# Effect of Music Therapy on Pain and Anxiety Levels of Cancer Patients: A Pilot Study

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## ABSTRACT

**Background:** The pain associated with cancer is highly detrimental to the quality of life of the affected individuals. It also contributes to the anxiety of the patient. There is a need for a nonpharmacological approach in addition to the pharmacological therapy for the management of the pain for a more holistic improvement in the individual. With this study, we wish to achieve this through music.

**Objective:** To assess the effect of music therapy on pain scores and anxiety levels of cancer patients with pain.

**Study Design:** In this quantitative study, a comparative study was done on fourteen cancer patients admitted for pain relief under the Department of Pain and Palliative Medicine, of a tertiary care hospital, having moderate to severe pain (numerical pain rating scale [NRS] - of 4 to 10).

**Subjects and Methods:** Convenience sampling was used. Patients were allocated to test group or control group nonrandomly. The test group patients were subjected to music therapy for 20 min while the control group patients were kept occupied by talking to them for 20 min. The NRS scale was used to assess the pre- and post-interventional pain scores and the Hamilton anxiety rating scale was used to assess the pre- and post-interventional anxiety scores in the two groups.

**Statistics:** Student's *t*-test was used for comparing the pre- and post-interventional data. Two sample *t*-test was used to compare the data obtained from the control and study groups.

**Results:** Statistically significant reduction seen in the pain scores in the test group after music therapy ($P = 0.003$). No statistically significant reduction seen in the pain score in the control group ($P = 0.356$). There was a statistically significant reduction in the postintervention pain scores in the test group compared to the control group ($P = 0.034$). The reduction in anxiety levels in both groups after intervention was not statistically significant.

**Conclusion:** Music therapy was found to lower the pain score of a patient who had received standard palliative care for pain reduction. It was also more effective than the act of talking in reducing the pain score. A study with a larger sample size should be undertaken to conclude that, music therapy can be used in addition to morphine and other painkillers to reduce pain as a part of a more holistic approach to palliative care strategies.

**Key words:** Anxiety, Cancer pain, Music

## INTRODUCTION

Pain often develops as cancers progress. This pain increases in severity over time and eventually enhances the disease associated psychological and physiological deterioration.[1] The quality of life of the individual is also impaired.[2,3] Although there have been some remarkable advances with respect to the pharmacological management of pain, there is a need for a more holistic

Access this article online

Quick Response Code:

Website: www.jpalliativecare.com

DOI: 10.4103/0973-1075.185042



**How to cite this article:** Krishnaswamy P, Nair S. Effect of music therapy on pain and anxiety levels of cancer patients: A pilot study. Indian J Palliat Care 2016;22:307-11.

approach in pain management which will help integrate all aspects of health-physical, mental, spiritual, and emotional.[4,5,6]

Music has for a long time been believed to have therapeutic effects.[7] It is also believed to reduce pain and anxiety. If this music therapy can also reduce cancer-associated pain and anxiety, then it can serve as a cost-effective approach to palliation in addition to pharmacological measures.[6-19] However, the studies done to this effect had all been done overseas in developed countries such as the United States and the United Kingdom.[6-19] Hence, it was necessary to do a study regarding music therapy in India as the perceptions of the people regarding healthcare and music would be different here compared to the developed countries due to cultural, economic factors, and social factors.[20] Thus, there was a need to look into effect and the application of this form of therapy in reducing the pain and anxiety levels of Indian cancer patients. We aimed to do this through our study.

Thus, the primary objective of our study was to assess the effect of music therapy on pain relief in patients with cancer pain.

Our secondary objective was to assess the effect of music therapy on anxiety levels of patients with cancer pain.

## SUBJECTS AND METHODS

The study design was a comparative study. The inclusion criteria for selection of subjects were cancer patients admitted for pain relief under the Department of Pain and Palliative Medicine, of a tertiary care hospital having moderate to severe pain (numerical pain rating scale [NRS] - 4–10) administered morphine 3 h prior to the intervention. The exclusion criteria (having included) were all patients with hearing deficits and those with metastases to the brain.

The music that was selected was instrumental music - Veena and Flute, which had a combination of the traditional Indian raga Anandabhairavi (which is believed to have therapeutic effects) and modern contemporary tunes.[21,22]

The scales used for the assessment of pain and anxiety were:

- NRS - To assess the pain level on a scale of 1–10 [Figure 1].[23-27]
- Hamilton anxiety rating scale (HAM-A) – Used to assess the anxiety levels based on scores obtained from 14 different criteria. Each item is scored on a scale of 0 (not present) to 4 (severe), with a total score range of 0–56, where <17 indicates mild severity, 18–24 mild to moderate severity, and 25–30 moderate to severe.[28,29]

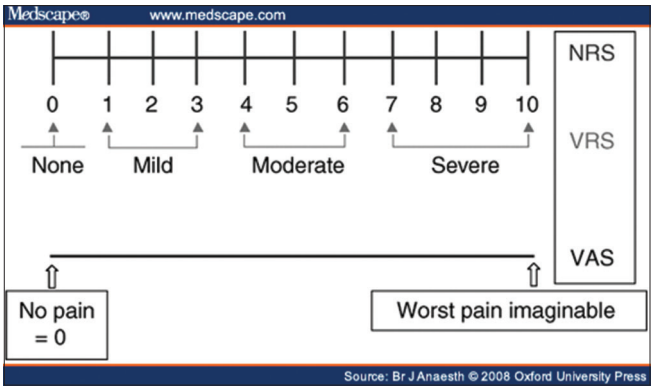



**Figure 1:** Numerical pain rating scale

Sampling method - convenience sampling used.

An informed consent was taken from the subjects after which they were allocated into two groups - the study group and control group nonrandomly.

The preintervention (baseline) NRS and HAM-A scores were recorded in both the groups.

### The intervention

The subjects in the study group were then subjected to 20 min of music which was administered by means of headphones connected to an MP3 player in which the music was stored. All the subjects were made to listen to the same pieces of music. The subjects in the control group were kept occupied for 20 min by the act of talking to them.

The postintervention NRS and HAM-A scores were recorded in both groups.

The data obtained was analyzed.

## RESULTS

### Demographics

A total of 14 subjects were included of whom 7 were allocated to the study group and 7 into the control group. The study group had 5 females and 2 males while the control group had 3 females and 4 males.

### Analysis

Student's *t*-test was used for comparing the pre- and post-interventional data. Two sample *t*-test was used to

compare the data obtained from the control and study groups.

### In the study group

The mean preintervention pain score was 5.43 ± 1.27 and the postintervention (music) pain score was 4.00 ± 1.29. The decrease in the pain scores was by 1.43 ± 0.78 with a $P = 0.003$ which was statistically significant [Table 1 and Graph 1].

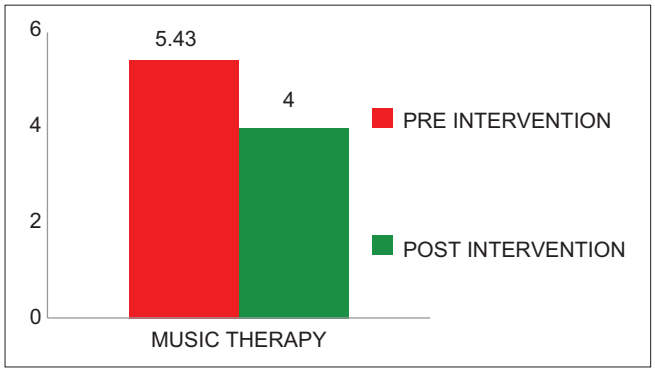
The difference between the postintervention pain score of the study group (music) and control group (talking) was − 1.71 ± 0.71 with a $P = 0.034$ which was statistically significant [Table 2 and Graph 2].

**Table 1: Postmusic pain score compared to preintervention pain score**

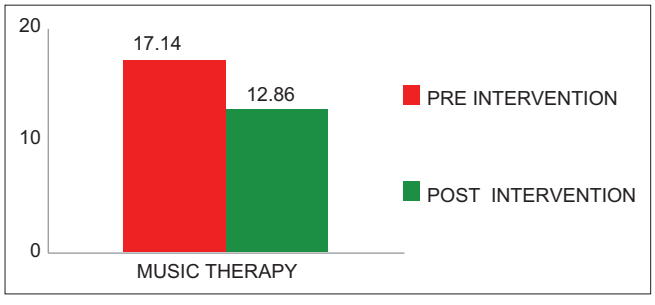
| | Mean pain score | *P* |
|---|---|---|
| Preintervention | 5.43±1.27 | 0.003 |
| Postintervention | 4.00±1.29 | Mean difference=1.43±0.78 |

**Table 2: Pain scores in the test group (music) compared to the control group**

| Intervention | Mean pain score | *P* |
|---|---|---|
| Test | 4.00±1.29 | 0.034 |
| Control | 5.71±1.38 | Mean difference=−1.71±0.71 |




**Graph 1:** Post music pain score compared to preintervention




**Graph 3:** Anxiety levels after music therapy compared to before intervention

The mean preintervention HAM-A score was 17.14 ± 1.38 and the postintervention HAM-A score was 12.86 ± 0.95. The decrease in the HAM-A score was 4.28 ± 0.53 with a $P = 0.078$ which was not statistically significant [Table 3 and Graph 3].

### In the control group

The mean preintervention pain score in the control group was 5.86 ± 1.21 and the mean postintervention (talking) pain score was 5.71 ± 1.38. The decrease in the pain score was 0.14 ± 0.38 with a $P = 0.356$ which was not statistically significant [Table 4 and Graph 4].

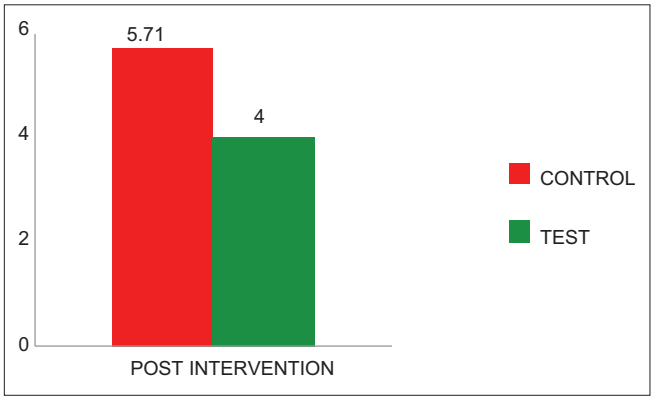
The mean preintervention HAM-A score was 25.71 ± 1.51 and the mean postintervention (talking) HAM-A score was

**Table 3: Anxiety levels after music therapy compared to before intervention**

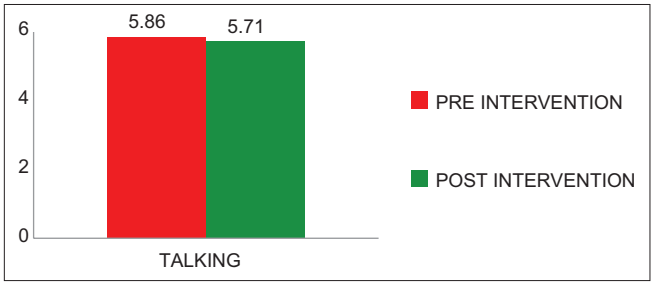
| | Mean anxiety score | *P* |
|---|---|---|
| Preintervention | 17.14±1.38 | 0.078 |
| Postintervention | 12.86±0.95 | Mean difference=4.28±0.53 |

**Table 4: Post-talk pain score compared to preintervention**

| | Mean pain score | *P* |
|---|---|---|
| Preintervention | 5.86±1.21 | 0.356 |
| Postintervention | 5.71±1.38 | Mean difference=0.14±0.38 |




**Graph 2:** Pain scores in the test group (music) compared to the control group




**Graph 4:** Post-talk pain score compared to preintervention

21.43 ± 1.21. The decrease in the score postintervention was 4.28 ± 0.30 with a $P = 0.200$ which was not statistically significant [Table 5 and Graph 5].

## DISCUSSION

Our study has shown that music therapy caused a significant reduction in the pain score of patients already on morphine. The reduction in pain was significantly more after music therapy than after the act of talking to the patients. Neither music therapy nor the act of talking significantly reduced the anxiety levels of the patients. Our pilot study, therefore, has shown that music therapy can reduce cancer pain.

Our results are in concurrence with the below-mentioned studies. However, unlike the other studies, in our study, no statistically significant reduction in the anxiety levels of patients in both groups post the intervention was found.

A positive effect with music therapy was found by Horne-Thompson and Grocke, through a randomized control trial involving twenty-five participants, where the anxiety levels of the subjects were measured after a single session using the Edmonton Symptom Assessment System (ESAS). The investigators found a significant reduction in anxiety in the experimental group ($P = 0.005$) and significant reductions in other measurements on the ESAS in the experimental group, specifically pain ($P = 0.019$), tiredness ($P = 0.024$), and drowsiness ($P = 0.018$).[8]

Gallagher *et al.* reported the effects of music therapy on two hundred patients as a significant improvement in the facial expressions, mood and verbalization of the patients ($P < 0.001$). Most patients and families had a positive subjective and objective response to music therapy.[9]

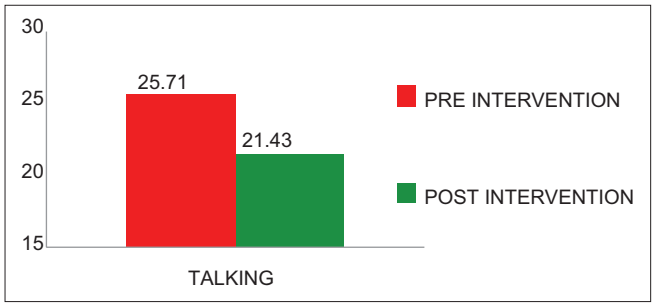
In another randomized trial (performed by Huang *et al.*) in which the patients were made to listen to music of their own choice, a significant reduction in pain experienced by the patients was seen postmusic therapy ($P < 0.001$).[10]

Hilliard showed that there was a significant improvement in the quality of life among the terminally ill who were subjected to a single session of music therapy through a randomized control trial on eighty. Furthermore, the more music therapy sessions participants received, the higher the quality of life, even as their physical health declined. This was not the case in the control group, where the quality of life declined as physical status declined. The study supports the idea that live music therapy sessions increase perceived quality of life for people with terminal cancer, and that sessions should be provided with a relatively high frequency since the quality of life increased with each music therapy session.[11]

Music therapy, therefore, should be further looked into using studies with a larger sample size with randomization in its application in the management of cancer pain in addition to morphine and other painkillers, as a part of a more holistic approach to palliative care strategies. Future studies exploring the effect of more number of music sessions, different durations of music and different types of music on cancer pain can be done. Furthermore, the acceptability of this form of therapy among patients and the methods by which this therapy can be incorporated into routine palliative cancer care should be explored.

**Table 5: Anxiety levels after talking compared to before intervention**

| | Mean anxiety score | *P* |
|---|---|---|
| Preintervention | 25.71±1.51 | 0.200 |
| Postintervention | 21.43±1.21 | Mean difference=4.28±0.30 |




**Graph 5:** Anxiety levels after talking compared to before intervention

## CONCLUSION

A single session of music therapy is effective in significantly reducing cancer pain when used along with standard palliative care in cancer patients with moderate to severe pain. Music therapy can, therefore, be considered as a nonpharmacological method of reducing cancer pain.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

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