



# A STUDY TO ASSESS THE EFFECTIVENESS OF MUSIC THERAPY ON SLEEP AMONG HOSPITALIZED CHILDREN IN SELECTED HOSPITAL, BENAGLURU

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## *Abstract :*

Children in hospitals frequently experience trouble sleeping due to factors such as stress, pain, and changes in their environment. This quasi-experimental study set out to determine whether children hospitalized in certain Bengaluru hospitals could benefit from music therapy, more especially guided imagery relaxation set to recorded piano music, in terms of getting a better night's rest. A total of sixty children, ranging in severity from moderate to severe, were randomly selected and split evenly between an experimental and control group. The participants' sleep duration was recorded using a structured sleep scale both before and after the test. Ten days of music therapy were administered to the experimental group, while the control group underwent standard care without music intervention. After the intervention, 66.7% of the children in the experimental group reported only mild sleep disturbances, down from 13.3% before the intervention, demonstrating a statistically significant improvement in sleep disturbance scores. The results of the statistical analysis showed that the quality of sleep significantly improved after the intervention ( $t = 13.05$ ,  $p < 0.05$ ) and that there was a significant difference in the post-test scores of the experimental and control groups ( $t = 3.2$ ,  $p < 0.05$ ). Physical and physiological sleep manifestations showed the most improvement when analyzed area-wise. There were no statistically significant correlations between the demographic variables and the improvement in sleep quality. Regardless of demographic differences, the study found that music therapy was an effective non-pharmacological intervention to enhance sleep in hospitalized children.

**Keywords:** Music therapy, hospitalized children, guided imagery, non-pharmacological intervention, pediatric care, quasi-experimental study.

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## I. INTRODUCTION

The physiological activity of the brain regions involved in consciousness is periodically depressed during normal sleep, which allows a person to be awakened. A person can be easily roused from sleep to consciousness or wakefulness by cerebral arousal, which can be triggered by pain or unfamiliar sounds. The reticular activating system's ability to screen discrimination is demonstrated by the return to wakefulness[1]. The practical use of music to achieve particular therapeutic objectives is known as music-therapy. In the late 19th century, physicians began to recognize the therapeutic potential of sound. It is believed that sound, which vibrates in waves at various frequencies, affects not only the emotions but also specific physiological processes like breathing and heart rate[2]. In addition to having a profound effect on hearing, sound instruments can help the body regain equilibrium and encourage self-healing. Michigan State University established the world's first music therapy degree program in 1944[3]. Over the past three decades, there have been significant and ongoing changes to the concepts of music therapy in the field of mental health. Music therapy is a relatively new form of therapy that uses music to promote healing.[4] The concept of music as a therapeutic force that influences behavior and health dates back at least as far as Aristotle and Plato's writings. The behavioral science that studies the systematic use of music to induce relaxation and desired changes in emotions, behaviors, and physiology is known as music therapy.[5] Both making and listening to music are part of music therapy. Each person chooses the music they want to listen to. D. Aldridge states that there are two main approaches to music therapy: active music therapy, which involves the patient or group of patients singing or playing an instrument with the therapist, and passive music therapy, in which the patient or group of patients listens to the therapist play music, either live or recorded[6]. The music used in active therapy is frequently improvised to fit the needs of each patient. The music used in passive therapy is frequently selected to fit the needs of specific patients. Major stressors associated with hospitalization for children include pain, physical injury, loss of control, and separation.[7] Their developmental stage, prior experiences with illness, separation, or hospitalization, their natural and learned coping mechanisms, the gravity of the diagnosis, and the support network all affect how children respond to these crises. According to studies, music therapy reduces physiological pain, stress, and anxiety by causing a relaxation response and taking the focus off of the discomfort. Music therapy uses all types of music. Using music to help people with illnesses and disabilities with their social, mental, physical, and cognitive needs.[8] Music therapy is used to combat depression and improve patients' moods. Movement is encouraged by music as part of physical rehabilitation. For the purpose of relaxation, slow music is used to reduce muscle tension and combat anxiety. The medical and nursing press has reviewed music therapy. The main focus is on music's calming properties and its importance as a counterbalance to an overly technological medical approach.

## II. OBJECTIVES

The objectives of the study are to:

- To assess the pre test level of sleep among hospitalized children.
- To assess the post test level of sleep among hospitalized children.
- To compare the pre test and post test level of sleep among hospitalized children.
- To find significant association between music therapy and demographic variables.
- To evaluate the effect of music therapy on sleep.

## III. Hypotheses

The hypotheses will be tested at 0.05 level of significance.

- **H<sub>01</sub>** - There is no significant difference between the mean post-test sleep score and mean pre-test sleep score of the experimental group.
- **H<sub>02</sub>** - There is no significant difference between the means sleep scores of experimental groups and control group after music therapy.
- **H<sub>03</sub>** : There is no significant association between pre-test level of sleep and selected demographic variables.

## IV. Operational definitions

- **Music therapy:** Listening recorded piano music produces auditory relaxation that radiate to muscles and brain.
- **Hospitalised child:** Child who is admitted in the hospital for 3days treatment.
- **Sleep:** A condition of body and mind which typically recurs for several hours..

## V. REVIEW OF LITERATURE

Review of literature is a critical summary of research on a topic of interest generally prepared to put a research problem in proper context or to identify gaps and weakness on previous studies to justify a new investigation[9].

Deshmukh et al. demonstrated in a preliminary study that, similar to hypnotic drugs, listening to classical music utilizing chosen ragas improved sleep quality and decreased depressive symptoms in patients suffering from major depression. The positive effects continued even after the treatment ended, which points to music as a potential supportive therapy for depression management and better sleep[10].

Susan .G. Komen conducted a group study on grieving children may benefit from a group music therapy programme interns of both improved mood and reduced problematic behaviour in hospital. The relaxation

response is a physiological state that speeds up many of the bodily's healing responses. Music therapy has been shown to cause relaxation[11].

According to Dr. T. Mythily's research, children who receive active music therapy experience less hyperactivity, better sleep, and increased speech fluency. Additionally, it improves verbal memory and treats behavioral issues and developmental delays, making it a useful tool in pediatric care, particularly for kids with speech impairments and other developmental obstacles[12].

According to D Aldridge conducted a standard study within the hospital settings for the management of the mentally handicapped children. Music therapy is accepted as a valid therapeutic treatment for children[13].

## VI. METHODOLOGY

### Research approach

The study critically examines natural phenomena using an analytical and methodical approach. In light of the study's goals, an evaluative approach was judged appropriate to determine whether music therapy helped hospitalized children in a few Bengaluru hospitals sleep better.

### Research design

The study assessed the impact of music therapy on children's sleep in a hospital in Bengaluru using a quasi-experimental pre-test post-test control group design. On day one, sleep levels were measured; on day two, the experimental group received music therapy; and on day twelve, post-tests were administered to both groups.

This can be represented as:

	<b>Phase – 1</b>	<b>Phase – 2</b>	<b>Phase – 3</b>	<b>Phase – 4</b>
<b>Sample</b>	<b>Pre-test (O<sub>1</sub>)</b>	<b>Treatment (R)</b>	<b>Post-test (O<sub>2</sub>)</b>	<b>Effectiveness (E)</b>
Experimental group	Assessment of sleep by using observational checklist.	Administration of music therapy for increases the sleep.	Assessment of observational checklist.	$E=O_2-O_1$
Control group	Assessment of sleep by using observational checklist.		Assessment of observational checklist.	$E=O_2-O_1$

## Variables

Variables are traits that can change from one group of people to another. Because it is not dependent on anything else, music therapy serves as the study's independent variable. The level of sleep among hospitalized children is the dependent variable that is affected by music therapy. Gender, standard, religious affiliation, family structure, birth order, household income, and living conditions are all examples of demographic variables.

## Population

Population is the set of people or entities to which the results of a research are to be generalized. Hospitalized children who are studying in tenth standard in a Selected hospitals at Bengaluru.

## Sampling procedure

Sampling involves choosing a group, event, or portion of the population to represent the whole. All hospitalized children were given a baseline sleep proforma for mild, moderate, and severe sleep. Purposive sampling selected 30 moderate-to-severe sleepers in the experimental and control groups.

## Sample and sample size

A finite subject of the population selected from it with the objectives of investigating its properties is called a sample. The sample for the present study consisted of 60 Hospitalized children in (30 in experimental and 30 in control group) who met the inclusion criteria.

## Sampling criteria

The inclusion criteria for the study are hospitalized children with moderate to severe sleep issues, those willing to participate, and those present on the study day. The exclusion criteria include children who have prior exposure to relaxation techniques or have respiratory or spinal problems.

## Data collection technique

In this study, researcher used a tool to collect the relevant data. It was children sleep scale.

## Development of the tool

Expert consultation with a guide, subject specialists, and psychologists ensured accuracy during the development of a tool to assess sleep levels in hospitalized children. The process also included reviewing relevant literature and preparing blueprints.

## Description of the tool

The tool is divided into two parts,

**Tool I :** It includes questions on demographic profile of the subjects.

**Tool II :** Tool to assess the severity of sleep level among Hospitalized children. This is a 5 point scale with 30 items. The minimum score is 30 and maximum score is 150.

### Development criteria for scoring

The study's goals necessitated consulting a statistician, the research guide, and area experts in order to classify the sample according to their sleep duration. According to their suggestions, minor sleep disturbances were indicated by sleep scores between 30 and 52, moderate sleep disturbances by scores between 53 and 104, and severe sleep disturbances by scores between 105 and 150.

### Data collection procedure

Participants' prior consent and ethical approval were obtained before data collection began. Purposive sampling was used to choose thirty hospitalized kids with moderate to severe sleep problems. The experimental group received ten days of instruction in guided imagery relaxation. Using the same sleep scale, a post-test was administered on day twelve.

### Plan for data Analysis

Inferential and descriptive statistics were used to analyze the data. Sleep levels before and after music therapy were evaluated using range, mean, median, and standard deviation, while sample characteristics were measured using frequency and percentage. Sleep score associations and differences between groups were assessed using chi-square, paired, and unpaired t-tests.

## VII. RESULTS

### Part I: Description of demographic characteristics of the sample.

This section deals with description of sample characteristics, frequency and percentage of experimental and control group presented in Table 1.

S.No.	Demographic variables	Experimentalgroup		Control group	
		f	%	f	%
1.	<b>Gender</b>				
	a. Male	4	13.4	5	16.7
	b. Female	26	86.6	25	83.3
2.	<b>Religion</b>				
	a. Hindu	15	50.0	16	53.3

	b. Christian	10	33.3	9	30.0
	c. Muslim	5	16.7	5	16.7
	d. Others	0	0.0	0	0.0
3.	<b>Type of family</b>				
	a. Nuclear	20	66.6	22	73.3
	b. Joint	5	16.7	5	16.7
	c. Extended	5	16.7	3	10.0
4.	<b>Birth order</b>				
	a. First	15	50.0	14	46.6
	b. Second	10	33.3	11	36.6
	c. Third	3	10.0	3	10.0
	d. Fourth	2	6.7	2	6.7
	e. If more than four, specify	0	0.0	0	0.0
5.	<b>Monthly income</b>				
	a. <5,000	15	50.0	10	33.3
	b. 5,001-10,000	5	24.0	12	40.0
	c. 10,001-15,000	2	26.0	5	21.0
	d. 15,001-20,000	0	0.0	2	6.7
	e. >20,000	0	0.0	0	0.0
6.	<b>Living with</b>				
	a. Parents	27	90.0	28	93.3
	b. Hostel	3	10.0	2	6.7
	c. Grandparents	0	0.0	0	0.0

Table 1 indicates that all participants are from both experimental and control groups. Females were highest (86.6% experimental, 83.3% control). Most (50% experimental, 53.3% control) were Hindu. Hospitalized children were mostly nuclear families (73.3% in control and 66.6% in experimental groups). The majority of samples (50% experimental and 46.6% control) were first-borns. The majority of samples (50% experimental

and 40% control) came from families earning 5001–10000 rupees. Highest percentage of hospitalized children live with parents (90% experimental and 93.3% control).

## Part II: Level of sleep level among Hospitalized children in experimental and control group

This part deals with assessment of existing sleep. Level of sleep can be assessed by using sleep scale.

### Assessment of level of sleep level among Hospitalized children in experimental and control group

Level of sleep was assessed by using modified childrens sleep scale and was analysed using descriptive statistics as presented in Table 2 and figure 1

**Table 2: Frequency and percentage distribution of level of sleep level problem among Hospitalized children in experimental and control group n=30**

Level of sleep	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Mild	4	13.3	5	16.6
Moderate	16	53.3	15	50.0
Severe	10	33.4	10	33.4

Data in the Table 2 and Figure 3 shows that most (53.3% in experimental group and 50% in control group) of the Hospitalized children are having moderate sleep whereas lowest (33.4% in both experimental and control group) were having severe sleep.

## Part III: Effectiveness of music therapy on sleep

This part deals with frequency and percentage distribution of sample according to the level of sleep and also range, mean, mean difference, median, SD and 't' value of pre-test and post –test score and comparison of level of sleep in the pre-test with post-test along with effectiveness of the study.

### Section A: Comparison of level of sleep with pre-test and post-test score of experimental group

To compare the pre-test and post-test score of the experimental group, frequency and percentage distribution of the sample according level of sleep in experimental group is calculated.

**Table 3: Frequency and percentage distribution of the sample according to the level of sleep in experimental group based on pre-test and post-test n=30**

Level of sleep	Pre-test		Post-test	
	Frequency	Percentage	Frequency	Percentage
Mild	4	13.0	20	66.7
Moderate	16	53.3	10	33.3
Severe	10	33.4	0	0.0

Table 3 and Figure 4 show that 33.4% of children had severe pre-test sleep and no post-test sleep. Pre-test 53.3% of children had moderate sleep, post-test 33.3%, and 13.3% had mild sleep, 66.7% had mild sleep.

### Section B: Range, mean, median, mean score, mean difference, SD and 't' value of pre-test and post-test sleep scores of experimental group

To compare the pre-test and post-test sleep score paired 't' test was used. In order to test the statistical significance the following null hypothesis was stated.

**H01 :** There is no significant difference between the mean post-test sleep score and mean pre-test sleep score of the experimental group.

**Table 4: Range, mean, median, mean score, mean difference, SD and 't' value of pre-test and post-test sleep scores of experimental group (n = 30)**

Test	Range of score	Mean	Median	SD	Mean difference	't' value
Pre-test	62-106	53.67	70.0	17.56	12	13.05
Post-test	40-67	43.70	50.3	13.70		

The data shows that in the experimental group the mean post- test score ( $43.7 \pm 13.7$ ) was less than that of mean pre- test score ( $53.67 \pm 17.56$ ). The calculated t value ( $t_{29} = 13.05$ ) is greater than the table value ( $t_{29} = 2.045$ ) at 0.05 level of significance. Hence null hypothesis was rejected.

### Section C: Comparison of post –test sleep scores of children in experimental and control group

To compare the post-test scores of experimental and control group, frequency and percentage distribution of sample according to the level of sleep scores in control group is calculated

**Table 5: Frequency and Percentage distribution of sample according to the post- test sleep scores in experimental and control group** **N = 60**

Level of sleep	Experimental group		Control group	
	Frequency	Percentage	Frequency	Percentage
Mild	20	66.7	6	20.0
Moderate	10	33.3	14	46.6
Severe	0	0.0	10	33.4

Data in Table 5 and Figure 6 shows that in the post-test of experimental group 66.7% had mild sleep 33.3% had moderate sleep and no one had severe sleep whereas in the control group 20% of the children had mild sleep 46.6% had moderate sleep and 33.4% had severe sleep.

#### **Section D: Mean, SD, mean difference and ‘t’ value of post-test score in experimental group and control group**

To test the statistical significance between the post-test sleep scores of experimental and control groups unpaired “t” test was computed and the following null hypothesis was stated.

**H<sub>02</sub>** : There is no significant difference between the means sleep scores of experimental groups and control group after music therapy.

**Table 6: Mean, SD, mean difference and ‘t’ value of post-test score in experimental group and control group** **N = 60**

Group	Mean score	SD	Mean difference	‘t’ value
Experimental group	43.70	17.56	13.45	3.2
Control group	57.13	18.40		

Data in Table 6 shows that the mean post-test sleep score ( $43.7 \pm 17.56$ ) in experimental group is lower than the mean pre-test score ( $57.13 \pm 18.4$ ) in control group after music therapy. The calculated t value ( $t_{58}=3.2$ ) is greater than the table t value ( $t_{58}=1.96$ ) at 0.05 level of significance. Hence the null hypothesis was rejected. This shows guided imagery relaxation technique was effective in sleep among children.

### Section E: Area-wise mean pre-test and post-test sleep scores among children in experimental group

To determine the significant difference in the area wise mean pre-test and post-test sleep score, area wise mean, mean%, standard deviation of pre-test and post- test scores in experimental group was computed between each area and presented in the Table 7.

**Table 7: Area wise mean, mean%, standard deviation of pre-test and post-test scores in experimental group** **n=30**

Sleep manifestations	Pre-test(B)			Post-test(A)			Effectiveness (B-A)		
	Mean	SD	Mean%	Mean	SD	Mean%	Mean	SD	Mean%
Physiological	10.8	5.20	24.50	9.2	4.70	15.20	1.6	0.50	9.30
Physical	6.6	2.30	27.50	4.8	1.80	12.50	1.8	0.50	15.00
Emotional	12.2	5.16	27.70	11.3	5.00	14.50	0.9	0.16	13.00
Social	6.2	1.30	31.00	5.9	0.80	30.00	0.3	0.50	1.00
Examination	3.5	1.20	29.00	3.3	1.10	27.50	0.2	0.10	1.50
Behavioural	4.2	1.38	35.00	3.7	1.28	30.80	0.5	0.10	4.20
Total	43.5	3.28	29.14	38.2	2.90	21.75	5.3	1.86	44.00

According to Table 7, sleep was considerably enhanced by guided imagery relaxation, which resulted in a 44% decrease in overall scores. The greatest improvements occurred in physical manifestations (15%) and physiological manifestations (9.3%). Smaller improvements were seen in the behavioral, social, emotional, and examination domains. Sleep quality improved to mild-to-moderate levels after the test, with the most noticeable change being in physical manifestation.

### Part IV: Association of pre-test level of sleep with selected demographic variables

To test the association between pre-test sleep score and selected demographic variables, Chi-square test was used and following null hypothesis was stated.

**H<sub>03</sub>** : There is no significant association between pre-test level of sleep and selected demographic variables.

**Table 8: Association of pre-test level of sleep with demographic variables****N=60**

Demographic characteristics	df	$\chi^2$	Inference
Age of Hospitalized children	1	0.950	Not significant
Gender	1	0.223	Not significant
Religion	1	0.614	Not significant
Type of family	1	0.715	Not significant
Birth order	1	0.823	Not significant
Living with	1	0.232	Not significant

(Table value of chi-square at 1 df with 5% level=3.84)

Data presented in Table 8 reveals that calculated chi-square value is less than table value (3.84) at 0.05 level of significance. Hence the null hypothesis can be accepted and concluded that there was no significance association between pre-test level of sleep with demographic variables.

## DISCUSSION

This study examined the effects of music therapy on sleep in Bengaluru hospitals' hospitalized children. The 60-person quasi-experimental pre-test post-test control group study included 30 children in each group. The study shows that music therapy significantly improves hospitalized children's sleep. In the experimental group, post-test sleep levels changed significantly. Before the intervention, 33.4% of children had severe sleep problems, 53.3% moderate, and 13.3% mild. No children had severe sleep problems after music therapy, 33.3% had moderate, and 66.7% had mild. The study found that music therapy significantly improved children's sleep quality (paired t value = 13.05,  $p < 0.05$ ). The control group never received the intervention and showed little sleep improvement. After the post-test, 33.4% of children had severe sleep problems, 46.6% moderate, and 20% mild. No severe cases occurred in the experimental group after intervention, proving music therapy's efficacy. An unpaired t test comparing experimental and control group post-test scores confirmed music therapy's impact. Experimental group had significantly lower mean sleep score ( $43.7 \pm 17.56$ ) compared to control group ( $57.13 \pm 18.4$ ), with a calculated t value of 3.2 ( $p < 0.05$ ). This confirms that music therapy improved sleep. Music therapy improves physical (15%) and physiological (9.3%) symptoms of poor sleep, according to area-wise analysis. Although less so, emotional, social, behavioral, and exam-related areas improved. In previous research, Deshmukh et al. and Dr. Mythily found that music interventions improved sleep and behavior in children. The study also found no significant association between pre-test sleep levels and demographic variables like age, gender, religion, family type, birth order, or living conditions, as the chi-square values were below 3.84 at a 0.05 level of significance. This suggests that music therapy is beneficial to all hospitalized children regardless of demographics.

## CONCLUSION

The goal of the current study was to evaluate how well music therapy affected the sleep of children in hospitals. The results showed that children in the experimental group had significantly better sleep quality than those in the control group when they received music therapy, specifically guided imagery relaxation accompanied by piano music. The effectiveness of the intervention was demonstrated by the post-test results, which showed a noticeable change from moderate and severe sleep disturbances to mild levels. Following the use of music therapy, statistical analysis using paired and unpaired t-tests revealed a highly significant decrease in sleep disturbance scores. Furthermore, area-wise analysis showed that the biggest gains were observed in the physiological and physical signs of sleep. Sleep levels and demographic factors did not, however, significantly correlate, indicating that music therapy is generally beneficial for a variety of child populations.

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