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EFFECTIVENESS OF NATURE-BASED SOUND INTERVENTION ON AGITATION, ANXIETY AND STRESS AMONG PATIENTS UNDER MECHANICAL VENTILATOR SUPPORT IN SELECTED HOSPITALS AT MANGALORE

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ABSTRACT

Mechanical ventilation (MV) is a device used to support the respiratory function of patients with various degree of respiratory distress or failure. While this intervention itself a life saving treatment, patients who are mechanically ventilated often face a variety of distressing situations including anxiety and agitation due to emotional distress. The research was carried out to assess the effectiveness of Nature based sound intervention on agitation, anxiety and stress among patients under mechanical ventilator support. An experimental, time series design was used for the study. Using purposive sampling technique, 30 mechanical ventilator patients were selected and 15 were assigned to experimental and 15 to control group. Data was collected using Richmond Agitation Sedation Scale, Faces Anxiety Scale and Observation checklist for physiological signs of stress were used for assessing agitation, anxiety and stress level. There was a significant difference between the pre-test and post-test scores of agitation level (W=0.816,p<0.001) in the experimental group compared to control group. There was a significant difference between the pre-test and post-test score of anxiety level (W=0.759, p<0.001) in the experimental group compared to that of control group. Study also showed significant difference in the post-test score of systolic blood pressure and respiratory rate parameter (t=2.051,p<0.001) between experimental control group. The findings of the study concluded that Nature-Based Sound intervention was effective non-pharmacological method to reduce agitation and anxiety level in mechanical ventilator patients.

Key words: Effectiveness; Nature-Based Sound intervention; agitation; anxiety; stress; mechanical ventilator patients.

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INTRODUCTION

Mechanical ventilation (MV) is a common, life saving and frequently employed treatment modality for a variety of medical diagnoses in intensive care units(ICU). Nurse in the ICU frequently administer sedative medication to ventilated patients to counteract the negative effects of treatment. The medications administered to alleviate pain and anxiety amongst other things may in turn cause anxiety, agitation, or delirium but specific action of a sedative or amount of sedation administered may lead to various harmful effects [1-4].

According to the National Health Insurance research database of Taiwan, there were 8,906,406 individual who obtained respiratory care during period from 1997 to 2007 [5]. Projecting to national estimates (2005), there were 7,90,257 hospitalizations involving mechanical ventilation in United states of America representing 2.7 episodes of mechanical ventilation per 1000 population [6]. In India(2003) rate of mechanical ventilation is in the range of 9.8-67.6% [7]. Anxiety is a common symptom in patients

receiving mechanical ventilation. Closely related to anxiety is agitation. Anxiety and agitation may be a result of fear, unrelieved pain, difficulty in communicating, or lack of sleep these symptoms can be due to numerous physiological and psychological perturbations, but they can also be associated with common ICU procedures such as weaning. Patients receiving mechanical ventilation often have either intermittent or sustained periods of anxiety and/or agitation [8].

Complementary therapies, if used on a routine basis, can help reduce anxiety [9]. Sedative drugs do not have to be the first choice in attempts to mitigate patients distress associated with MV support. Non–pharmacological approaches consist of a variety of environmental adjustments that are frequently underutilized [10].

According to Munro & Mount (1978), "music therapy is the controlled use of music and its influence on the human being to aid in physiologic, psychologic, and emotional integration of the individual during treatment of an illness or disability". The purpose of music therapy is also to promote the client's health and wellbeing. Although music therapy has been shown to be an effective intervention in the care of patients under MV, not all patients welcome this intervention.

In this respect, sound therapy has been used to reduce anxiety and distress and improve physiological functioning in medical patients; however its effect on patients under mechanical ventilation support needs to be investigated. Music therapy as an alternative non-pharmacologic intervention which can be implemented by nurses. One such intervention can be the use of music therapy in the population of mechanically ventilated patients. Music can be used to manipulate the environment by the nurse to provide a comforting place for patients [3].

During the clinical experience, the investigator found that majority of mechanically ventilator patients faced a variety of distressing situations including anxiety and agitation due to emotional distress and in order to overcome these problems, nurses in ICU frequently administered sedative medication, but this could lead to further harmful effects. Hence, the investigator felt the need to conduct a study on the effectiveness of Nature-Based Sound intervention on agitation, anxiety and stress in patients under mechanical ventilator.

Statement of the Problem

Effectiveness of Nature-Based Sounds intervention on agitation, anxiety and stress in patients under mechanical ventilation support in selected hospitals at Mangaluru.

OBJECTIVES

1. To determine the agitation, anxiety and stress level of patients on mechanical ventilator support in the experimental and control group before intervention.
2. To compare the agitation, anxiety and stress level of patients on mechanical ventilator before and after the Nature-Based Sound intervention in the experimental group.
3. To compare the agitation, anxiety and stress level of patients on mechanical ventilator before and after the Nature-Based Sound intervention between control group and experimental group.
4. To find the association between the post-test score of anxiety, stress, agitation with demographical and clinical factors.

HYPOTHESES

The hypotheses will be tested at 0.05 level of significance.

H_1:There will be a significant difference between the pre-test and post-tests scores of agitation level on mechanical ventilator patients receiving Nature-Based Sound intervention.

H_2:There will be a significant difference between the pre-test and post-tests scores of anxiety level on mechanical ventilator patients receiving Nature-Based Sound intervention.

H_3:There will be a significant difference between the pre-test and post-test scores of stress level on mechanical ventilator patients receiving Nature-Based Sound intervention.

H_4:There will be a significant difference in the post-test scores of agitation level in mechanical ventilator patient between experimental and control group.

H_5:There will be a significant difference in the post-test scores of anxiety level in mechanical ventilator patient between the experimental and control groups.

H_6:There will be a significant difference in the post-test scores of stress level in mechanical ventilator patients between the experimental and control groups.

H_7:There will be a significant association between the post-test scores and selected demographic and clinical factors in the experimental group.

MATERIALS AND METHODS

Non-equivalent control group design with time series research design was used in the study. By using purposive sampling technique 30 mechanical ventilator patients were selected and patients were randomly assigned to the experimental group (n_1= 15) and control group (n_2= 15). Demographic and clinical proforma and observation checklist for physiological signs of stress were developed for assessing the baseline proforma and physiological signs of stress level, whereas faces anxiety scale for assessing the anxiety and Richmond Agitation Sedation scale for assessing stress level. Nature-Based

Sound intervention was administered to the patient for 90 minutes in mobile through headphone immediately after the pre-test only to the experimental group patients whereas to the control group patients were headphones without Nature-Based Sound intervention. Post-test agitation, anxiety and stress level was assessed 30, 60, 90 and 120 minutes after administering intervention for the experimental and without intervention for the control group. Both descriptive and inferential statistics were used for data analysis.

RESULTS
Section 1: Description of Demographic Characteristics of Sample

The highest number of sample in the experimental group (46.7%) were above 66 years and control group(33.3%) were in the age group of 31-50 years and 66 and above. The least percentage in the experimental group (20%) were in the age group of 51-65 years and in control group (13.4%) were in age group of 51-65 years. Majority of subjects in the experimental group (66.7%) and control group (80 %) were males. Majority of subjects in the experimental group (53.3%) and control group (60%) had GCS score above 9.Majority of subjects in the experimental group (73.4%) and control group (80%) were hospitalised for less than 1 week. All the subjects (100%) in the experimental and majority of subjects in the control group (86.6%) were on mechanical ventilator for less than 1 week. The highest percentage of the subjects in the experimental group (46.8%) and control group (46.8%) had apnoea or impending inability to breath. The highest percentage of sample in the experimental group (80%) was not on any sedatives and 20 % of them were on fentynyl and the highest percentage in the control group (66.7%) were not on any sedatives.

Data in Figure 6 and 7 show that both in control and experimental group $Sp0_2$ was same in all the post-test periods but in other parameters such as systolic blood pressure, diastolic blood pressure, heart rate and respiratory rate, there was a slight reduction in the same from the pre-test to post-tests in the experimental group. Whereas in the control group, show that there was no difference in any of the parameters such as systolic blood pressure, diastolic blood pressure, heart rate, respiratory rate and SPO_2 from the pre-test to post-test.

Section C: Effectiveness of the Nature-Based Sound Intervention on Agitation, Anxiety and Stress Level in Patients Under Mechanical Ventilator Support in the Experimental Group

following hypothesis is stated. To test the hypothesis unpaired 't' test was used.

$H0_6$:   There is no significant difference in the post-test scores of stress level between the experimental and control group.

This section deals with the significance of difference between the pre-test and 4 post-test scores of subjects of the experimental group assessed at 4 different periods of time. The following null hypothesis is formulated to test the difference between the pre-test and post-tests scores of agitation level and anxiety level on mechanical ventilator patients in the experiment group.

$H0_1$:   There is no significant difference between the pre-test and post-tests scores of agitation level on mechanical ventilator patients in the experiment group.

$H0_2$:   There is no significant difference between the pre-test and post-tests scores of anxiety level on mechanical ventilator patients in the experiment group.

To test the hypotheses $H0_1$ and $H0_2$ Kendall's Tau test, a non parametric test is used to find the significance difference between the pre test and post-test scores in the experimental and control group in case of ordinal level variables.

To determine the difference between the pre-test and post-tests scores of stress level $H0_3$ is formulated.

$H0_3$:   There is no significant difference between the pre-test and post-tests scores of the stress level on mechanical ventilator patients in the experiment group.

ANOVA was used to test the difference among the means of three or more independent groups, i.e., the significant difference between the pre-test and post-tests scores of stress level of patients on mechanical ventilator in the experiment group.

Comparison between the post-test scores between the experimental and control group

This section deals with the significance of difference between the post-test scores of subjects between the experimental group and control group.

$H0_4$:   There is no significant difference in the post-test agitation level between the experimental and control group.

$H0_5$:   There is no significant difference in the post-test anxiety level between the experimental and control group.

To test these hypotheses, Chi-square test (χ^2), which is a non-parametric test of statistical significance is used to assess and study the difference between nominal level variables.[65] It is qualitative and to find the difference between two independent groups, Chi-square test is used.

Significance of Difference between the Post-test Stress Level of the Experimental and Control Group

To find the difference between the post-test stress level of the experimental and control group the

Section D: Association between the Post-test Score of Agitation, Anxiety, and Stress Level with the Selected Demographic Variables and Clinical Factors

H[7]: There will be a significant association between the post-test scores and selected demographic and clinical factors in the experimental group.

Chi-square (χ^2) test was used to test the association of the post-test agitation score and anxiety score with the selected demographic variables and clinical profoma. Kruskal Wallis test is used to test the difference between two or more independent group, based on ranked scores. [39] Since the data is in rank order and to find the difference between two independent groups, i.e., post-test

stress score and selected demographic variables and clinical proforma. Kruskal Wallis test was used.

Association of the Post-test Scores and Selected Demographic Variable and Clinical Factors in the Experimental and Control Group

There is no significant association between post-test scores of the experimental group and control group with the selected demographic variables and clinical profoma**.**

Figure 1. Bar Diagram Representing the Percentage Distribution of Sample Based on the Agitation Level of the Experimental Group and Control Group.
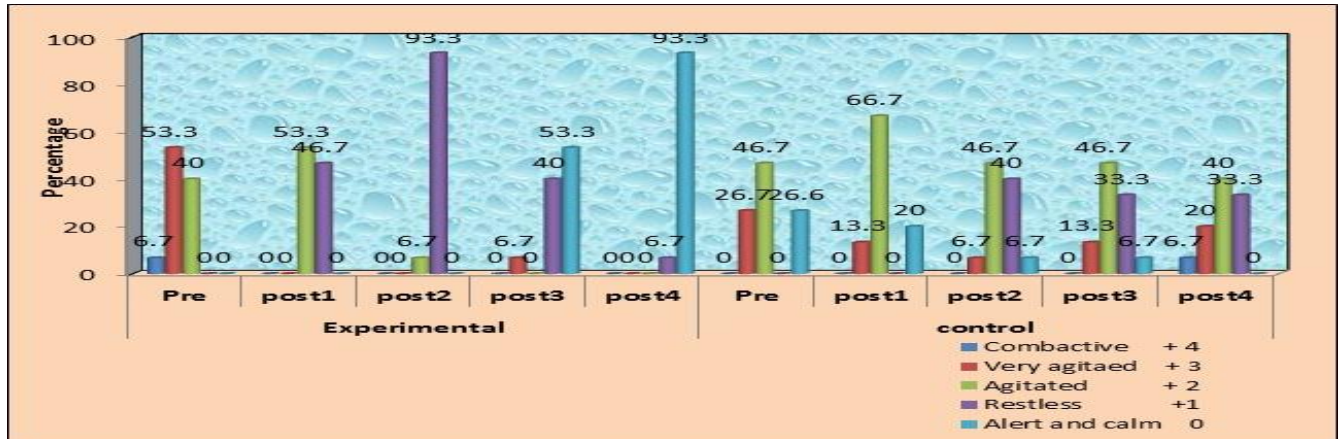
The data presented in the Figure 4 show that in the pre test before the nature based intervention, the highest percentage of subjects in the experimental group (53.3%) and the control group (46.7%) were "very agitated (+3)". In post-test 1, the highest percentage of the sample (53.3%) in the experimental group and control group (66.7%) were "agitated (+2)". In post-test 2, the majority of sample (93.3%) in the experimental group were "restless (+1)" whereas the highest number of subjects (46.7%) in the control group were agitated (+2). In post-test 3, most of the subjects (53.3%) in the experimental group were alert and calm (0) and in the control group (46.7%) were agitated (+2).
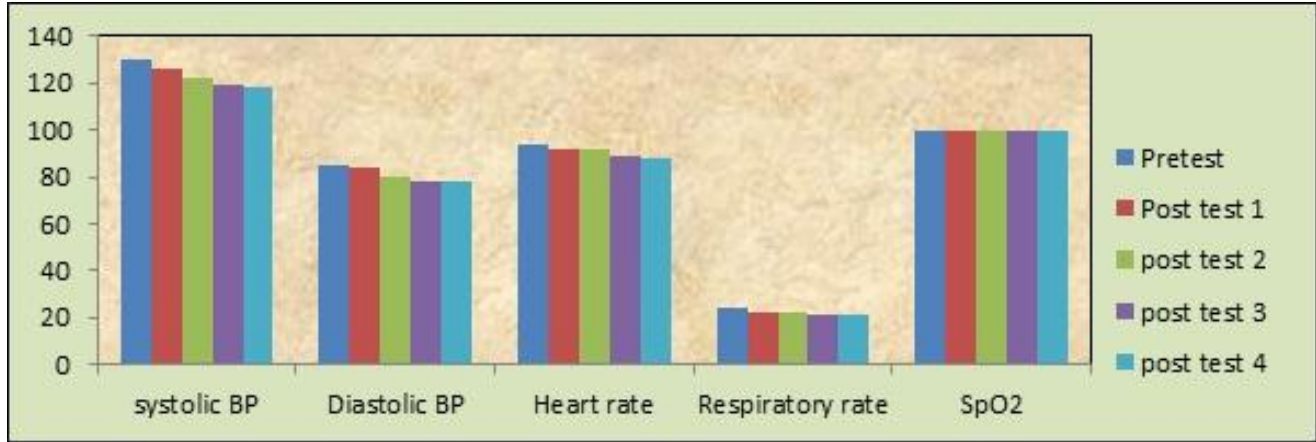
Figure 2. Bar Diagram Representing the Percentage Distribution of Sample Based on the Anxiety Level in the Experimental and Control Group
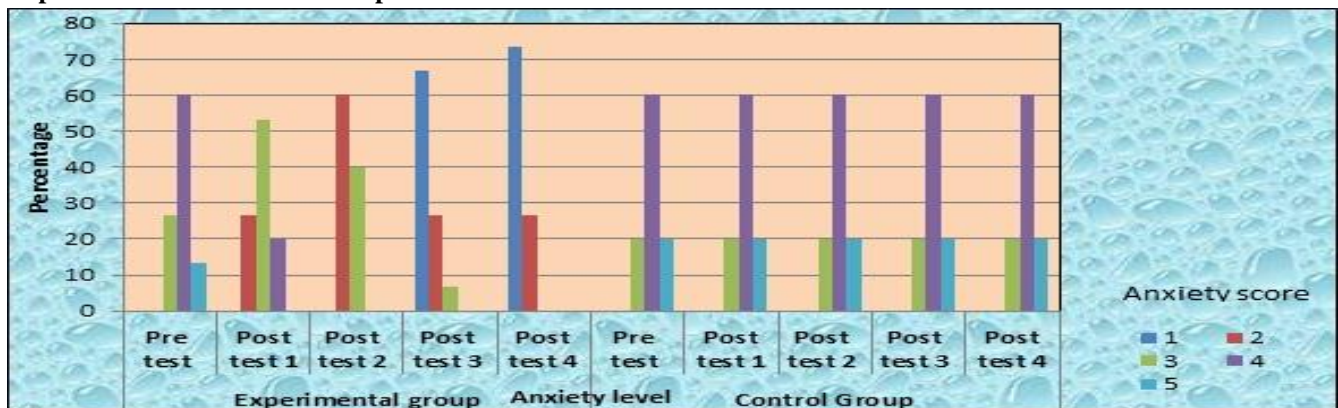

The data presented in Figure 5 show that in the experimental group, majority (60%) of sample had anxiety score 4 in the pre-test and majority (53.3%) of samples had anxiety scores 3 in post-test 1,majority (60%) of sample had anxiety score as 2 in post-test 2 and majority (66.7%) of sample had anxiety score 1 in post-test 3, majority(73.3%) of sample had anxiety score 1 in the post-test 4, where as in the control group, majority (60%) of the sample had anxiety score 4 in the pre-test and post-test 1, post-test 2, post-test 3, and post-test 4 respectively.

Figure 3. Bar Diagram Representing the Pre-test and Post-test Mean Score on the Stress Level in the Experimental Group

Figure 4. Bar Diagram Representing the Pre-test and Post-test Mean Score on the Stress Level in the Control Group
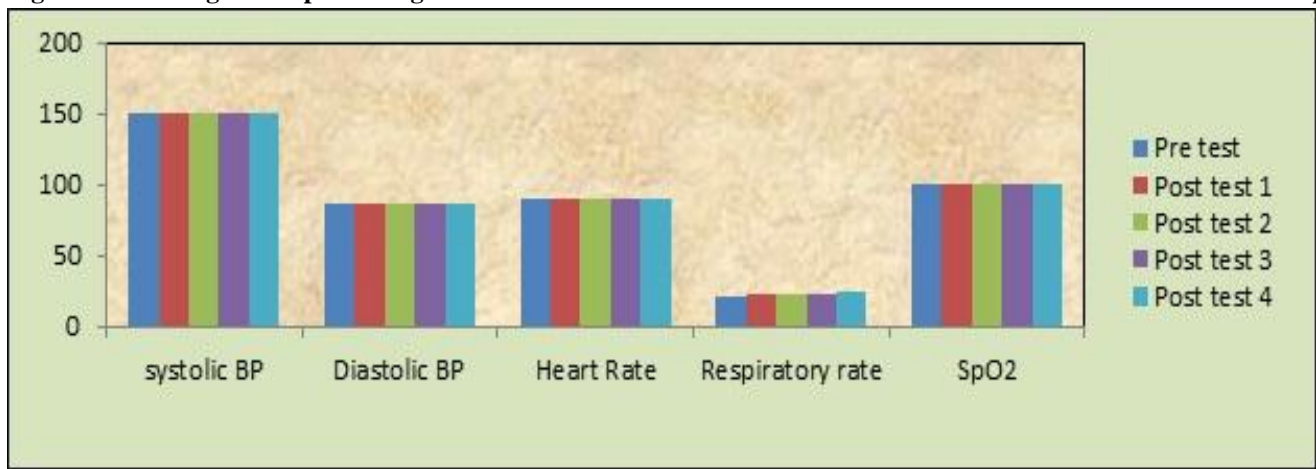
Table 1. Kendall's Test Showing the Significance of Difference in the Pre-test and Post-test Scores of Agitation Level of the Experimental Group

N=15+15

Group	Observation	W value	p value
Experimental	Pre-test to post-test 4	0.816	0.001***
Control		0.064	0.537

P<0.05,*=significant, p<0.01,**=highly significant, p<0.001, *** = very highly significant

Data in Table 5 show that there was a significant difference of pre-test and post-test scores of agitation level (W=0.816, p<0.001) in the experimental group, whereas there was no significance of difference found in the control group. Thus, $H0_1$ was rejected and the research hypothesis was accepted.

Table 2. Kendall's Test Showing the Significance of Difference in the Pre-test and Post-test Scores of Anxiety Level of the Experimental Group

N=15+15

Group	Observation	W value	p value
Experimental	Pre-test to post-test 4	0.759	0.001***
Control		0.000	1.000

P<0.05,*=significant, p<0.01,**=highly significant, p<0.001, *** = very highly significant

Data in Table 6 show that there was a significant difference in the between the pre-test and post-test scores of anxiety level (W=0.759, p<0.001) in the experimental group, whereas there was no significant difference found in the control group. Thus, $H0_2$ was rejected and the research hypothesis was accepted.

Table 3. 'F' Value Showing Significance of Difference in the Pre and Post-test Scores of Stress Level on Mechanical Ventilator Patients in the Experimental Group

N=15

Category	Sum square	df	Mean square	F value
Systolic blood pressure				
Between groups	1880.05	4	470.01	
Within the group	20180.13	70	288.28	1.630
Total	22060.18	74	758.29	
Diastolic blood pressure				
Between groups	543.54	4	135.88	
Within the group	8696.8	70	124.24	1.094
Total	9240.34	74	260.12	
Heart rate				
Between groups	366.74	4	91.68	
Within the group	20654.4	70	295.06	.311
Total	21021.14	74	386.74	
Respiratory rate				
Between groups	120.18	4	30.04	
Within the group	1863.33	70	26.61	1.129
Total	1983.52	74	56.65	
SPO$_2$				
Between groups	.053	4	0.013	
Within the group	.933	70	0.013	1.000
Total	.987	74	0.026	

$F_{(4,70)}=2.53, p>0.05$; Not significant

Data depicted in Table 7 show that there was no significant difference between the pre and post-test scores of stress level of patients on mechanical ventilator in the experimental group. Since one way ANOVA (F value) showed no significant difference between the pre-test and post-test values of the experimental group, further analysis was not done. Hence the null hypothesis $H0_3$ is accepted and research hypothesis H_3 is rejected.

Table 4. Chi-Square Test Showing the Significant Difference in the Post-test Agitation Scores between the Experimental Group and Control Group

N=15+15

Group	Observations	Value	df	p value
Experimental Control	Pre-test	6.410	3	0.093
Experimental Control	Post-test 1	3.822	2	0.148
Experimental Control	Post-test 2	9.700**	3	0.021**
Experimental Control	Post-test 3	12.035**	3	0.007**
Experimental Control	Post-test 4	26.667***	4	0.001***

$\chi_2^2=5.991$, $\chi_3^2=7.815$, $\chi_4^2=9.488$, p<0.05, *=significant, p<0.01**=highly significant,
p<0.001, ***=very highly significant

The data in Table 8 show that there was no significant difference in the post-test 1 agitation scores in the experimental and control group (post-test-1 $\chi^2 = 3.82$, p<0.001) but there is a significance difference in the post-test 2, 3, 4 respectively (post-test 2- $\chi^2=9.70$, Post-test 3- $\chi^2 = 12.035$, post-test-4 $\chi^2=26.66$, p<0.001) between the experimental group and control group. Hence, the null hypothesis $H0_4$ was partially rejected and research hypothesis was partially accepted.

Table 5. Chi-Square Test Showing the Significant Difference in the Post-test Anxiety Scores between the Experimental Group and Control Group

N=15+15

Group	Observations	Value	df	p value
Experimental Control	Pre-test	0.343	2	0.842
Experimental Control	Post-test 1	12.273**	3	0.007**
Experimental Control	Post-test 2	22.000***	3	0.001***
Experimental Control	Post-test 3	27.000***	4	0.001***
Experimental Control	Post-test 4	30.000***	4	0.001***

$\chi_2^2=5.991$, $\chi_3^2=7.815$, $\chi_4^2=9.488$, p<0.05,*= significant, p<0.01 **=highly significant,
p<0.001, ***=very highly significant

The data in Table 9 show that there was a significant difference in the post-test anxiety scores (post-test-1 $\chi^2=12.27$, post-test-2 $\chi^2 = 22$, post-test-3 $\chi^2=27$, post-test-4 $\chi^2=30$, p<0.001) between the experimental group and control group. Hence, the null hypothesis $H0_5$ was rejected and research hypothesis H_5 was accepted.

Table 6. Unpaired 't' Test Showing the Significance Difference in the Stress Level between the Experimental and Control Group

N=15+15

Group	Observations	Systolic BP	Diastolic BP	Respiratory rate	Heart rate	SpO$_2$
E C	Post-test 1	3.346** (.002)	0.847 (.404)	0.037 (.97)	0.411 (0.684)	1.740 (0.93)
E C	Post-test 2	3.880*** (.001)	1.812 (.081)	0.636 (.53)	0.353 (0.727)	1.000 (.326)
E C	Post-test 3	4.430*** (.001)	1.919 (.065)	1.477 (.151)	0.070 (0.944)	0.447 (.658)
E C	Post-test 4	4.450*** (.001)	1.910 (.066)	2.051* (.05)	0.412 (0.68)	1.000 (.326)

t_{28}=2.048, $p<0.05$, *=Significant, $p<0.01$ **=highly significant, $p<0.001$,***=very highly significant
E=Experimental group, C= Control group

The data in Table 10 show that there was a significant difference in the post-test systolic BP (post-test 1-t= 3.346, post-test 2-t=3.880, post-test 3- t=4.430, post-test 4- t=4.450, $p<0.001$) and also significant difference in the post-test 4 respiratory rate parameter (t=2.051, $p<0.001$) between the experimental and control group.

DISCUSSION
Description of agitation level in mechanical ventilator patients

The present study showed that in pre-test before the nature-based intervention, the highest percentage of subjects in the experimental group (53.3%) and the control group (46.7%) were "very agitated (+3)". In post-test 1, the highest percentage of the sample (53.3%) in the experimental group and control group (66.7%) were "agitated (+2)". In post-test 2, the majority of sample (93.3%) in experimental group were "restless (+1)" whereas highest number of subjects (46.7%) in control group were agitated (+2). In post-test 3, most of the subjects (53.3%) in experimental group were alert and calm (0) and in control group (46.7%) were agitated (+2).

A similar study conducted on effect of Nature-Based Sound intervention on agitation, anxiety and stress in patients under mechanical ventilator at Shahed University, Iran also showed that majority (51.7%) of sample in the experimental group had agitation score +2 (agitated) and (48.3%) of sample had agitation score +3 (very agitated) whereas in the control group maximum (63.3%) of sample had agitation score +1 and the highest (36.7%) of sample had agitation score +2 [11].

Description of anxiety level in mechanical ventilator patients

Present study showed that in the experimental group majority (60%) of sample had anxiety score 4 in pre-test and majority (53.3%) of samples had anxiety scores 3 in post-test 1, majority (60%) of sample had anxiety score as 2 in the post-test 2 and majority (66.7%) of sample had anxiety score 1 in post-test 3, majority (73.3%) of sample has anxiety score 1 in post-test 4, whereas in the control group majority (60%) of the sample had anxiety score 4 in pre-test and post-test 1, post-test 2, post-test 3 and post-test 4, respectively. Thus the study showed that there was decrease in the level of anxiety from post-test 1 to post-test 4 (3, 2, 1, 1) respectively among the patients in the experimental group on administration of Nature-Based Sound intervention.

Similar study conducted on effect of Nature-Based Sound intervention on agitation and anxiety in coronary artery bypass graft patients during the weaning of mechanical ventilation at intensive care unit of a teaching hospital in Tehran showed that majority (53.3%) of ventilated patients in the experimental group had the anxiety score 4, highest (38.3%) of patients had anxiety score 5 and least (8.3%) of samples had agitation score 3 whereas in the control group majority (55%) of sample had an anxiety score 5, the highest (33.3%) of sample had anxiety score 4, the least 10% had an agitation score of 3 and the least (1.7%) of sample had an agitation score 2 [12].

Description of stress level in mechanical ventilator patients

The present study showed that in both the control and experimental group, SpO$_2$ was same in all the post-test periods but in other parameters such as systolic blood pressure, diastolic blood pressure, heart rate and respiratory rate, there was a slight reduction in the same from pre-test to post-tests in the experimental group whereas in the control group, showed that there was no difference in any of the parameters such as systolic blood pressure, diastolic blood pressure, heart rate, respiratory rate and SPO$_2$ from the pre-test to post-test groups.

A study conducted to find the effect of music intervention among mechanical ventilator patient among 213 samples in Philadelphia also showed that listening to music consistently stabilised the heart rate and respiratory rate but no evidence was found in reduction of blood pressure or improvement of oxygen saturation [13].

Section C: **Effectiveness of Nature-Based Sound intervention on agitation, anxiety and stress level in patients under mechanical ventilator support in experimental group**

Significance of difference in pre-test and post-test scores of experimental group using agitation scale

The present study showed that there was a significant difference of pre-test and post-test scores of agitation level (W=0.816, p<0.001) in experimental group, whereas there was no significance difference found in control group.

A similar study conducted on effect of Nature-Based Sound intervention on agitation and anxiety in coronary artery bypass graft patients during the weaning of mechanical ventilation at intensive care unit of a teaching hospital in Tehran also showed that there was a significant effect of the time with the marginal modelling for agitation score with the calculated value (p=0.074) [12].

Significance of difference in pre-test and post-test scores of experimental group using anxiety scale

The present study showed that there was a significant difference between the pre-test and post-test scores of anxiety level (W=0.759, p<0.001) in the experimental group, whereas there was no significant difference found in control group.

Findings of a supportive study conducted to assess the effect of music therapy on anxiety and physiological variable in patients under spinal anaesthesia among 90 men in Iran also showed that there was a significant difference in mean anxiety score in 3 groups after the intervention and (p=0.03) compared to before intervention (p=0.88) [13,14].

A study conducted to assess the effect of patient directed music intervention on anxiety and sedative exposure in critical ill patients receiving mechanical ventilator support in Columbus showed that pair wise comparison indicated that patient directed music intervention had a significantly lower VAS–A score at study entry than usual care patients were there sedation intensity or frequency was used [15].

Significance of difference in pre-test and post-test scores of stress level on mechanical ventilator patients in experimental group

In the present study one way ANOVA (F=2.53, p>0.05) revealed that there was no significant difference in the stress level between the pre-test and post-test scores among mechanical ventilator patient in the experimental group.

The supportive study conducted to assess the effect of music therapy on anxiety and physiological variable in patients under spinal anaesthesia among 90 men, Iran also showed that there was a significant difference in mean systolic blood pressure (p=0.00) and as well as mean heart rate (p=0.01) but ANOVA test revealed no significant difference in respiratory and diastolic blood pressure in the 3 groups [14].

Comparison between the post-test score of agitation between experimental and control group

The present study showed that there was no significance difference in post- test 1 agitation scores in the experimental and control group (post-test-1 χ^2=3.82, p<0.001) but there was a significance difference in post-test 2, 3, 4, respectively (post-test 2- χ^2=9.70, post-test 3- χ^2=12.035, post-test-4 χ^2=26.66, p<0.001) between the experimental group and control group.

A supportive study on coronary artery bypass graft patients during the weaning of mechanical ventilation at intensive care unit of a teaching hospital in Tehran also showed that there was a significant difference found between the agitation score in the experimental and control group (p=0.269) [12].

Another similar study conducted to assess the effect of Nature-Based Sound intervention on agitation, anxiety and stress in patients under mechanical ventilator at Shahed University, Iran, also showed that there was significant difference found between the agitation scores in the experimental and control group (p=0.262) [11].

Comparison between the post-test score of anxiety between the experimental and control group

The present study showed that there was significant difference in the post-test anxiety scores (post-test-1 χ^2=12.27, post-test-2 χ^2=22, post-test-3 χ^2=27, post-test-4 χ^2=30, p<0.001) between the experimental group and control group.

A supportive study conducted to assess the effect of music therapy on anxiety in ventilator dependent patients, Hong Kong showed that there was a significant difference at the end of intervention between 2 conditions with music therapy being superior to the period of rest [16].

Comparison between the post-test score of stress between experimental and control group

The present study showed that there was a significant difference in the post-test score of stress among experimental and control group for systolic blood pressure (p=0.001) and respiratory rate (p=0.05) whereas there was no significant difference in post-test score between experimental and control group for diastolic blood pressure (p=0.066), heart rate (p=0.68), and SPO_2 (p=0.326).

A supportive study conducted to find the effect of music intervention for mechanical ventilator patient among 213 samples in Philadelphia also showed that listening to music reduced heart rate and respiratory rate after the intervention but there is no evidence of improvement with the oxygen saturation and reduction in blood pressure [13].

Section D: Association between the post-test score of agitation, anxiety, and stress level with the selected demographic variables and clinical factors

The present study showed that there was no significant association of post-test agitation, anxiety and stress level among the experimental and control group with selected demographic and clinical proforma.

Similarly, the supportive study conducted on coronary artery bypass graft patients during the weaning of mechanical ventilation at intensive care unit of a teaching hospital in Tehran shows that there was no significant difference between post-test scores of experimental and control group on baseline data and clinical proforma [12].

LIMITATIONS

- The study was conducted only in a few hospitals at Mangalore which imposed restrictions on generalization of findings.
- Sample size was limited to 30 because of time constraint.
- The study was conducted only in patients who were cooperative.
- The study included five repeated measures of intervention at interval of 30 minutes and each interval anxiety, agitation and stress level was assessed.

RECOMMENDATIONS

Based on the study findings, the following recommendations are stated:

- The study can repeated in large sample to generalize the findings
- A study can be conducted to analyse the perceived or actual problem of nurses in use of Nature-Based Sound intervention as an independent therapeutic nursing intervention.

- A comparative study can be conducted to assess the benefits of music therapy in acute and chronic care settings to assess anxiety, agitation and stress level.
- A similar study can be tried on different sample characteristics like depression and pain.
- A comparative study with more than one intervention like music therapy and Nature-based visuals can be done to alleviate the tension among mechanical ventilator patients.

CONCLUSION

Studies of this kind should be an ongoing process for the better understanding of the non pharmacological interventions and to include them in the clinical settings. Such type of study will add to the body of knowledge of nursing profession. Findings of the study showed that Nature- Based sound intervention was effective in reducing agitation and anxiety among mechanical ventilator patients.

CONFLICT OF INTEREST

There were no conflicts of interest reported.

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