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Effect of Music Therapy on Blood Pressure and Anxiety in Haemodialysis Patients

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Abstract

High blood pressure and anxiety level during haemodialysis remains a common problem in Chronic Kidney disease patients. The present study was conducted to evaluate the effect of music therapy on blood pressure and anxiety in haemodialysis patients at selected hospitals of Indore. Through simple random sampling (lottery method) a total of 60 samples were selected from the accessible population and then the subjects were assigned to experimental and control group through randomization (lottery method). After the pre-test, music therapy was given to the experimental group and routine care was encouraged to be continued in control group. The values of blood pressure score in each group before and after the intervention were measured using blood pressure apparatus (mercurial sphygmomanometer) and anxiety level was assessed with the help of Beck Anxiety Inventory-I. Findings of the study revealed that the mean post test blood pressure score in experimental group was 2.075 and the pre test score was 4.815 which was statistically significant at t29=4.840 at the level p <0.001 and the mean post anxiety score was 18.35 and the pre test score was 32.74 which was statistically significant at t 29 = 19.32 at the level p< 0.001. The values revealed that there is a significant changes in blood pressure as well as anxiety level after the administration of music therapy.

Keywords: Music therapy, hemodialysis, blood pressure, anxiety and hemodialysis patients.

Introduction

Kidney is an important organ of our body. The primary function of the kidney is to regulate the volume and composition of extra cellular fluid (ECF) and excrete waste products. It helps in maintaining the body in a healthy state. End stage renal disease (ESRD) is a slow progressive, irreversible destruction of functional unit of kidne5y caused by inherited disorder, prolonged medical condition such as diabetic mellitus and hypertension or long term use of certain medication[1].

Chronic kidney disease (CKD) is a global threat to health in general and for developing countries in particular, because the treatment is expensive and life-long. In India 90% patients cannot afford the cost. Over 1 million people worldwide are alive on dialysis or with a functioning graft. Incidence of CKD has doubled in the last 15 years[2].

In haemodialysis patient, there are chances for developing complications which occur during routine haemodialysis treatment. These include hypertension, hypotension, back pain, cramps, itching, chills and fever. Some research studies found that, the resolution for these complications is more effective when they are treated with a combination of pharmacological treatment and an alternative/complimentary therapy. Among these therapies, the most commonly used therapies are music therapy, aroma therapy, imagery therapy and massage. Out of which the music therapy has a predominant effect on Hemodialysis patients[3].

Need of the study: The people who are undergoing haemodialysis' develop anxiety. Anxiety is known to cause increased blood pressure, heart rate and respiration rate, all of which lead to poor circulation, and can cause fluctuations in body temperature, urinary urgency, enlarged pupils, and loss of appetite. Thus, it is always a challenge to care providers to keep anxiety at a minimum for patient's comfort and safety[4].

Though many research studies have been conducted abroad on effect of music therapy on various physiological and psychological parameters of patients but in India not much published literature could be retrieved. Evidence suggests that music therapy relieves anxiety and lowers high blood pressure as well as promotes a feeling of wellness and completely relaxes the patients during the 4-5 hours of haemodialysis procedure, and it is also cost effective. The researcher, herself, during her interaction with haemodialysis patients observed that they are very anxious during haemodialysis procedure. Very few studies have been done to assess the effectiveness of music therapy on anxiety and blood pressure during haemodialysis.

The investigator during her clinical experience had come across many haemodialysis patients, realized that due to long hours of haemodialysis session, patients become anxious by involuntarily focusing on their worries and problems which leads in fluctuation of blood pressure and other vital signs. To overcome this something needs to be done, so that patient feels relaxed during those 4-5 hours of haemodialysis. It was thought that Music therapy would be better as it is a simple

technique, less expensive, non-invasive and without any side effects. The patient only has to hear the prerecorded music through headphones during the procedure and felt that alleviation of this anxiety. It was also hypothesized that music will lower the high blood pressure. If it helps the patients they will accept it and make it a routine therapy to improve their quality of life. By doing this research project, the evidence can be generated and music therapy can be adopted as complementary therapy to reduce the suffering of these clients.

Discussion with the experts also helped to reaffirm that it is the need of the hour. Nurse and doctors of the nephrology department also felt the need for such a study. Therefore the researcher strongly believes that, this study is a felt need and will be useful for patient.

Objectives: To assess the blood pressure and anxiety level of experimental and control group of patients on haemodialysis before the administration of music therapy.

To associate the blood pressure and anxiety level with the selected socio-demographic variables of patients on haemodialysis among experimental and control group.

To associate the blood pressure and anxiety level with the selected clinical variables of patients on haemodialysis among experimental and control group.

To evaluate the effect of music therapy on values of blood pressure and anxiety level among experimental group of patients on haemodialysis.

Hypotheses: H1: There will be significant association between the selected demographic variables and values of blood pressure among experimental and control group of patients on haemodialysis at the level of $p < 0.05$. H2: There will be significant association between the selected demographic variables and level of anxiety among experimental and control group of patients on haemodialysis at the level of $p < 0.05$. H3: There is significant difference in the values of blood pressure among experimental group of patients on haemodialysis (after the administration of music) at the level of $p < 0.05$. H4: There is significant difference in level of anxiety among experimental group of patients on haemodialysis (after the administration of music) at the level of $p < 0.05$.

Conceptual Framework: The present study used Physiological measurement of stress[5]. It is postulated that individual responses to both internal and external stimuli can be emotional, cognitive, psychological behavioral or combination of these. According to this model, music therapy provides an alternate focus of attention and relaxation that increases a sense cognitive calm thereby eliciting psycho physiologic relaxation response and additionally serves as coping strategy for the patients.

Methodology

Research Methodology: Research Design: Two group pretest posttest design. **Population:** Patients who are hypertensive and are anxious during the procedure of haemodialysis. **Sampling technique:** Simple random sampling (lottery method). **Sample size**: 60 samples (30 in experimental and 30 in control group). **Setting:** Choithram Hospital and Research Center, Indore. **Tool:** The tool consisted of three sections.

Socio Demographic Variables: This section consists of seven items for obtaining information about selected demographic variables such as age, gender, religion, educational status, occupation, economic status and marital status.

Clinical variables: This section consists of five items for obtaining information about clinical variables such as type of illness, duration of haemodialysis, history of any co-morbid illness, history of taking medication for hypertension and previous experience of music therapy to reduce anxiety during haemodialysis

Blood pressure assessment: In this section assessment of blood pressure is done by the investigator using mercurial sphygmomanometer and charted as Systolic and Diastolic blood pressure in millimeters of mercury (mm Hg).

The scoring is done in following manner: i. Hypotension (Systolic BP- ≤ 110 / diastolic BP- ≤ 70). ii. Normal (Systolic BP-120-130/ diastolic BP – 80-90). iv. Mild hypertension (Systolic BP- 140-159/ Diastolic Bp 90-99). v. Moderate hypertension (Systolic BP- 160-179/ Diastolic BP- 100- 109). vi. Severe hypertension (Systolic BP- ≥ 180 / Diastolic BP- ≥ 110)[6].

Standardized Beck Anxiety Inventory-I for anxiety assessment: This section consists of the standardized tool given by Dr. Araon. T. Beck. It contains a list of common symptoms of anxiety, there are total 21 items. Scoring has been categorized in following manner:

Not at all- 0, Mild anxiety-1, Moderate anxiety-2, and Severe anxiety- 3, 0-21- low anxiety, 22-35- moderate anxiety, >36 – severe anxiety.

Validity: The tool was submitted to 9 experts including 5 nursing personnel from the field of Medical Surgical Nursing, two musicians, one Nephrologist and one Statistician. The experts were requested to check for the relevance, sequence and language of the Section A, and express their opinion regarding the Section B, Section C and D of the tool.

Reliability: The tool used was Standardized Beck Anxiety Inventory-I which has a well established reliability of r =0 .94 – 0.96 in illiterate and literate people.

The reliability for blood pressure assessment tool was done by using test re-test method and was found the r=1.0 for BP instrument i.e mercurial sphygmomanometer which was used for assessing blood pressure.

Procedure for Data Collection: The administrative authority and research ethics committee of Choithram Hospital and Research Centre, Indore had given permission prior to the data collection. The study was carried out in the same way as that of the pilot study. A total of 60 samples were selected from the accessible population as study subjects through simple random sampling (lottery method) and then the subjects were assigned to experimental (30) l and control group (30) by randomization. The actual data collection period was from 1st April 2014 to 1stMay 2014. The procedure for data collection was divided into pre-procedure, procedure and post procedure.

Pre-procedure: Selected the samples as per the inclusion criteria of the study. Through simple random sampling (lottery method) 60 samples were further assigned to experimental and control groups. Procedure was explained and consent was taken from all samples.

Procedure: Before intervention pretest blood pressure and anxiety score was obtained on the 1st and 2nd haemodialysis days to mark the baseline values of blood pressure and level of anxiety on haemodialysis and average of the 1st and 2nd d day were taken as pretest score. After determining the values of blood pressure and level of anxiety with the formulated tool, music therapy was administered to the experimental group of patients in following manner; 1st cycle (20 min music) on starting of dialysis, 2nd cycle (20 min) with a gap of 1 hour during the procedure and 3rd cycle (20 min) before half an hour of closure of procedure) was given. The researcher herself conducted the music therapy sessions with the help of (MP3) player and headphones It was a two day session for each patient .Each sessions consisted of three cycles of music i.e. four different patterns of *Kalavati Raag* played for the duration of 20 minutes. Before that the patient was instructed to relax completely and to concentrate on the music played. The environmental factors which distract the patients were minimized for each cycle of music. Trial out of the listed music was also kept and the patients were asked to select as per their choice in order to assess which type of music is most preferred by each patient. Subjects in the control group were asked to continue with routine care. The intervention was done on 4thand 5th haemodialysis days after the samples were selected for the study.

Post- procedure: Post- test was taken on the 4thand 5th haemodialysis days after the samples were selected for the study, soon after the intervention to assess the post intervention changes in blood pressure and anxiety level on haemodialysis and an average of 4th and 5th and day were taken as post-test score.

Findings: Socio Demographic Characteristics: Among all the study participants, more than one-third of the samples i.e.11 (36.67%) in the experimental group and 9(30%) in the control group belonged to the age group of 36-45 years of age. In the experimental group male samples 21 (70%) outnumbered the female samples 9 (30%) and in the control group also male samples 20(66.67%) outnumbered the female samples 10(33.33 %).

Regarding religion, majority 24 (80%) the experimental group and 19 (63.33%) in the control group were Hindus.

In relation to the educational status, nearly half of the samples in the experimental group i.e.13 (43.34%) had high school education and in the control group more than one third of the samples 11 (36.67%) were having middle school education.

It was found that more than one-third i.e. 11(36.67%) of the study participants in the experimental group and 9(30 %) of the study participants in the control group were unemployed.

The data concerning economic status revealed that one third of the samples 10(33.33%) in the experimental group were having monthly income of Rs.10,000- 20,000 and nearly half of the samples i.e.13 (43.33%) in the control group were having a monthly income of < Rs 20,001-30,001/-. Regarding the marital status nearly three fourth i.e.20 (66.67%) of the study samples in the experimental group and 21 (70%) in the control group were married.

Clinical Variables: Majority of the samples i.e 25 (83.33%) in the experimental group were undergoing haemodialysis for more than six months and more than three fourth of the samples 22(73.33%) in control group were undergoing haemodialysis for more than six months.

Nearly three fourth of the samples 22(73.33%) both in the experimental and control group were having the history of anemia as co-morbid illness.

It was found that all the study participant in both the experimental group and control group 30(100%) were having history of taking medication for hypertension before haemodialysis.

Both the experimental group and control group i.e 30(100%) were not having any previous experience of music therapy to reduce anxiety during haemodialysis.

Assessment of values of blood pressure during haemodialysis among experimental group: Data in figure-1 shows that values of blood pressure during haemodialysis among experimental group on blood pressure assessment tool. It depicts that more than three fourth of the samples i.e. 24 (80%) were having severe hypertension and less than one fourth 6 (20%) were having moderate hypertension before intervention.

After the music therapy, there was reduction in the values of blood pressure as more than three-fourth of the samples i.e. 26 (86.67%) were having normal blood pressure and less than one-fourth 4 (13.33%) were having mild hypertension.

Frequency and Percentage of values of blood pressure during haemodialysis among control group: Data presented in figure-2 shows that values of blood pressure during haemodialysis among control group on blood pressure assessment tool. It depicts that more than three fourth of the samples i.e.23 (76.67%) were having severe hypertension and less than one fourth 7 (23.33%) were having moderate hypertension before intervention. In post test, no change was found.

Assessment of level of anxiety during haemodialysis among experimental group: Data presented in figure-3 shows the level of anxiety during haemodialysis among experimental group measured on Beck Anxiety Inventory.-I. It depicts that more three fourth of the samples i.e. 24 (80%) were having moderate anxiety and less than one-fourth (20%) were having severe anxiety in pre-test. After music therapy there was reduction in the level of anxiety i.e 30(100%) of the samples were having mild anxiety.

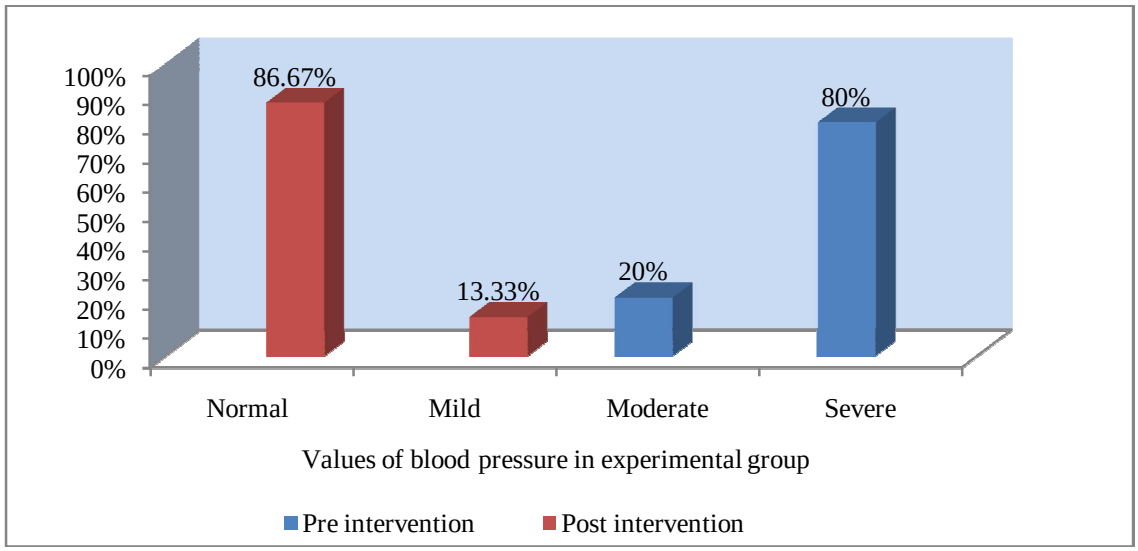

Figure-1
Bar diagram showing values of blood pressure during haemodialysis among experimental group

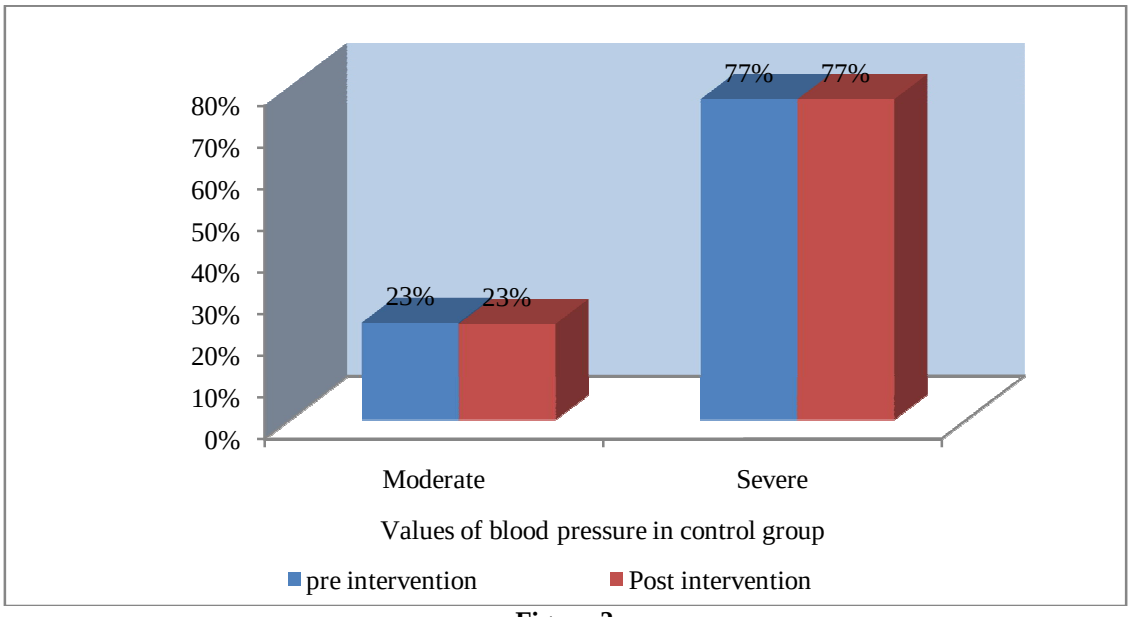

Figure-2
Bar diagram showing values of blood pressure during haemodialysis among control group

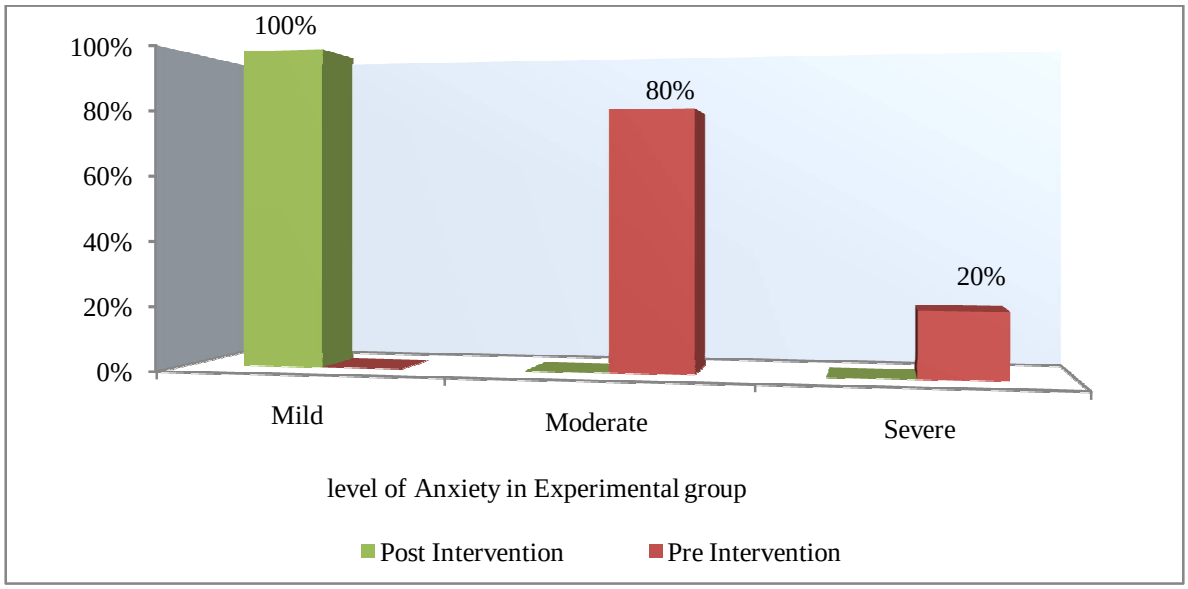

Figure-3
Bar diagram showing level of anxiety during haemodialysis among experimental group

Assessment of level of anxiety during haemodialysis among control group: The data in fig no:4 reveals that in control group more than three fourth of the samples i.e. 25 (83.33%) were having moderate anxiety and less than one-fourth 5 (16.67%) were having severe anxiety in pre-test .In post-test also more than three fourth 23 (76.66%) were having moderate anxiety and less than one-fourth 7 (23.34%) were having severe anxiety with routine care.

Association between the Values of Blood Pressure on Haemodialysis and Selected Socio Demographic Variables and Clinical variables Among Experimental and Control Group: Data presented revealed that there was no significant association between the values of blood pressure and selected socio-demographic variables and also with clinical variables (age, gender and economic status) in experimental group and control group at the level $p < 0.05$. Hence H1 is rejected.

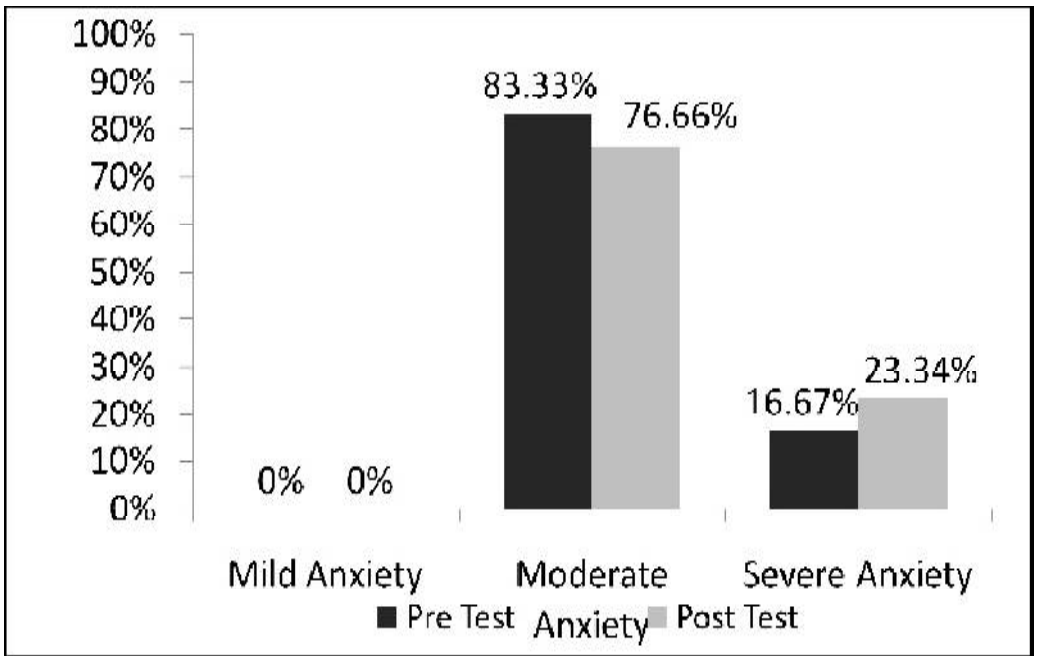

Figure-4
Bar diagram showing level of anxiety during haemodialysis among control group

Association between the Level of Anxiety and Selected Socio Demographic Variables and Clinical variables among Experimental and Control Group: Data presented that there was no significant association between the level of anxiety and selected socio-demographic variables and clinical variables (age, gender and economic status) in experimental group at the level $p < 0.05$. Hence H2 is rejected

Effectiveness of music therapy on blood pressure in experimental group: $p < 0.05$* $p < 0.01$ $p < 0.001$*** S – Significant:** Data presented in Table No 1 depicted that the compute "t" value 4.840 at df 29 with SD pre test-.4561, post test-.3021 indicates that there was significant difference between pretest and post test of values of blood pressure score in experimental group at the level $p < 0.001$. Thus, there was significant reduction in the values of among experimental group and H3 is accepted.

Effectiveness of music therapy on level of anxiety in experimental group: $p < 0.05$* $p < 0.01$ $p < 0.001$*** S – Significant:** Data presented in Table No .2 depicted that the computed t value 19.32 at df 29 with SD pre test-4.941, post test-1.947 indicates that there was significant difference between pre-test and post-test score of level of anxiety in experimental group at the level of $p < 0.001$. Hence there was a significant reduction in level of anxiety among experimental group. Thus H_4 is accepted.

Section IX: Most preferred music by the patients from the investigators music list: It was seen that the majority of the patients liked all the music given by the researcher and among them *Bansuri* was most preferred one.

Table-1
Values of pretest and posttest score of blood pressure in experimental group.

Groups	Mean	S D	Mean Difference	SE	Df	" t " Value	Table Value.
Pre-test score	4.815	.4561					
		.3021	2.74	.0564	29	4.840***	2.05
Post-test score	2.075					(S)	

Table-2
Values of pretest and posttest score of level of anxiety in experimental group

Groups	Mean	SD	Mean Difference	SE	df	" t " Value	Table Value.
Pre-test score	32.74						
		4.941	14.39	.7314	29	19.32***	2.05
Post-test score	18.35	1.947				(S)	

Music list	Patient's choice n = 30 (experimental group)	
	Frequency	Percentage (%)
Raag Kalawati- Part-1-Priyank Desai on flute- Vikas yenduri on Tabla. Teentaal	2	6.67
Sitar and Tabla	3	10
T. Bansuri Indian flute inner joy	6	20
Pt. Shivkumar Sharma-Raag Kalavati (Alap- jod-jhala)	2	6.67
All the music listed above	17	56.66

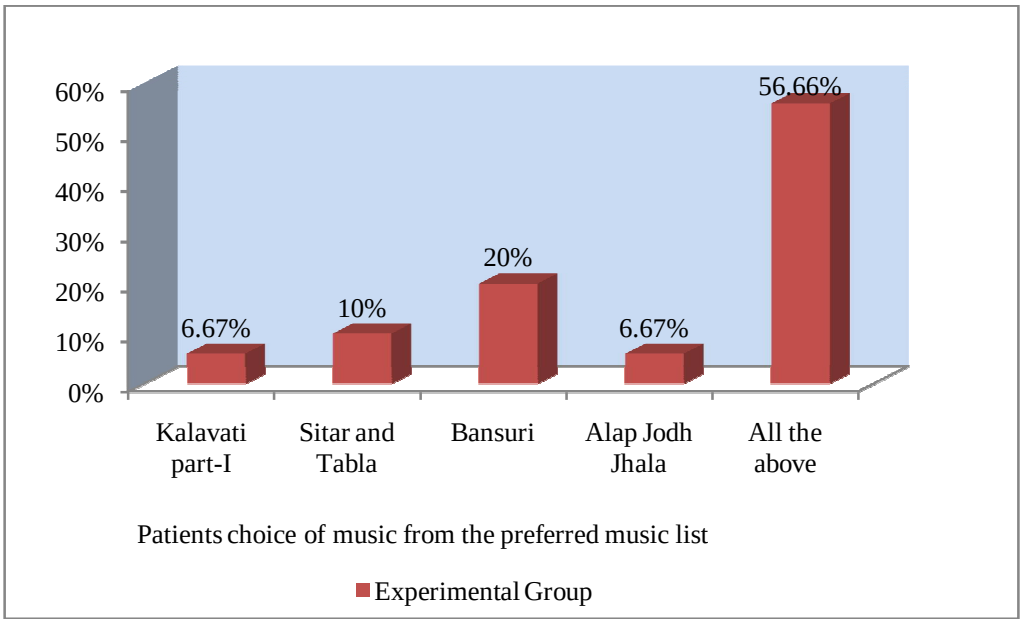

Figure-5
Bar diagram showing preferred music by the patients from the investigators music list

Discussion: Assessment of values of blood pressure during haemodialysis among experimental and control group: The data in this study revealed that in experimental group, more than three-fourth of the samples i.e.21 (70%) were having severe hypertension and less than one-fourth of the samples 9 (30%) were having moderate hypertension before intervention. After the music therapy, there was reduction in the values of blood pressure as more than three-fourth of the samples 24 (80%) were having normal blood pressure and less than one -fourth 6 (20%) were having mild hypertension. In control group more than three-fourth of the samples 19 (63.33%) were having severe hypertension and less than one -fourth of the samples 6 (20%) were having moderate hypertension in pretest. In post test no change in the values of blood pressure were found in this group.

Assessment of level of anxiety during haemodialysis among experimental and control group: The data in the present study revealed that in experimental group, two third of the samples i.e.20 (66.67%) were having moderate anxiety and one third of the samples 10 (33.33%) were having severe anxiety before intervention. After the music therapy, there was reduction in the anxiety level as all the samples i.e. 30(100%) reported mild anxiety. In control group nearly three fourth of the samples 22 (73.33%) were having moderate anxiety more than one-fourth 8 (26.67) were having severe anxiety in pretest. In post test also nearly three-fourth of the samples i.e 22(73.33%) were having moderate anxiety and more than one-fourth of the samples 8 (26.67%) were having severe anxiety.

The above findings are supported by the following studies: Novacovic. M, 2007[7] conducted a comparative cross sectional study to estimate the prevalence of the anxiety in dialysis patients. This study included 753 patients on chronic haemodialysis in Bosnia and Herzegovina (B and H) in the period 1999-2004. The patients were divided into two groups: the first group included 348 patients with Balkan Endemic Nephropathy (BEN), and the control group included 405 patients with other diagnoses causing renal insufficiency (N18). The study was tested using questionnaires for assessing anxiety, depression and general mental health status. Socio-demographic data showed highly significant differences between BEN and N18 in relation to place of residence (urban/rural) (χ^2 = 23.970, $p < 0.01$); in the incidence of renal co morbidity (χ^2 = 23.970, $p < 0.01$), familial renal co-morbidity (χ^2 = 23.970, $p < 0.01$) and migrations (χ^2 = 4.874, $p < 0.01$). Beck Anxiety Inventory scores were highly significantly different between the two groups ($p < 0.001$), in regard to the incidence and variables. Hamilton Depression Rating Scale demonstrated a group significance ($p < 0.001$), and variables pointed to somatisation, general anxiety and depression. The study concluded that anxiety is present in all dialysis patients.

Effectiveness of music therapy on blood pressure during haemodialysis among the experimental group: In the present study, the mean difference of pretest post test score of values of blood pressure in the experimental group was 5.3533. The reduction in the blood pressure score was found statistically significant at the level of $p < 0.001$. Thus, music therapy was found effective in the reducing the blood pressure among patients undergoing haemodialysis.

Hence H_3 - There is significant reduction in values of blood pressure during haemodialysis among experimental group after music therapy at the level of $P < 0.05$ was accepted.

Above findings are supported by the study conducted by

Schuster B.L 2009[8], who did an experimental study sin United Kingdom to determine the effect of music therapy in reducing the amount of fluctuation in the blood pressure of patients undergoing haemodialysis treatment. The samples were adult patients undergoing haemodialysis who were between the ages of 22 and 81. The control group received blood pressure measurement after each hour of dialysis. The experimental group received the same blood pressure measurement but received music prior and after the treatment. The statistical tests revealed no significant difference between the groups. However, the results were statistically significant for every blood pressure reading. Therefore, the researcher concluded that, the experimental group displayed less anxiety upon entering the treatment room, suggesting that the opportunity to listen to music reduced their anxiety.

Effectiveness of music therapy on anxiety level during haemodialysis among the experimental group: In the present study, the mean difference of pretest post test score of level of anxiety in the experimental group was 5.3533. The reduction in the anxiety score was found statistically significant at the level of $p < 0.001$. Hence H4 - There is significant reduction in level of anxiety during haemodialysis among experimental group after music therapy at the level of $P < 0.05$ is accepted.

Above findings is being supported by Kim K.B and Lee M.H.[9] who conducted an experimental study to determine the effects of music therapy on anxiety and depression in patients undergoing Hemodialysis. A non equivalent control group pre test–post test design was used. They selected 36 samples (experimental group-18; control group-18) who received Hemodialysis in three different hospitals located in Seoul, Korea. The data were collected through music preference questionnaire (MPQ), anxiety measurement, and depression measurement. The results revealed that the experimental group had less anxiety scores than the control group ($F=8.05$, $p=0.008$) and the experimental group had less depression than the control group ($F=11.86$, $p=0.002$). It was concluded that, music therapy may be applied as a method of nursing intervention contributing to the improvement of quality of life by reducing the anxiety and depression of patients undergoing haemodialysis.

Conclusion

The findings reveal that the music therapy is effective in reducing anxiety and blood pressure among patients undergoing haemodialysis. The two groups were explained the effectiveness of music therapy ((listening of music (Kalawati Raag) during the procedure. It is suggested that more nursing studies should come up to find out various non pharmacological methods for reducing anxiety and reduce blood pressure in patients undergoing haemodialysis.

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