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A study on music therapy as a method of coping with depression in patients with cancer in PRH, Loni

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Abstract
Background: Cancer diagnosis causes a huge impact on patients, their families and caregivers. To distract patients from unpleasant symptoms, music therapy can be included in the treatment.
Objective: To assess the severity of depression in cancer patients pre and post music therapy using Patient Health Questionnaire-9 and Depression Anxiety Stress Scale-42.
Design: Descriptive cross sectional study.
Materials and Method: 30 participants were recruited; the severity of their depression was evaluated using PHQ-9 and DASS-42. Music therapy was given to the participants for 4 weeks for 20 minutes. Effects of the intervention were reassessed after 4 weeks
Result: There was significant difference in mean values of severity of depression pre and post intervention as p value is <0.0001, measured using paired t test.
Conclusion: Music therapy improved Quality of Life and mental health of the patients.

Keywords: cancer, depression, music therapy, quality of life, PHQ-9, DASS-42

Introduction

Cancer diagnosis affects your emotional health. It can have a huge impact on most patients, families, and caregivers. This life changing experience can cause a cancer patient to have feelings of depression, anxiety, and fear which are very common and are normal responses [1]. Cancer remains one of the most feared diseases despite advances in early detection and effective treatment, due not only to its association with death but with disability. Pain, depression, and fatigue are the most common side effects of cancer and treatments for cancer[2].This can change the body image and can impact self-esteem and confidence. Emotional distress may be also due to physical symptoms such as pain, nausea, or extreme tiredness. Family members and caregivers may be afraid of losing their loved one which cause them to be frustrated that they "can't do enough," or stressed because they have to take on more at home. It's normal to grieve over the life changing experience that cancer brings to a person[3]. It's normal for cancer patients to experience sadness and grief because their future, which may have seemed so sure before, now becomes uncertain, some dreams and plans may be lost forever, changes in self-esteem and body image, disruption of social roles, financial challenges and end-of-life issues [4].

There is a genetic alteration, the activation of proto-oncogenes and inactivation of tumor suppressor genes in affected cells which are the core molecular events that provide a selective growth advantage and clonal expansion during the multistep process of carcinogenesis. TP53 mutations are a biomarker of carcinogen effect. The p53 protein modulates numerous cellular functions, such as DNA synthesis and repair, gene transcription, cell cycle arrest, apoptosis and senescence. Mutations in the TP53 gene can abrogate these functions which lead to genetic instability and progression to cancer[5]. Regardless of age or health, it's good to know the signs of cancer; Pain- some brain tumors cause headaches that last for days and don't get better with treatment, weight loss without trying, fatigue, fever, changes in your skin like new moles, bumps, or marks, sores that don't heal, spots that bleed. There is a higher risk of oral cancer in Tobacco chewers and alcohol consumers. Changes in testicles or penis, trouble peeing, change in bowel habits, continuous bleeding or discharge from vagina, changes in appetite, bloating, breast changes like lumps, changes in size, unusual discharge from your nipples, visible spots or other changes in the skin around your nipples are also few signs of cancer. Early detection of cancer has a better prognosis [6].

Most of the people with cancer may suffer from major depressive disorder, adjustment disorder with depressed mood, and mood disorder secondary to general medical condition [2].Symptoms of depression occur on a spectrum that ranges from sadness to major affective disorder, and mood change is often difficult to evaluate when a patient is confronted by repeated threats to life, is receiving cancer treatments, is fatigued, and/or is experiencing pain. Severity of depression can be categorizes as: major depression, minor depression, depressive disorder, adjustment disorder with depressed mood, or dysthymia. Medical and socio demographic factors as well as the method and timing of the assessment may afftect the rates of depressive disorders and depressive symptoms in cancer [2].

Music is known to aid in fighting cerebrovascular disease by activation of parasympathetic nervous system, lowering concentrations of IL-6, tumor necrosis factor (TNF), adrenaline, and noradrenalin. Biochemical messenger production provides a calming effect in severely ill patients. It has proven effective in improving the immune function [7].

Regardless of being mentally active, resting or asleep, the brain always has some level of electrical activity which is a good indication of brain activity.

Alpha waves (range between 7 to 12 Hz)
It gives the brain and body deep rest. The Alpha state is generally brought on by de-focusing one's attention, they are naturally produced by the brain, when you relax but in this relaxation you are alert, but not drowsy or sleepy.

Beta waves (range between 13-40 Hz)
The Beta state is associated with heightened mental activity, visual acuity and peak concentration. Beta activity is "fast" activity and can often be associated with states of anxiety.

Theta waves (range between 4-7 Hz)
Theta brain waves are slow and relaxing brainwaves located in the right hemisphere of the brain and usually arise when we are dreaming, sleepy, emotional or relaxing.

Delta waves (range between 0-4 Hz)
Delta waves occur during periods of deep sleep. The delta brainwave rhythm is known to completely replenish, rejuvenate and heal the entire body and brain. They are not only abundant in those who are in deep meditation but they are also abundant in newborn infants, young children, people with A.D.D or A.D.H.D, people who have had near death experiences, or people who have experienced head injuries.

Gamma Waves (range 32-48 Hz)
Gamma brainwaves are considered the brain's optimal frequency of functioning. They are commonly associated with increased levels of compassion, feelings of happiness, and optimal brain functioning and are associated with a conscious awareness of reality and increased mental abilities [8].

Materials and Methodology
The study was approved by the Institutional Ethical Committee of Physiotherapy Department, Pravara Rural Hospital, Maharashtra state, India. Consent from the department of Oncology and Radiation therapy of PRH, Loni was also taken.

Participants
30 subjects were recruited by convenience sampling.
Inclusion criteria: Patients aged between 40-60 years, diagnosed with cancer, receiving chemotherapy or radiotherapy, willing to participate were selected for the study.
Exclusion criteria: Subjects diagnosed with brain tumor or having any cognitive impairment and those who had communication problem were excluded.
All the participants were informed that the use of the collected data is purely for the purpose of the study and that the recordings would be destroyed at the end of the study. The subjects were also informed about the anonymity of their names and other identifiable traits.

Study design
It is a descriptive cross sectional study.

Outcome Measure
Demographic data was obtained and a detailed assessment was done. The dependent variables used in this study were Patient Health Questionnaire-9 and Depression Anxiety Stress Scale-42 to assess the severity of depression, anxiety, stress pre and post intervention.

Procedure
For the purpose of intervention, subjects were divided into 5 groups. Two groups of 6 participants in each were considered for a day, 5 days weeks for 4 weeks then other 3 groups were considered for next 2 months consecutively.
Participants were gathered in a well-ventilated, spacious and quiet room. They were made to sit comfortably on chairs with arm support and back rest. Instructions to turn off their mobile phones or keep them on silent mode, to maintain silence, to concentrate on the breathing pattern, and to concentrate on the music throughout the session were given to them prior to each intervention. The music containing alpha waves was played for 20 minutes for 5 days a week for 4 weeks.

Data Collection
Patient Health Questionnaire-9 (PHQ-9) and Depression Anxiety Stress Scale-42 (DASS-42) were used as outcome measures.
PHQ-9 is a multipurpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. It is a screening instrument with 9 items, developed to measure depression. For each item the patients are asked to assess how much they were bothered by the symptoms over the last two weeks. There are four answer options: not at all (0), several days (1), more than half of the days (2), and nearly every day (3). The sum score (range 0 to 27) indicates the degree of depression, with scores of ≥5, ≥10, and ≥15 representing mild, moderate, and severe levels of depression. It can also be administered repeatedly, which can reflect improvement or worsening of depression in response to treatment.
The DASS is a 42 item self-report inventory that yields 3 factors: Depression; Anxiety; and Stress. This measure proposes that physical anxiety and mental stress factor-out as two distinct domains. This screening and outcome measure reflects the past 7 days.

Data Analysis and Results

Table 1: Gender distribution of the participants

Gender	No of participants
Female	17
Male	13

Table 2: Age group of the participants

Age group	No of participants
40 – 50	12
50 – 60	18

Table 3: Comparison of severity of depression Pre and Post intervention according to Patient Health Questionnaire-9

PHQ-9	Mean ± SD	p value	t value
Pre-intervention	16.33 ± 5.195	<0.0001, extremely significant	11.566
Post-intervention	8.23 ± 2.967		

Result no. 3: On comparing the severity of depression, pre and post intervention according to Patient Health Questionnaire-9 using paired t test, t value is 11.566 with df= 29 and p value is <0.0001, extremely significant.

Table 4: Comparison of severity of depression Pre and Post intervention according to Depression Anxiety Stress Scale-42 (DASS-42).

Depression	Mean ± SD	p value	t value
Pre-intervention	23.766 ± 7.551	<0.0001, considered extremely significant.	8.029
Post-intervention	15.6 ± 4.924		

Result no. 4: Comparison of severity of depression, pre and post intervention according to Depression Anxiety Stress Scale-42, using paired t test shows t value is 8.029 with df= 29 and p value is <0.0001, extremely significant.

Table 5: Comparison of severity of anxiety of Pre and Post intervention using Depression Anxiety Stress Scale (DASS)

Anxiety	Mean ± SD	p value	t value
Pre-intervention	19.4 ± 5.568	<0.0001, considered extremely significant.	10.679
Post-intervention	10.6 ± 3.125		

Result no. 5: Comparison of severity of anxiety, pre and post intervention according to Depression Anxiety Stress Scale-42, using paired t test shows t value is 10.679 with df= 29 p value is < 0.0001, extremely significant.

Table 6: Comparison of severity of Stress between Pre and Post intervention using Depression Anxiety Stress Scale (DASS)

Stress	Mean ± SD	p value	t value
Pre-intervention	28.233 ± 6.431	<0.0001, considered extremely significant.	11.792
Post-intervention	14.633 ± 3.429		

Result no. 6: Comparison of severity of stress, pre and post intervention according to Depression Anxiety Stress Scale-42, using paired t test shows t value is 11.792 with df= 29 p value is < 0.0001, extremely significant.

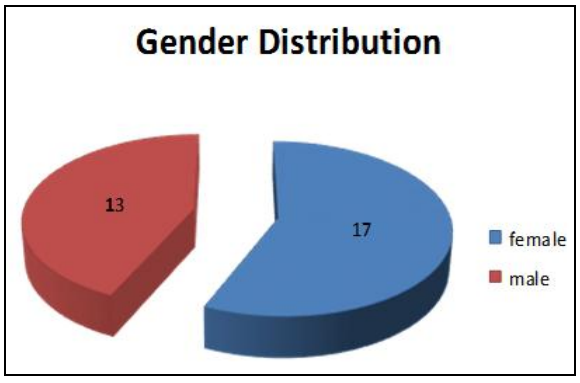

Fig 1: Represents the gender distribution of the participants.

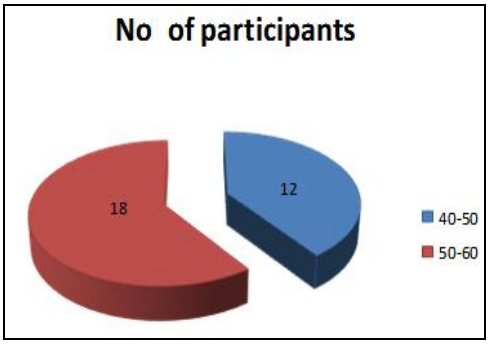

Fig 2: Represents number of the participants between the age group 40-60 years

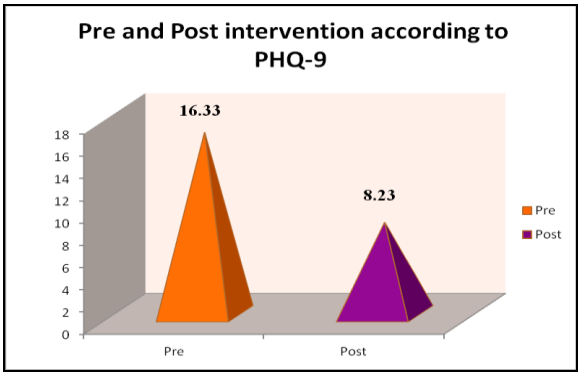

Fig 3: Represents comparison of severity of depression pre and post intervention by using Patient Health Questionnaire – 9.

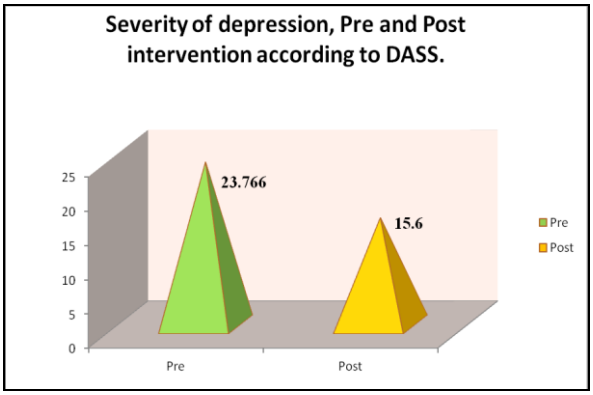

Fig 3: Represents comparison of severity of depression pre and post intervention using Depression Anxiety Stress Scale (DASS).

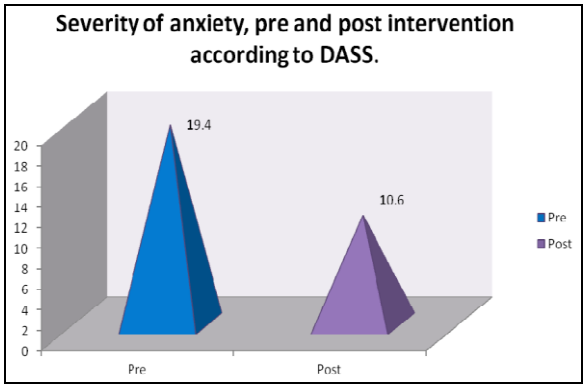

Fig 5: Represents comparison of level of anxiety pre and post intervention using Depression Anxiety Stress Scale (DASS).

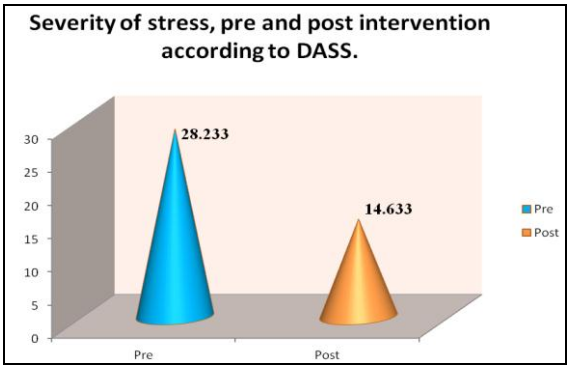

Fig 6: Represents comparison of severity of stress pre and post intervention using Depression Anxiety Stress Scale (DASS).

Discussion

The present study "A study on music therapy as a method of coping with depression in patients with cancer in Pravara Rural Hospital, Loni." was aimed at reducing the severity of depression thereby improving patients' Quality of Life. It was carried out in the OPD of Oncology and Radiotherapy Department of Pravara Rural Hospital, Loni. 30 participants of 40-60 years age group were given the intervention. In this study, severity of depression was the parameter used as the outcome measure which was assessed by using Patient Health Questionnaire-9 (PHQ-9) and Depression Anxiety Stress Scale – 42 (DASS-42). The main purpose of this study was to examine the effect of music therapy on severity depression in patients with cancer. According to the assessment using PHQ-9, the mean values of pre and post intervention are 16.33 and 8.23. Data were analyzed using student paired t test which reveals extremely significant difference in pre and post values. According to the assessment usingDASS-42, the mean values of severity of depression pre and post intervention are 23.766 and 15.6. Data were analyzed using student paired t test which reveals extremely significant difference in pre and post values. This reveals positive effects of music therapy on decreasing severity of depression in patients with cancer while improving patient's Quality of Life. Several studies have shown that music therapy has a significant impact on psychosocial well-being and Quality of Life. Several studies have shown that music therapy has a significant impact on psychosocial well-being and quality of life.

Music therapy improves respiratory patterns and lowers salivary cortisol levels and affects mu opiate receptor expression, morphine- 6 glucuronide, and interleukin-6 levels that may be mediated by nitric oxide thus benefiting patients physiologically, psychologically, and socio emotionally. Physiologic changes like neuronal activity in the lateral temporal lobe and in cortical areas devoted to movement are also entrained by music. It decreases tension level and makes patients share comments about how music affected their mood like "relaxed and uplifted," "soothing and relaxing," "calmed my nerves," and "felt calm and happy".[7]

Conclusion

From our study, it can be concluded that 4 weeks of music therapy improved quality of life and mental health in patients with cancer by reducing the severity of depression, anxiety and stress. Hence, music therapy can be included in the treatment of patients with cancer or in any severely ill patient adjunct to medical treatment. If it is implemented in the daily clinical practice, it would be beneficial for the patients and their families or caregivers to maintain good mood and to keep them distracted from unpleasant symptoms. This study supports alternative hypothesis and rejects null hypothesis.

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