



Effect of Music Therapy in Reducing Stress and Anxiety among Hospitalized Children in Selected Hospital-A Pilot Study

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Abstract Background: Hospitalization is a stressful experience for the child and can result in serving increased levels of anxiety and emotional distress. Non-pharmacological interventions such as music therapy have become important for promoting psychological wellbeing and support emotional adjustment in hospitals among children. **Aim:** The aim of this study is to determine the effectiveness of music therapy in the reduction of stress and anxiety in hospitalized children aged 6-12 years. **Methods:** The research design of a quantitative true experimental pre-test and post-test research design was adopted. The research was carried out in the pediatric department of a selected hospital. A total of 10 children were chosen by means of a simple random sampling method and assigned to experimental and control group. The experimental group received music therapy intervention and the control group received routine care. Stress and anxiety levels were measured before and after the intervention using standardized measures. Data were analyzed with the help of descriptive and inferential statistics. **Results:** In experimental group, a significant reduction in the mean stress scores was observed between the pre-test and post-test and the difference was found to be statistically significant ($t = 11.45, p < 0.001$). The mean anxiety scores also showed a statistically significant decrease ($t = 11.05, p < 0.001$). No major changes were seen in the control group. Post-test findings showed a significant change in perception to low anxiety and moderate levels of stress in cases of the experimental group. **Conclusion:** The results of the study indicated that music therapy had a potential to be an effective non-pharmacological approach to reduce stress and anxiety in children in the hospital. The results imply that the use of music therapy in pediatric care could potentially enhance emotional well-being but larger studies are necessary to substantiate the effectiveness thereof and justify routine clinical use.

Key Words Music Therapy, Hospitalized Children, Anxiety, Stress, Non-Pharmacological Intervention, Pediatrics Care

INTRODUCTION

Music therapy as a non-pharmacological intervention has become important in improving psychological wellness or psychological wellbeing especially among the vulnerable populations such as children in hospital. Music therapy is built on an idea that music experience can promote mental, emotional and physical healing. Music therapy has effects on the limbic system and auditory cortex that governs emotion and stress. It has the ability to suppress Hypothalamic–Pituitary–Adrenal (HPA) axis and sympathetic nervous system activation, resulting in a reduced level of cortisol and increased parasympathetic (vagal) activity. The evidence refers to music therapy modulating the functioning of the brain and emotions in such a way that stress and anxiety levels decrease in the hospital environment. Previous studies have found that music therapy is an effective treatment for

symptoms of anxiety and depression in a variety of clinical settings including pediatrics [1,2].

Children's reaction to anxiety depends on their developmental level. Younger children tend to show anxiety in their behavior and physical symptoms, while older children tend to verbalize their anxieties and anticipate medical procedures. Furthermore, hospitalization can be stressful to children themselves, due to unfamiliar surroundings, disruptive procedures and disconnection from family. These are conditions that can make it worse for anybody to have feelings of anxiety and fear and so the need for effective interventions is of the utmost importance. Something which is characterized by its versatility of applications ranging from active participation in music to passive listening to music, music therapy has been documented as creating a calming atmosphere suitable for

reducing anxiety. Previous research has revealed the powerful effect music therapy can play in promoting relaxation and emotional control within a clinical population [3].

In addition to its direct effects on stress reduction, however, music therapy creates an avenue for children to express their emotions and to cope with their experiences in the hospital in a creative manner. Therapeutic interventions using music may build relationships between the therapist and the child facilitating emotional support that may not be available to the child through traditional medical care on its own. Research suggests that interactive music making can significantly reduce levels of cortisol and with that reduce physiological stress response. This is especially important when considering children who have pediatric health conditions as they are generally more sensitive to stress. [2,4].

Furthermore, the use of music therapy integrates the psychological and physiological aspects of healthcare, addressing the closely interconnected nature of emotional and physical health. For example, when music is combined with mindfulness practices it has shown potential to enhance characteristics for the psychosocial outcomes of patients [5,6]. This multifaceted approach highlights the importance of innovative treatment strategies within the pediatric setting and may imply that music therapy would be an important part of the complex of treatment strategies to manage stress within the hospital.

Despite the evidence for the effectiveness of music therapy in reducing stress and improving the overall well-being of hospitalized children, there are major gaps in the literature as to its use in other types of children and other clinical settings. Specifically, although there is some understanding, even in the literature, as to what music therapy can do immediately, including acute stress and anxiety [7-9], far less has been done to understand the long-term psychological impacts and how these interventions can be maximized, based on some of the needs of the patient, such as chronic illnesses or a treatment such as blood and marrow transplant [10-12]. Furthermore, the views and experiences of caregivers are frequently neglected by research which are important part of the therapeutic process [10,13,2]. This gap highlights the need for clearly defined music therapy approaches tailored to address the emotional and psychological challenges of children and their families across healthcare settings. Addressing this need may improve the effectiveness and integration of music therapy into routine pediatric care.

The effectiveness of music therapy in the presentation of stress in cases of hospitalized children has a lot of potential in itself, as they are backed up by the literature that has already documented the benefits of music therapy in several demographics of patients. The pilot study will help contribute important data to this emerging field and may direct future therapeutic practices and interventions to try to improve the emotional well-being of children in healthcare environments in the future.

METHODS

A quantitative research approach was adopted for this study in a true experimental pre-test and post-test research design to assess the effectiveness of music therapy to reduce stress among children who are hospitalized. The study was carried out in the Pediatric Department of some chosen hospital and the population was some children aged between 6 to 12 years, who were admitted into the pediatric department of the hospital. A total of 10 children were taken as the sample using Simple Random Sampling Technique. The inclusion was children who were experiencing stress because of being hospitalized, willing to participate, were available during the research period, were able to follow instructions and between the age of 6 and 12 years. Children that were uncooperative, had severe medical or psychological conditions or were unconscious were excluded from the study.

Tool for Data Collection

Stress levels were assessed using a standardized and age-appropriate stress assessment scale for hospitalized children. The tool consisted of structured items measuring behavioral, emotional and physiological indicators of stress and demonstrated acceptable validity and reliability. The pre-test was administered before the intervention and the post-test was conducted after completion of the music therapy sessions to evaluate changes in stress levels.

Intervention

Children received recorded calming instrumental music through headphones at a comfortable volume (50–60 dB) for 30 minutes per session, once daily for three consecutive days. The intervention was administered in a quiet ward setting by the researcher under pediatric nurse supervision, with minimal interruption to routine care. Pre-test assessment was conducted after stabilization and before the first session. Environmental factors such as medication, pain, noise and parental presence were monitored and outcome assessment was performed by a blinded evaluator.

RESULTS

Demographic Variables

Table 1 shows that the majority of the children in both groups, experimental and control group, were between 6-7 and 10-11 years with 40% each in the experimental group and 30% each in the control group, whereas 8-9 was more represented in the control group (40%). Females were in the majority in the experimental group (60%). Males and females were in equal number in the control group (50% each). The majority of the children in both the groups were in the care of their mothers, were first-borns and were from nuclear families. Most fathers had secondary or graduate education and most mothers had secondary or above-education. Family income was equally distributed in the experimental group and more control group families were earning income at the rate of Rs 8,000 per month. Almost a third lived in semi-urban areas, with almost all the participants living in semi-urban areas.

Table 1: Distribution of Demographic Variables (n = 10)

Demographic Variable	Experimental group		Control group	
	f	%	f	%
Age (years)				
6-7 years	4	40	3	30
8-9 years	2	20	4	40
10-11 years	4	40	3	30
Sex				
Male	4	40	5	50
Female	6	60	5	50
Primary Caretaker				
Mother	9	90	8	80
Father	1	10	2	20
Order of Birth				
First child	8	80	7	70
Second child	2	20	3	30
Father's Education				
Secondary	5	50	6	60
Graduate and above	5	50	4	40
Mother's Education				
Illiterate	1	10	2	20
Secondary	4	40	5	50
Graduate and above	5	50	3	30
Type of Family				
a. Nuclear	8	80	6	60
b. Joint	2	20	4	40
Monthly Family Income				
₹8,000	5	50	6	60
₹10,000	5	50	4	40
Place of Residence				
Semi-urban	10	100	9	90
Urban	0	0	1	10
Hobbies				
Playing games	2	20	3	30
Watching TV	5	50	4	40
Reading books	1	10	1	10
Riding bicycle	2	20	2	20

Table 2: Level of Anxiety among the Groups

Level of Anxiety	Experimental		Control	
	Pre-test f (%)	Post-test f (%)	Pre-test f (%)	Post-test f (%)
Low	0 (0%)	9 (90%)	1 (10%)	7 (70%)
Moderate	6 (60%)	1 (10%)	9 (90%)	3 (30%)
High	4 (40%)	0 (0%)	0 (0%)	0 (0%)

Table 3: Level of Stress among the Groups

Level of Stress	Experimental		Control	
	Pre-test f (%)	Post-test f (%)	Pre-test f (%)	Post-test f (%)
Low	0 (0%)	1 (10%)	0 (0%)	0 (0%)
Moderate	6 (60%)	9 (90%)	6 (60%)	5 (50%)
High	4 (40%)	0 (0%)	4 (40%)	5 (50%)

Table 4: Comparison of Stress and Anxiety Scores in the Groups

Variable	Group	Pre-test Mean±SD	Post-test Mean±SD	Paired t value	p value	Significance
Stress	Experimental	26.0±4.42	17.6±4.25	11.45	<0.001	S*
	Control	26.0±4.42	26.0±4.97	0.00	1.000	NS
Anxiety	Experimental	35.9±10.19	24.6±9.41	11.05	<0.001	S*
	Control	35.9±10.19	36.1±10.02	0.61	0.555	NS

*S-Significant at p<0.05, NS- Non significant

Table 5: Comparison of posttest Stress and anxiety Scores between Experimental and Control Groups

Variable	Experimental Mean±SD	Control Mean±SD	Unpaired t value	p value
Stress	17.6±4.25	26.0±4.97	4.06	<0.001* S
Anxiety	24.6±9.41	36.1±10.02	2.65	<0.001* S

*S-Significant at p<0.05, NS- Non Significant

Watching television was the most common hobby in both groups-followed by playing games and riding bicycles. In general, the demographic features of both groups were similar.

Anxiety and Stress

Table 2 shows that in pre-test, among the experimental group 60% and the control group 90% were moderate anxiety and 40 and 0% were high anxiety in the experimental group and control group, respectively. In the post-test, the experimental group had 90% and the control group had 70% of low anxiety and 10 and 30% of experimental group and control group had moderate anxiety respectively. High anxiety was not found in any participants in the post-test. This is an indication of significant reduction in anxiety particularly in the experimental group.

Table 3 suggests that in the pre-test 60% in both groups were moderately stressed and 40% were highly stressed. In the post-test 10% of the experimental group had a low level of stress and 90% had moderate stress and none of the children in the high level of stress category? In contrast, the number of people with moderate stress and high stress in the post-test was 50% each in the control group. This shows better improvement in stress levels in the experimental group.

Table 4 shows that, in the experimental group, the mean stress score significantly decreased from 26.0 in the pre-test to 17.6 in the post-test ($t = 11.45$, $p < 0.001$). In contrast, the control group showed no change in stress levels, with the mean score remaining at 26.0 in both the pre-test and post-test, which was not statistically significant ($t = 0.00$, $p = 1.000$).

Table 5 shows that, in the experimental group, the mean anxiety score significantly decreased from 35.9 in the pre-test to 24.6 in the post-test ($t = 11.05$, $p < 0.001$). In the control group, no significant change was observed, with the mean anxiety score increasing slightly from 35.9 in the pre-test to 36.1 in the post-test ($t = 0.61$, $p = 0.555$). These findings indicate the effectiveness of the intervention in reducing anxiety.

DISCUSSION

The results of the present study offer important information related to the level of anxiety and stress of hospitalized children. The experimental and control groups were similar on their demographic characteristics, which means that both groups were appropriate for valid comparison. This demographic balance reduced the selection bias and enhances the internal validity of the study. Similar methodological standards have been stressed in earlier pediatric studies [14-16].

The majority of the children in the study were first-born, in a nuclear family and were mainly looked after by their mothers. Most parents were well educated which indicates a supportive social and educational background. Such family environments are known to promote better coping skills and emotional adjustment of children [17-19].

Despite these good circumstances, in the beginning the children from both groups showed moderate to high levels of anxiety and stress. This finding serves as a perspective of recognizing that hospitalization per se is still a major psychological stressor due to reasons like separation from family, alien surroundings and fear of medical procedures [15,20].

The intervention implemented in the experimental group was the significant reduction of anxiety and stress levels. Notably, mean stress score improved from 26.0 $\pm$ 4.42 to 17.6 $\pm$ 4.25 showing the effectiveness of the intervention. These results are consistent with previous research studies that found positive results of creative and educational approaches in therapy to children [14,21].

Educational interventions in the form of digital learning packages have also been found to decrease anxiety by increasing children's knowledge and readiness for medical procedures [22,23]. The present findings support the thought that structured therapeutic strategies can be considerably helpful for producing enhanced emotional well-being within hospitalized children.

In contrast, there were no significant improvements in anxiety and stress levels in the control group. This difference between groups demonstrates the efficacy of the intervention and shows the importance in providing targeted psychological support. Similar conclusion has been reported in previous studies [14,21,22,15].

The results of this study stress the importance of psychological and emotional care for routine hospital services for pediatric patients. Hospitalized children commonly encounter significant emotional distress, which has been made to be lessened by structured interventions such as art therapy, music techniques and digital education programs [14,21,24,25,20].

Furthermore, the high levels of anxiety still seen in the control group suggests that the lack of specific interventions could lead to the persistence of emotional problems. This demonstrates a lack in the current healthcare practices and justify the need for preventive mental health strategies in pediatric care settings [22,24,26].

CONCLUSION

The present study concluded that the intervention was effective in reducing stress and anxiety among hospitalized children. The experimental group showed a significant decrease in mean stress and anxiety scores after the intervention, whereas no significant improvement was observed in the control group. The comparable demographic characteristics of both groups ensured valid comparison. Overall, the findings support the usefulness of the intervention as a supportive measure in pediatric care.

Recommendations

Based on the findings of the study, it is recommended that the intervention be incorporated into routine nursing care to help reduce stress and anxiety among hospitalized children. Nurses and healthcare professionals should be trained to implement this intervention effectively. Future studies should be conducted with a larger sample size and in multiple hospital settings to improve the generalizability of the results. Long-term follow-up studies are also recommended to evaluate the sustained effects of the intervention. Additionally, similar interventions may be applied to different age groups and clinical settings to enhance pediatric patient care.

Limitations

The study had certain limitations that should be considered while interpreting the findings. The sample size was small and limited to one hospital, which restricts the generalization of the results. The duration of the intervention and follow-up period was short, making it difficult to assess long-term outcomes. The use of self-reported and observational tools may have influenced the accuracy of responses. Furthermore, the study was confined to children aged 6–12 years and therefore the findings cannot be generalized to other age groups.

Ethical Statement

Ethical approval was obtained from the Institutional Human Ethics Committee of Meenakshi Medical College Hospital and Research Institute (EC/NEW/INST/2024/TN/0479) prior to data collection. Written informed consent from parents or guardians and assent from children were obtained. Participation was voluntary, confidentiality was maintained and routine medical care was not interrupted during the study.

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