)		27.5 ± 6.7	24.4± 7.5	0.99
O_2 Saturation (SPO_2)		93.57± 4.25	92.8± 4.59	0.51
Respiratory status	Room Air	21	16	0.485
	O2 < 3 l/min	2	6	
	O2 > 3l/min	5	4	
	H3FNC	1	2	
	Rebreather mask	1	2	
Feeding status	Oral	28	26	0.238
	Partial feed	1	0	
	Intra-venous	1	4	
Voiding status	Self	27	28	0.601
	Diaper	1	0	
	Foley's catheter	2	2	

*[a]Independent t test, [b] Fisher's Exact test, *p<0.05*

Table 2. Clinical profile of COVID patients before and after the intervention

Variable			Experimental Group (30)	Control Group (30)	p-value (between groups), post intervention
Temperature (^{o}F)	Before intervention		98.49±1.49	99.4±1.3	
	After intervention		98.03± 0.84	98.48±1.4	0.047
	p-value (within group)		0.074	0.006	
Heart Rate (beats/ min)	Before intervention		85.23±8.7	87.27±12.8	
	After intervention		85.07± 6.65	84.60± 11.65	
	p-value (within group)		0.001	0.001	0.025
Respiration Rate (breaths/ min)	Before intervention		27.5± 6.7	24.67 ± 7.13	
	After intervention		24.9 ± 6.4	22.30 ±7.91	
	p-value (within group)		0.001	0.001	0.44
Blood pressure	Before intervention	<120/<80	18	14	
		120-129/<80	4	1	
		130-139/80-89	2	6	
		>140/>90	5	8	0.222
		>180/>120	1	1	
	After intervention	<120/<80	18	14	
		120-129/<80	3	2	
		130-139/80-89	4	6	
		>140/>90	5	7	
		>180/>120	-	1	
	p-value (within group)		0.655	0.157	
O_2 Saturation (SPO_2)	Before intervention		95.23 ±3.10	96.13± 2.56	0.121
	After intervention		96.43 ± 2.67	95.47± 3.23	
	p-value (within group)		0.512	0.00	
Respiratory status @	Before intervention	Room air	10	11	
		O2 < 3 l/min	13	9	0.007
		O2 > 3l/min	4	6	
		H3FNC	2	4	
		Rebreather mask	1	-	
	After intervention	Room air	18	13	
		O2 < 3 l/min	3	8	

		O2 > 3l/min	4	4	
		H3FNC	5	4	
		Rebreather mask	-	1	
	p-value (within the group)		0.001	0.705	
Feeding status	Before intervention	Oral	30	20	0.040
		Naso-gastric feed	-	6	
		Partial feed	-	1	
		Intra-venous	-	3	
	After intervention	Oral	30	26	
		Naso-gastric feed	-	-	
		Partial feed	-	1	
		Intra-venous	-	3	
	p-value (within the group)		1.00	0.854	
Voiding status	Before intervention	Self	24	26	0.684
		Diaper	2	-	
		Foley's catheter	4	4	
	After intervention	Self	25	24	
		Diaper	2	1	
		Foley's catheter	3	5	
	p-value (within the group)		0.655	0.180	

*[@] Manwitney u test,[b]Fisher's Exact test, *p<0.05, Wilcoxon signed rank test*

Table 3. Mean anxiety, depression and anxiety scores of COVID patients within and between the groups

Variable	Experimental group n= 30	Control group n= 30	p-value between the groups post intervention
Anxiety			
Pre-test	9.10±4.68	10.53±4.78	0.001
Post-test	4.83±3.68	12.37±3.9	
p value[c](within the group)	0.062	0.001	
Depression			
Pre-test	10.4± 2.91	10.87± 2.75	0.001
Post-test	7.90± 2.41	12.67± 2.65	
p value[c]	0.05	0.001	

*[a] Independent t-test, [c] Paired t-test, *p<0.05*

Table 4. Sleep quality of COVID patients in experimental and control groups before and after the intervention

Items		Experimental group n= 30	Control group n= 30	p-value between the groups
Subjective sleep quality	Pre-test	2(1-3)	2(2-3)	.0.789
	Post-test	1(1-2)	3(2-3)	0.001
p value(within the group)		0.008	0.064	
Sleep latency	Pre-test	2(2-3)	2(1.75-3)	0.825
	Post-test	1(1-3)	3(1-3)	0.047
p value(within the group)		0.021	0.192	
Sleep duration	Pre-test	2.5(1.75-3)	2(2-3)	0.656
	Post-test	1(1-2)	3(2-3)	0.001
p value(within the group)		0.001	0.138	
Habitual sleep efficiency	Pre-test	2(0.75-3)	2(1-3)	0.468
	Post-test	0(0-1)	3(1-3)	0.001
p value(within the group)		0.004	0.335	
Sleep disturbance	Pre-test	1(1-2)	1(1-2)	0.602
	Post-test	1(1-1)	3(2-3)	0.001
p value(within the group)		0.01	0.001	
Day time dysfunction	Pre-test	1(1-3)	2(1-2)	0.09
	Post-test	1(1-2)	2(1-2)	0.119
p value(within the group)		0.324	0.42	
Global Sleep quality Index	Pre-test	12.5(8.75-15)	7(5-10)	0.185
	Post test	11(9-14)	15(10.75-17)	0.01
p value(within the group)		0.285	0.01	

The study by Masih et. al. assessing the effect of relaxation technique on sleep quality in emergency trauma patients showed that there was no significant difference observed in sleep quality before and after the intervention; these results are inconsistent with the present study findings, [25], which can be attributed to the study population.

5. CONCLUSION

The guided meditation was effective in improving the global sleep quality index and alleviating the anxiety and depression to great extent as compared to the standard routine care provided to COVID-19 patients admitted in a tertiary care facility.

STRENGTHS AND LIMITATIONS

The present study has some strength. This study is one of its kind in which the effectiveness of guided meditation on anxiety, depression and sleep quality among COVID-19 patients admitted in a tertiary care facility was studied. COVID patients were provided this intervention at the time of imposed isolation when they wanted the respite. Along with physiological monitoring of the admitted patients and self-reported quality of sleep, it would have been more appropriate to use polysomnography to study the patient's sleep quality. The same could not be done due to resource constraints during COVID pandemic. The other limitations of our study include the psychological conditions and individual differences of the samples, the influence of environment and cultural factors on the individual and the patient's attention during the hospital stay, which were beyond the control of researcher. Absences of blinding, small sample size, not statistically calculated are other limitations of our study. The study needs to be replicated in different settings using a large sample size. The findings of the present study keep a way open to use similar type of interventions for the COVID patients.

CONSENT

Informed written consent was taken from the patients after ensuring the confidentiality of information and anonymity of the subjects.

ETHICAL APPROVAL

Ethical permission was obtained from the institute ethics committee (IEC-1151/2021).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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