



ROLE OF PHYSIOTHERAPY ON COVID HOSPITAL ACQUIRED ANXIETY AND DEPRESSION IN COVID-19 PATIENTS

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Abstract:

Purpose: to assess the level of stress, anxiety and depression in COVID HOSPITAL admitted COVID-19 patients and to find the effectiveness of aerobic training and psychological support by verbal communication in alleviating stress, anxiety and depression in COVID HOSPITAL admitted COVID-19 patients.

Methods: 41 admitted COVID-19 symptomatic patients were recruited for the study. The patients were randomly divided into two groups Group A (Experimental) n=21, and Group B (Control) n=20 by simple randomization. Group A was prescribed deep breathing exercises, psychological support by verbal communication, and mild aerobic activities for a duration of 6 days along with routine COVID-19 medical care. Group B was given only routine COVID-19 medical care. The patients were assessed pretest and posttest by Hospital Anxiety and Depression score (HADS).

Results: All the data were expressed in Mean +/-SD. Paired t-test conducted to find the statistical significance of pre-test and post-test results within the groups and an unpaired t-test was conducted to find the statistical significance between the groups. Group A showed a reduction of 52.58% in depression scores and 60.72% in anxiety scores whereas Group B showed a reduction of 29.09% in depression and 30.15 % in anxiety scores. The results showed that the Physiotherapy has a significant role in reducing hospital-acquired Anxiety and Depression in COVID-19 patients. The results were statistically significant at $p < 0.05$.

Conclusion: Adequate medical care and physiotherapy in the form aerobic activities, deep breathing exercises, psychological support by verbal communication along with effective medicines can alleviate the hospital acquired **anxiety** and depression in these cases.

Key words: COVID-19, Anxiety, Depression, Physiotherapy.

1.Introduction

COVID-19 is a serious pandemic that the whole world is fighting. It is a serious burden on the health care workers, administration, and government on critical care resources due to a large number of patients needing critical care (1). It is estimated that around 5-15 % of COVID-19 patients require critical care in COVID HOSPITAL (2). An intensive care unit is also known as an intensive therapy unit of a hospital that caters the patients with severe or life-threatening illnesses and provides constant and close supervision from life-supporting equipment and medication (3). The COVID HOSPITAL is a complex and stressful environment that is associated with unfavorable physical, psychological, cognitive, and functional consequences for patients (4). It is often observed that patients who survive critical illness experience high rates of anxiety and depression that can persist months to years after hospital discharge (4,5). COVID-19 patients exhibit a wide range and significant psychological stress that can impact the general health of the patient (6). Anxiety, panic, stress, and depression have been linked to infectious epidemics (7). Patients also have the risk of developing social stigma and xenophobia (8). The role of physiotherapists in the management of anxiety and stress is becoming popular and recognized in the current medical scenarios, yet the research base of this practice is limited (9). Aerobic exercises, breathing exercises can be effective in reducing anxiety and depression (10).

2.Patients and Methods

2.1. Study participants and recruitment criteria:

The study was conducted at a LEVEL-3 COVID-19 hospital in Uttar Pradesh, India. A total of 41 COVID-19 symptomatic patients admitted were included in the study after satisfying the inclusion criteria and informed consent (Fig 1).

Inclusion Criteria:

Patients were excluded if they were confirmed COVID-19 patients after lab diagnosis admitted into COVID HOSPITAL, Socially and physically active before COVID-19, Cooperative and Coherent, Willing to participate, Both males and females.

Exclusion Criteria:

Patients were excluded if they were Intubated patients, Patients having severe mental disorders as comorbidity, Unconscious patients, History of Depression or any other psychotic disorders

2.2. Study Design:

The patients were randomly divided into two groups Group A (Experimental) n=21, and Group B (Control) n=20 by simple randomization in the pattern of the first subject in Group A and second in Group B and so on. Group A was advocated deep breathing exercises, counseling, and mild aerobic activities for a duration of 6 days along with routine COVID-19 medical care. Group B was prescribed only routine COVID-19 medical care. The patients were assessed pretest and posttest by Hospital Anxiety and Depression score (HADS). The Physiotherapy was given by trained physiotherapists.

2.3. Intervention:

After satisfying inclusion criteria and consent, the subjects were enrolled for study. The subjects were given deep breathing exercises like Active cycle of breathing technique (ACBT), Proprioceptive neuromuscular facilitation (PNF) in respiration exercises, Active movements of all limbs with 10 repetitions each for a duration of 6 days.

Techniques:

1- Active cycle of Breathing Technique (ACBT): ACBT is an active breathing technique performed by the patient, which helps in clearing the chest and improving the lung function (11).

Technique:

a-The technique is performed in three steps (12)
Breathing control: This helps in relieving the tightness of chest, difficulty in breathing and promotes relaxation. The patients were asked to breath in and gently through the nose while keeping the shoulders relaxed and patient was asked to close the eyes and concentrate on breathing.

b-Deep breathing exercises: The patients were asked to a take a long, slow and deep breath through nose holds for 2-3 seconds and breathes out gently and relaxed like asigh.

c-Forced expiratory technique: The patients were asked to take a long breath in and asked to blow out in a single phase through mouth.

2-Proprioceptive Neuromuscular facilitation of Respiration (PNF): PNF techniques improve the respiratory function such as tidal volume, Inspiratory reserve volume, expiratory reserve volume, Inspiratory capacity, and vital capacity (13).

Technique:

The patients were made to lie flat in supine. The therapist placed his open hands on the lateral surface of 8,9,10 and 11th ribs bilaterally on the patients. The therapist then instructed the patient to take a deep breath, at maximum inspiration the therapist asked the subject to hold the breath for five seconds while

applying minimal manual resistance to the lower ribs bilaterally which is directed downwards and medially. Later the patients were asked to breathe out maximally, at maximal expiration; the therapist pushed the lower ribs bilaterally in downward and medial directions. The cycle was repeated 10 times (14, 15).

The PNF techniques stimulate proprioceptive and tactile stimuli which produce consistent reflexive responses on respiratory muscles leading to expansion of ribs, increased epigastric excursion, respiratory depth and rate (16). It also properly aligns the respiratory muscles with respiratory rhythms (17). The patients were asked to repeat all active light exercises of limbs with 10 repetitions each cycle 3 times a day (Fig 2). The patients were given psychological support by verbal communication daily about the healthy lifestyle and importance of physiotherapy. The patients were

addressed clearly about any queries regarding COVID-19; all efforts were kept removing any myths regarding the COVID-19.

2.4. Assessment:

The anxiety and depression of the COVID hospital admitted COVID-19 patients were assessed by The Hospital Anxiety and Depression Scale (HADS) pre intervention and after 6 days of intervention. HADS SCALE: The HADS scale is frequently used self-rating scale to assess psychological distress in non-psychiatric patients. It consists of 2 subscales that measures anxiety and depression (18). The scale has good internal reliability and validity. The scores are analyzed by summing up of the subscales and interpreted as follows: 0 to 7- Normal, 8 to 11- Borderline abnormal, 11 to 21- Abnormal.

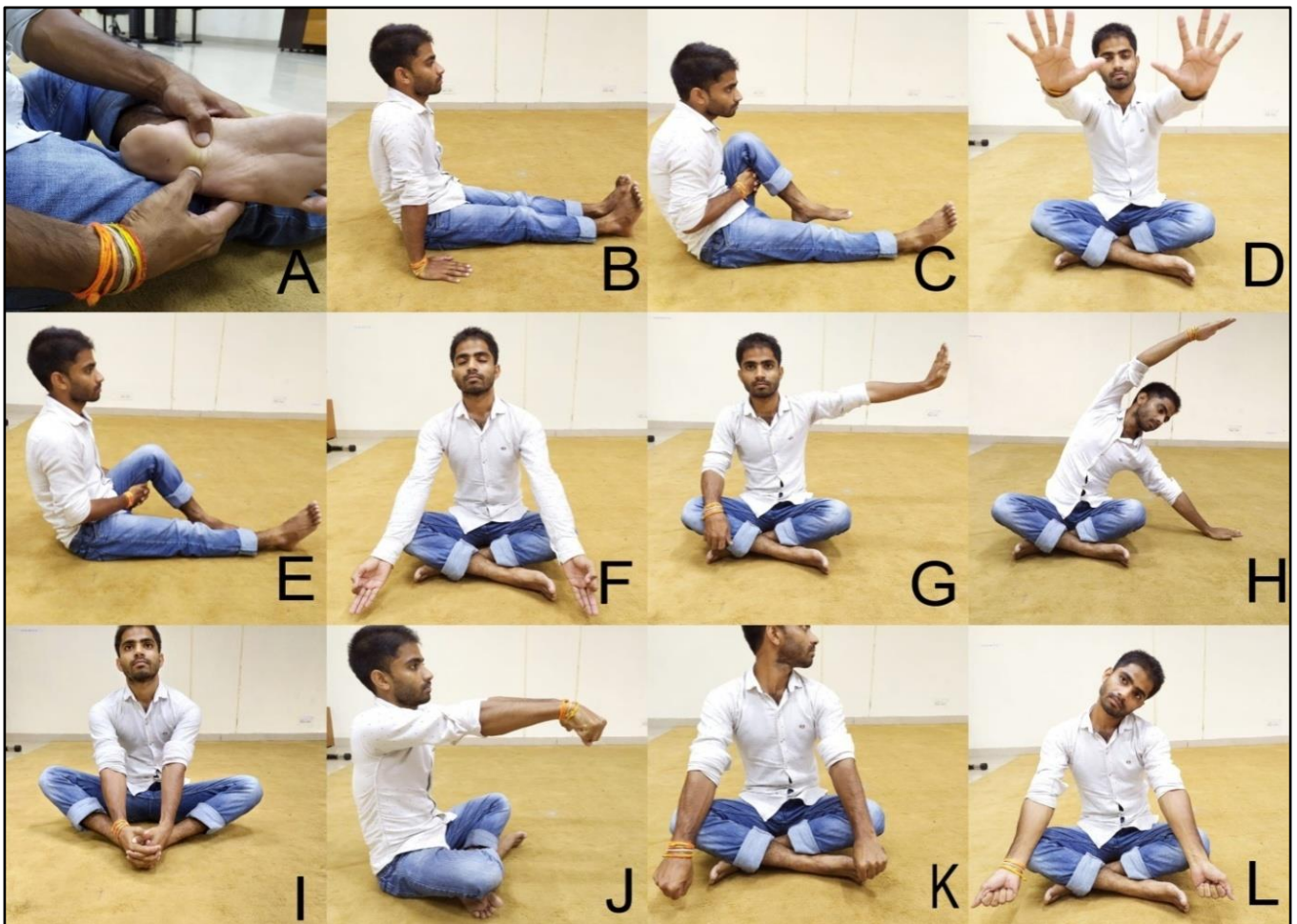
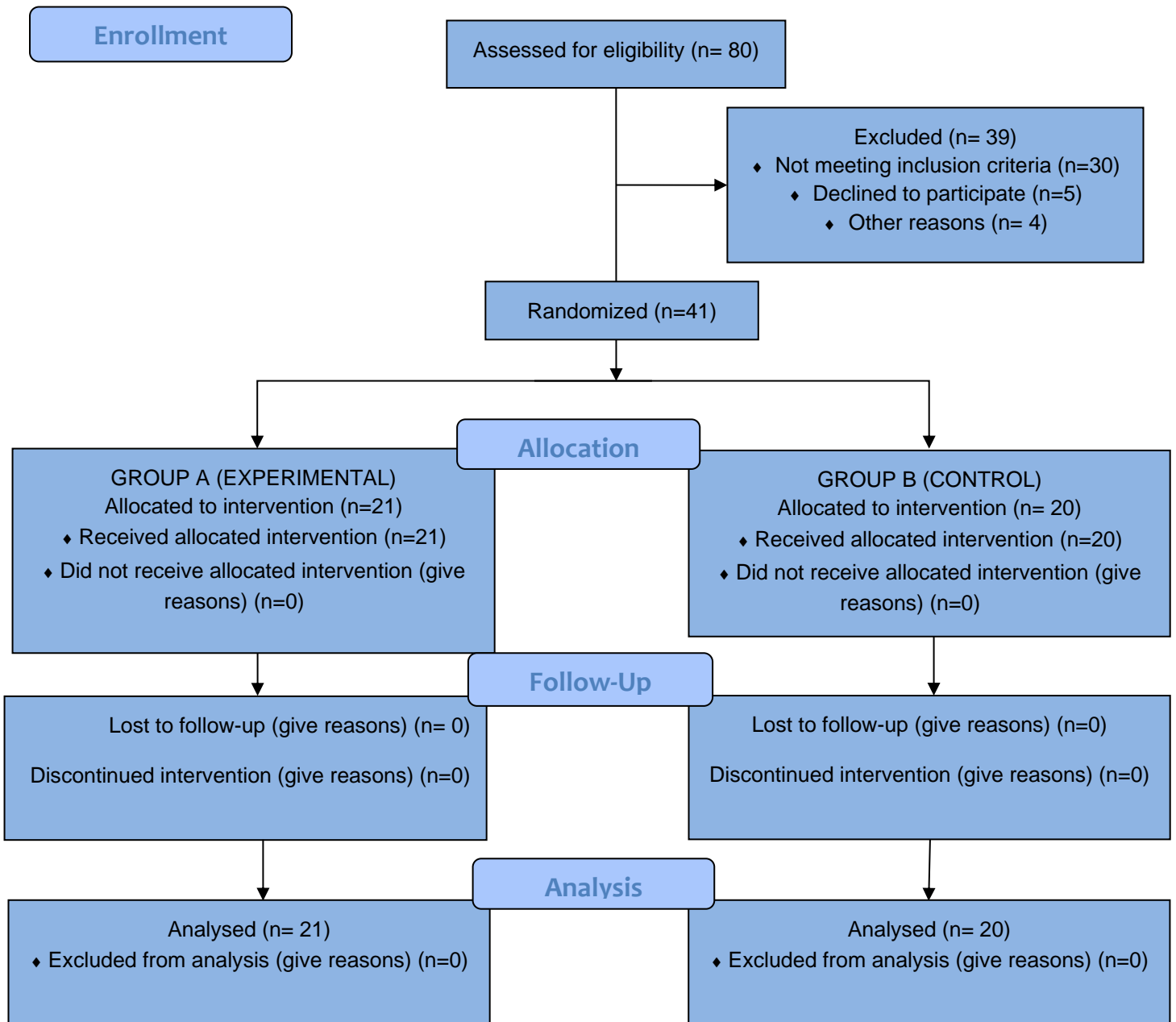


Fig 1: Active light exercises.. A-Foot acupressure B-Foot exercise C-Knee to chest exercise D-Finger exercise E-Knee exercise F-Breathing exercise G-Shoulder exercise H-Trunk exercise I-Butterfly exercise J-Wrist exercise K-Neck rotation exercise L-Neck bending exercise

Figure1: CONSORT 2010 Flow Diagram



3.DATA ANALYSIS AND RESULTS:

The demographic data like age, sex, date of admission was recorded. Student paired t test was used to find the statistical significance within the groups and unpaired t test was used among the groups. The mean age of patients of Group A (N=21) is 44.80 +/-16.72 (Range 17-72) and Group B (N=20) is 45.95+/-15.73 (Range 22-70). The Group A pre-test mean of depression scores is 13.52+/-2.94 and posttest is 6.41+/-2.97, t value 12.65, p<0.05. Anxiety scores pretest mean is 13.57 +/-3.35 and post-test is 5.33+/-2.70, t value -13.19, p<0.05. The Group B pre-test mean of depression scores is 16.5+/-2.039 and posttest is 11.41+/-2.45,t value -9.79, p<0.05. Anxiety scores pretest mean is 16.25 +/-2.21 and post-test is 11.35+/-2.34, t value -8.07, p<0.05. The difference of pretest and posttest means of anxiety and depression in Group A are 7.38+/-2.67,8.23+/-2.86 and Group B are 4.8+/-2.19, 4.9+/-2.71, t value -3.37 and 3.82, respectively. Group A showed a reduction of 52.58% in depression scores and 60.72% in anxiety scores whereas Group B showed reduction of 29.09% in depression and 30.15 % in anxiety scores. The results were significant at p<0.05 (Table 1) (Fig 3). To quantify the difference between two groups and to emphasize the size of difference, effect size was calculated by Cohen's d for depression (1.05) and anxiety levels (1.19), both showed moderate practical significance (Table 2).

Figure 3: COMPARISON OF DEPRESSION AND ANXIETY SCORES IN GROUP A AND GROUP B.

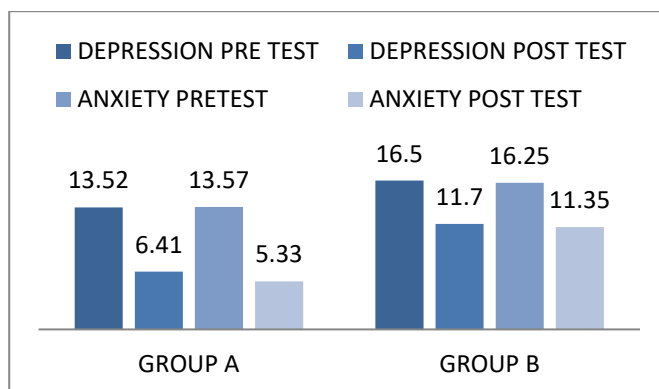


Table 2: effect size of depression and anxiety scores between group a and group b

Group	Cohen's d	effect	Percentage of control group who would be below average person in experimental group.
Depression	1.05	Moderate	84 %
Anxiety	1.19	Moderate	88%

4.DISCUSSION:

In this study to analyze the effect of physiotherapy on COVID HOSPITAL acquired anxiety and depression in COVID-19 patients, the results showed that both group A (experimental) and group B (control), showed a significant decrease in depression and anxiety levels, but group A showed better results than group B. Group A showed a reduction of 52.58% in depression scores and 60.72% in anxiety scores whereas Group B showed a reduction of 29.09% in depression and 30.15 % in anxiety scores. Thus, the results showed that Physiotherapy along with medical management can be indicated for COVID hospital patients to reduce the depression and anxiety levels. COVID-19 is a serious pandemic and often affects the psychological status of the patients. When COVID-19 patients have respiratory distress, they are admitted to the COVID HOSPITAL. COVID HOSPITAL is a stressful environment and often has physical and psychological stress on the patients. Survivors of COVID HOSPITAL are at high risk of experiencing physical, cognitive, and psychological stress and issues in COVID HOSPITAL19. The COVID HOSPITAL acquired anxiety or depression has no association with age, sex, disease severity, or length of stay, unlike the general population²⁰. From recent research on COVID-19, it was evident that the prevalence rates of anxiety and depression are 23.2% and 22.8 % respectively (21,22). The psychological status of patients does affect the immunity of the patients. The biological effects of stress and anxiety have multifaceted effects on immunity including neuroendocrine and neurotransmitter interactions (23). Since ages, physical activity has the potential to improve the quality of life of people with psychological stress and illness including anxiety and depression by improving the

Table 1: comparison of depression and anxiety scores among group a (experimental) and group b (control).

Depression	Pretest	Post Test	t Value	p Value	Pretest-Post Test Differences	t value	p Value
GROUP A	13.52+/- 2.94	6.41+/- 2.97	12.65	p<0.05	7.38+/-2.67	3.82	p<0.05
GROUP B	16.5+/-2.03	11.7+/- 2.45	-9.79	p<0.05	4.8+/-2.19		
Anxiety	Pretest	Post Test	t Value	p Value	Pretest-Post Test Differences	t value	p Value
GROUP A	13.57+/- 3.35	5.33+/- 2.70	-13.19	p<0.05	8.23+/-2.86	3.82	p<0.05
GROUP B	16.25+/- 2.21	11.35+/- 2.34	-8.07	p<0.05	4.9+/-2.71		

physical health and by alleviating psychiatric and social disability (24).

The physical activity reduces the harmful effects of stressors. Neurotransmitter release, neurotrophic factor and neurogenesis, and cerebral blood flow alteration are some of the concepts involved (25). The regular minimums to moderate aerobic exercises and deep breathing exercises have acute effects on anxiety and depression. These reduce anxiety and depression levels after single sessions of exercise by endorphin and monoamine hypotheses (26). During the exercise, there is an increase in blood circulation in the brain to have an impact on the hypothalamic-pituitary-adrenal axis and physiological reactivity to stress. There is also improvement of self-efficacy, distraction, and cognitive dissonance (26).

Breathing exercises can decrease the respiration frequency (tachypnea) and maximize the amount of blood gases (27). Various studies have found that deep breathing exercises are effective relaxation techniques with outstanding physical and mental health benefits (28,29). Breathing exercises stimulate vagal activation of GABA pathways from the prefrontal cortex and insula, to inhibit amygdala over activity (30).

5.CONCLUSION:

In this study, experimental group showed a reduction of 52.58% in depression scores and 60.72% in anxiety scores whereas control showed reduction of 29.09% in depression and 30.15 % in anxiety scores. Thus, through this study, we conclude that adequate medical care and physiotherapy in the form aerobic activities, deep breathing exercises, psychological support by verbal communication along with effective medicines

can alleviate the hospital acquired anxiety and depression in these cases. This study also suggests health care professionals to incorporate physiotherapy services in COVID-19 rehabilitation.

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