

## EFFECT OF MUSIC ON PHYSIOLOGICAL PARAMETERS AND ANXIETY IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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### ABSTRACT

**Background:** Respiratory Condition is an umbrella term. It includes many respiratory diseases, amongst which COPD is a leading cause of distress. Hospitalized Patients with COPD often suffer from anxiety due to many underlined causes. Anxiety is an unpleasurable emotional state; it goes hand in hand with COPD condition. Effect of music on anxiety reduction and physiological parameters is culturally known but lacks much attention in treatment settings. So the purpose of this study is to find out the effect of music on physiological parameters and anxiety in COPD patients.

**Materials and Methods:** In this Experimental type of study, carried out in tertiary care hospitals in Pune city, 42 patients were selected by purposive sampling technique as per inclusion criteria, both male and females with COPD and MMRC dyspnoea grade 2 and 3. Pre intervention physiological parameters i.e. Respiratory rate, Heart rate, Blood pressure along with anxiety score using State Trait Anxiety Inventory Scale were checked and noted. After the Music intervention of 15-20 minutes all the outcome measures were checked again and noted. Data collected was analyzed using Paired t-test and Wilcoxon method.

**Result and Conclusion:** P values for RR, PR, SBP, DBP and STAI are 0.00, 0.00, 0.012, 0.001 and 0.00 respectively which are (<0.05) statistically significant. Mean values of RR, PR and STAI have shown significant change, pre and post intervention; whereas mean BP stayed the same. So the study concludes that music has significant effect on physiological parameters and anxiety, and it can be incorporated as a non pharmacological intervention in clinical settings.

**KEY WORD:** COPD, Music, Anxiety, Respiratory Rate, Pulse Rate, Blood pressure.

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### INTRODUCTION

Respiratory condition is an umbrella term which includes many diseases, amongst which COPD is a leading cause of distress. Worldwide in 2001

COPD was 5<sup>th</sup> most common cause of death, responsible for 4.7% of deaths and 2% of disability adjusted life years (DALYs) [1]. A 30 year projection from 1990 predicted a steady rise

in number of COPD deaths to 3<sup>rd</sup> most common cause by 2020 [2]. In South Africa respiratory disease as a group (excluding TB) was ranked as the 7<sup>th</sup> most important cause of DALYs (4.7%) in 2000 [3].

Inspite of medications, Hospitalized patients with COPD often suffer from anxiety due to many underlined causes like uncertainty regarding surroundings or progression of symptoms, isolation from family etc. Dyspnoea is a major concern; it is a condition when patient becomes painfully aware to breathe more. They tend to hyperventilate causing short of breath and air hunger is produced. In respiratory pathology, diaphragm is mainly affected because of underlined obstructive as well as restrictive condition; which restricts respiration resulting in shallow breathing. Shallow breathing increases work of breathing and it costs accessory muscles of ventilation to work more. More energy expenditure associated with state of hypoxia due to metabolic alterations causes generalized weakness and distress. So the patient is not completely relaxed and becomes more distress and anxious. In this way Anxiety goes hand in hand with respiratory condition [4].

Anxiety is “An unpleasurable emotional state, associated with psycho-physiological changes in response to an intra-psychic conflict”[5]. Anxiety is a state of apprehension and it becomes pathological when it causes significant subjective distress or impairment in normal individual as well. Anxiety is significant co-morbid and potentially modifiable factor in patients with COPD. Many non-pharmacological interventions are studied to reduce anxiety. According to Munro and Mount (1978),”Music therapy is the controlled use of music and its influence on the human being to aid in physiological, psychological and emotional integration of the individual during treatment of an illness or disability.” Significant reduction in physiological parameters was observed in asymptomatic individuals immediately after listening to the music [6].

Suhartini studied and proved the Power of music in hospital wards to aid in the healing process of soldiers injured in the war [7].

Effect of music is culturally known, despite this, music has not given much attention in medical

settings. So it becomes an area of concern to study if non-pharmacological music therapy can be used as a supportive treatment in COPD patients.

## MATERIALS AND METHODS

After approval from the ethical committee of the Institutes, this experimental type of study was done in tertiary care hospitals of Pune city. Where 42 patients both male and females with COPD and MMRC dyspnoea grade 2 and 3 were included by purposive sampling technique. Patients on sedatives or anti anxiety, unconscious, psychologically disturbed and having major hearing problems were excluded from the study.

Written informed consent form was taken from them.

Baseline parameters for RR, PR, BP and STAI [8, 9] score was checked and noted. 15-20 min [10] of soothing instrumental music intervention of 60-90 beats per minutes was given through headphones. Post intervention again RR, PR, BP and STAI was checked and noted. Data collected was analyzed using appropriate statistical tests.

## RESULTS

Paired-t test was used for the pre and post intervention for analysis of parametric data of respiratory rate, pulse rate, systolic and diastolic blood pressure. P value for which are 0.00, 0.00, 0.001 and 0.012 respectively; which is significant as it is less than set p value of 0.05.

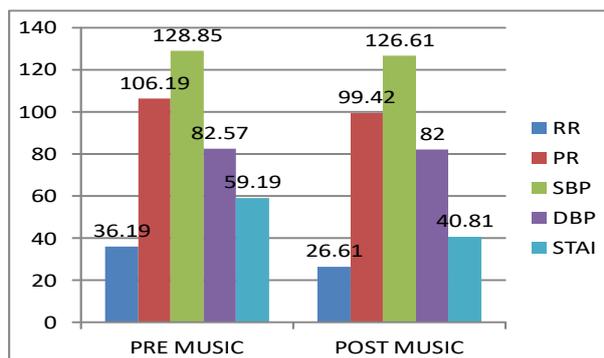
Wilcoxon test was used for pre and post intervention for non-parametric data of STAI score P was 0.00 which suggests that it is significant and less than set p value of 0.05.

Table 1 and Graph 1 shows statistical values for mean, standard deviation and p-value of pre and post intervention values of RR, PR, BP and STAI.

**Table 1:** Pre & Post values for mean standard deviation and p value.

	pre	post	P-value
Pulse rate	106.19 ± 10.19	99.42 ± 8.81	0
Systolic BP	128.15 ± 7.24	126.61 ± 5.19	0.001
Diastolic BP	82.57 ± 5.39	82.00 ± 4.89	0.012
Respiratory rate	36.19 ± 4.58	29.61 ± 3.64	0
STAI score	59.13 ± 7.72	40.81 ± 8.53	0

**Graph 1:** comparison of pre and post intervention values of RR, PR, SBP, DBP and Anxiety STAI score.



## DISCUSSION

The ultimate goal of any study is to enhance patient's comfort as compared to baseline condition at the time of admission and prevent associated secondary complications. Aim of this study was to find out effect of music on physiological parameters and anxiety in patients with COPD.

Anxiety and Breathlessness becomes major concern in hospitalized respiratory patients [4]. Many alternatives like breathing exercises, music, muscle relaxation techniques [11] etc. are known as a non pharmacological ways to reduce anxiety.

Suhartini in 2009 studied and proved the Power of music in hospital wards to aid in the healing process of soldiers injured in the war [6].

Study done by Nilsson U, Unosson M and Rawal N. proved that, music therapy may reduce Anxiety, pain and morphine consumption on patients having open hernia repairs [12].

Soothing instrumental music of 60-80 Beats per minute [11] coincides with normal range of heart rate. Patient tends to lower down all the increased vital parameters to normal range as per rate and rhythm of the music; without conscious efforts. Study believes that Instrumental music avoids any bias which could have hampered the results due to lyrical and language barriers. Mount and Munro studied and concluded that, music intervention is the controlled use of music and its influence on human being; aid in physiological, psychological and emotional integration during treatment of diseases.

Article in MNHPC in 2015 on Dyspnoea Anxiety and Music coated following Dyspnoea anxiety cycle.

This cycle says that because of longer hospital stay, patients suffer from anxiety leading to increased sympathetic response, HR, RR. It further leads to increased O<sub>2</sub> demands and respiratory drive which leads to more energy expenditure and dependency level responsible for anxious behavior.

So effectively reversing this cycle, in the present study patients Showed significant response to music. With P values (0.00, 0.001, 0.012, 0.00 and 0.00) for PR, SBP, DBP, RR and STAI respectively. Mean HR, RR and STAI showed significant change though mean BP stayed the same.

## CONCLUSION

Music intervention helped in reduction of physiological parameters (respiratory rate, heart rate, Blood pressure) and anxiety in patients with COPD.

**Clinical Implications:** Music is a non-pharmacological, non-invasive, easy to practice, safe and inexpensive. It can be given as supportive physiotherapy treatment at any time without much prior preparation and without any adverse effect.

## ABBREVIATIONS

- COPD** - Chronic Obstructive Pulmonary Disease
- MMRC** - Modified Medical Research Council
- RR** - Respiratory Rate
- PR** - Pulse Rate
- SBP** - Systolic Blood Pressure
- DBP** - Diastolic Blood Pressure
- STAI** - State Trait Anxiety Inventory
- DALYS** - Disability Adjusted Life Years
- BP** - Blood Pressure

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