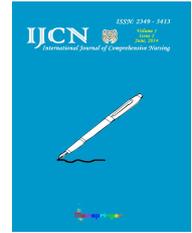




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## Impact of music therapy during hemodialysis on selected physiological parameters of patients undergoing hemodialysis in selected hospitals

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### ABSTRACT

#### Background:

Dialysis is the treatment of choice for end stage renal disease. Calm music has been found effective in reducing patient's blood pressure and also benefits patient's emotionally and physically. Non-pharmacological nursing interventions, such as music therapy, benefit clients by reducing anxiety and fatigue.

#### Objectives:

To assess the findings of selected physiological parameters before and after music therapy among patients of interventional and standard care group undergoing hemodialysis.

To compare the findings of selected physiological parameters interventional and standard care group before and after hemodialysis.

To associate demographic variables with selected physiological parameters.

**Setting:** Hemodialysis unit of a selected hospital

**Participants:** 30 patients with chronic kidney disease undergoing hemodialysis.

#### Methods and Materials:

The questionnaire was administered 10 minutes before and after hemodialysis, and blood pressure was measured 5 minutes before and after hemodialysis. Tools used were

1. Checklist individual strength questionnaire to assess fatigue
2. Specially calibrated sphygmomanometer to measure BP
3. Music therapy specially designed for hemodialysis patients

#### Results:

Findings of the study indicated that there is significant decrease in fatigue of experimental group ( $p < 0.05$ ) as compared to control group. There was no difference seen in blood pressure of experimental group ( $p > 0.05$ ) when compared to control group. Paired t test was used for comparison of parameters before and after the crossover and two sample t test was used for comparison between the groups. One way ANOVA showed that, there is no association between physical parameters (fatigue, blood pressure) and demographic variables.

#### Conclusion:

The study found that while music therapy was highly effective in reduction of fatigue, it had no significant effect on the blood pressure. Further studies to assess the effect on blood pressure need to be carried out by using music therapy for a longer duration and frequency of administration.

### Introduction:

Chronic kidney diseases have become an important global non communicable disease epidemic with severe implications on human and health resources of the country. The absence of a renal registry in India makes it even more difficult to estimate the true proportions of this diseases and its impact on the population. According to WHO, every year 8,50,000 deaths and 115 million disability adjusted life years occur by diseases of the kidney and urinary tract. Chronic kidney disease (CKD) is a global threat to the population in general, more so for developing countries in particular, as the therapy is prolonged, costly and life-long. Over 1 million people alive worldwide are on dialysis or with a functioning graft. Incidence of CKD has doubled in the last 15 years.

WHO estimates that Chronic kidney disease is the 12<sup>th</sup> leading cause of death and 17<sup>th</sup> cause of disability globally. The National Kidney Foundation (India) estimates approximately 200,000 people in India develop terminal kidney failure annually and many more suffer from lesser forms of kidney disease<sup>1</sup>. Hemodialysis is a lifelong treatment for end stage

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renal disease that significantly affects the patients physically and mentally. Intradialytic hypotension is a common complication of Hemodialysis and is associated with poor outcomes<sup>2</sup>. Increase in Blood pressure during hemodialysis can occur in up to 15% of patients and is also associated with adverse short-term outcomes<sup>3,4</sup>. Several studies have shown that hemodialysis patients often have sleep problems, and complain of chronic fatigue and “lack of energy”<sup>5,6</sup>.

Jula K. Inrig, Uptal D. Patel, Robert D. Toto, and Lynda A. Szczech associated blood pressure increase in hemodialysis patients with 2 year mortality and found that an increase in systolic blood pressure of >10mmHg during hemodialysis occurs in more than 10% of patients and was associated with decreased 2-year survival. But these findings were found to be limited to patients with a predialysis systolic Blood pressure less than 120 mmHg<sup>7</sup>.

Cantekin I, Tan M, Ren Fail (2013) conducted a pretest-posttest control group experiment to analyze the influence of music therapy on perceived stressors and anxiety levels of hemodialysis patients in hemodialysis (HD) Units of Ataturk University Yakutiye Research Hospital and Regional Education. The study was completed with 100 patients and it was found that music therapy was influential in reducing anxiety levels and perceived stressors of hemodialysis patients. The authors concluded that music therapy can be used as an independent nursing initiative to help in fulfilling the physical, emotional, and psychological requirements of patients undergoing hemodialysis.<sup>8</sup>

Lin YJ, Lu K. C, Chen C M, et al. (2012) conducted a study in china to assess the effect of music therapy on the overall well-being of elderly patients on maintenance hemodialysis. One week after the use of music therapy during hemodialysis, the authors noted significant reductions in the frequency and severity of adverse reactions during dialysis. The authors concluded that listening to music during hemodialysis may promote overall patient well-being. Music therapy in the form of a complementary therapy could facilitate care and delivery of adequate dialysis and thus improve overall patient well-being in the long run.<sup>9</sup>

A study on the effects of music therapy on anxiety and depression in patients undergoing hemodialysis by Taehan Kanho Hakhoe Chi (2006) was done using a nonequivalent control group pretest-posttest design. Thirty Six subjects who received hemodialysis in three hospitals located in Seoul were studied. The measures were a Music Preference Questionnaire (MPQ), anxiety measurement, and depression measurement. Results found that patients undergoing hemodialysis who received music therapy had less anxiety than patients undergoing hemodialysis who did not receive music therapy ( $F=8.05$ ,  $p=.008$ ). Depression was lesser in patient undergoing hemodialysis who received music therapy than patients undergoing hemodialysis who did not receive music therapy ( $F=11.86$ ,  $p=.002$ ). The results of this study implied that music therapy may be effective as a method of nursing intervention and could contribute to the improvement of quality of life by reducing their anxiety and depression of patients undergoing hemodialysis<sup>10</sup>.

Several studies have been done to alleviate the side effects of hemodialysis using complimentary therapies. The review of literature shows that music therapy has an effect on depression, pain, stress and anxiety of hemodialysis patients but there is lack of evidence that shows the effect. The difficulty with introducing complementary therapies such as music therapy into nursing practice is that there is little empirical evidence to support its use. It is also observed that published research studies and trials on music therapy in the Indian setting are very limited. Hence this study may be considered important in providing empirical evidence and its efficiency in reducing the complications of hemodialysis patients.

### Objectives

- To assess the findings of selected physiological parameters before and after music therapy among patients of interventional and standard care group undergoing hemodialysis.
- To compare the findings of selected physiological parameters interventional and standard care group before and after hemodialysis.
- To associate demographic variables with selected physiological parameters.

### Materials and methods:

A cross over research design was used in this study as the influence of confounding variables is reduced since each crossover participant acts as his or her own control.

### Setting and participants:

Hemodialysis unit of a selected hospital. 30 participants who were coming to hemodialysis unit on regular basis, thrice a week (on alternate days) were included. Patients with end stage renal disease willing to participate in the study were included and those who were acutely ill and using any complementary therapies were excluded.

**Phase I:** In this phase, 30 participants who were fulfilling the inclusion criteria, were randomly selected using lottery method and divided into two groups of 15 each.

**Phase II:** After 5 sessions of hemodialysis with music therapy, cross over of the participants of first phase was done.

### Tools and Techniques:

The data collection tool consisted of three sections:

**Section I – Demographic data:** Demographic data consisted of Age, Gender, Educational status, duration of suffering from chronic kidney disease, number of years of receiving hemodialysis, and any relaxation methods used in the past

**Section II- Assessment of fatigue:** The Checklist Individual Strength (CIS) (Vercoulen et. al, 1994) which measures subjective fatigue and related behavioral aspects was modified for the study. The original CIS consists of 20 statements. The patient has to indicate on a 7-point Likert scale to what extent the particular statement is applicable to him or her (1 = Yes, to 7 = No). The statements refer to four aspects of fatigue: (1) subjective fatigue (e.g., I feel tired), (2) reduced

motivation (e.g., I have no desire to do anything), (3) reduced activity (e.g., I don't feel like doing any activity during the day), and (4) reduced concentration (e.g., I cannot concentrate on my job). The modified tool consisted of 8 items related to subjective fatigue. Correlation coefficient calculated by using Pearson's Correlation Coefficient and it was found to be 0.98.

**Section III- Assessment of blood pressure.** One sphygmomanometer was calibrated and certified for fitness to use for the study.

**Section IV- Intervention:** The music was prepared and validated by a noted musician. The music was based on Rag Yaman which is a very popular composition from Hindusthani Classical Music. This Raga has all the notes (Surs), the Ma being teevra (sharp). All these notes are high level note and hence according to Sur Sanjeevan Music Therapy they are connected to Vayu & Akash Panch Mahabhootas and the Vat Dosh. These notes (Surs) relax the stress, elevate the happy mood, Positive thinking of the participants. It also reduces the Anxiety, negative thoughts from your minds. This music is played on three instruments i.e. Flute, Sitar & Shehnai. After listening, the music would give a pleasant relaxing effect. This music has been tried and proven to be very effective on Hypertension, Depression etc <sup>11</sup>

The tool was validated by 15 experts. Reliability of the tools was tested using test- retest method.

#### **Description of Intervention:**

The experimental group participants received music therapy using iPod or tape recorder with head phones throughout the hemodialysis. The questionnaire was administered 10 minutes before and after hemodialysis, and blood pressure was measured 5 minutes before and after hemodialysis. The process was continued for five sessions. Blood pressure and fatigue was measured before and after each session of hemodialysis for the experimental and control group in phase I and II. The control group received standard treatment given to all patients during hemodialysis.

#### **Ethical Considerations:**

The study was approved by the institutional ethics committee. Precautions were taken to ensure confidentiality of participant information and written consent was taken from participants before inclusion in the study.

#### **Results and Statistical Methods:**

For analysis purpose the participants were divided into two groups of 30 each (**Table No 2**). Majority (33.3%) of the study participants belonged to the age group 50 – 59 years and Maximum (63.3 % were males. Most (73.3%) of the participants had the disease for less than 3 years and maximum (73.3%) were on hemodialysis for less than 3 years. Most (90 %) of the participants had never tried any relaxation methods in the past. (**Table No 3**)

Analysis of findings within the group and between the groups was done. Inter and intra group comparison showed that, there is highly significant difference between pre and post test fatigue score in interventional group when compared to standard care group as the P value is <0.05. (**Table No 4**). Music therapy was found to be effective in decreasing the fatigue of patients who are undergoing hemodialysis. Findings indicated that from session 2 onwards there was decrease in the fatigue scores of patients receiving music therapy.

No Significant difference was also seen in the systolic and diastolic blood pressure of the intervention group ( $p < 0.05$ ). There was no association between the physiological parameters and demographic variables like age, gender, chronicity etc. Analysis of data related to group acting as their own controls revealed that music therapy was effective ( $p < 0.05$ ), since the participants who had not received music therapy in the first phase had improved fatigue score in the second phase after receiving music therapy. A similar effect was seen on the blood pressure also ( $p < 0.05$ ) (**Table No 5 & 6**).

#### **Discussion:**

Results have indicated that music therapy has a definite impact on fatigue of hemodialysis patients but not on the blood pressure. Blood pressure variations after hemodialysis are a major cause of mortality among these patients and nursing intervention to minimize this fluctuation is essential. There was no significant association between the demographic variables and physiological parameters. This study has highlighted the need for use of effective relaxation therapies like music to reduce the fatigue among patients receiving hemodialysis.

This study findings are in consistent with the study conducted by Mc Cann, Boore (2000) in their descriptive correlational study examined and found that the patients suffer from high level of fatigue with correspondingly low levels of vitality<sup>12</sup>. This study has also highlighted the fact that fatigue levels of patients are very high. The study findings are also comparable to study done by Jing L, Xudong. W (2008) which shows that music is effective in reducing fatigue induced by aerobic exercises<sup>13</sup>. Similarly Bussakorn B, Somrat L et al. (2013) studied the effect of music intervention on patients undergoing hemodialysis and found significant improvements in blood pressure and pulse rate and statistically significant reductions in pain and anxiety for patients in both music interventions ( $P < .05$ ). The results of this study are comparable to many other studies <sup>14</sup>.

#### **Conclusion:**

There is evidence to accept music therapy as a nursing intervention in caring for patients undergoing hemodialysis. Music therapy is effective in decreasing fatigue as well as blood pressure among patients undergoing hemodialysis. Further studies on larger samples are needed to enhance acceptability of music therapy as a nursing intervention for hemodialysis patients. Music therapy is a low cost, easily available modality for use. Its use in decreasing anxiety, depression, pain, fatigue and blood pressure has been proved time and again.

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**Table 1: Fatigue Scoring key. (Maximum possible score was 56 and Minimum was 7)**

S. No	Score	Interpretation
1	<27	Normal fatigue
2	27 – 35	Elevated fatigue
3	>35	Sever Fatigue

**Table 2: Participant groups before and after cross over**

	Group I	Group II	N
Intervention	15	15	30
Control	15	15	30
Total	30	30	60

**Table 3. Demographic distribution of participants (N=30)**

Demographic variables		Frequency	%
1. Age in years			
a.	20 – 29	3	10
b.	30 - 39	1	3.3
c.	40 – 49	8	26.7
d.	50 - 59	10	33.3
e.	60 – 69	8	26.7
2. Gender			
a.	Male	19	63.3
b.	Female	11	36.7
3. Education			
a.	Never gone to school	3	10
b.	Primary	11	36.7
c.	Secondary	11	36.7
d.	Graduate	5	16.7
4. Duration of disease			
a.	3 months – 3 years	22	73.3
b.	4 – 6 years	5	16.7
c.	7 – 9	2	6.7
d.	>10 years	1	3.3
5. Duration on hemodialysis			
a.	3 months – 3 years	22	73.3
b.	4 – 6 years	7	23.3
c.	7 – 9 years	1	3.3
6. Relaxation techniques used in the past			
a.	Yes	3	10
b.	No	27	90.0

**Table 4: Level of fatigue of participants before and after music therapy during hemodialysis in interventional group.**

Music therapy session	Group	Mean	SD	T value	P value
1	Intervention	0.4	3.7	1.9	0.029
	Standard care	-1.6	4.4		
2	Intervention	3.6	3.2	4.5	0.000
	Standard care	-0.6	4.0		
3.	Intervention	3.6	2.5	5.5	0.000
	Standard care	-0.2	2.9		
4	Intervention	2.9	2.0	6.9	0.000
	Standard care	-1.0	2.4		
5.	Intervention	2.8	1.6	8.1	0.000
	Standard care	-1.2	2.3		

**Table 5: Comparison of SBP in intervention and standard care group**

Music therapy session	Group	Mean	SD	T value	P value
1	Intervention	4.9	19.4	-0.8	0.212
	Standard care	9.8	26.8		
2	Intervention	9.4	17.7	0.3	0.393
	Standard care	8.3	12.0		
3.	Intervention	8.9	14.7	-0.3	0.374
	Standard care	10.0	12.4		
4	Intervention	10.5	17.1	0.4	0.362
	Standard care	8.9	16.3		
5.	Intervention	11.5	16.9	-0.3	0.369
	Standard care	13.3	24.0		

**Table 6: Comparison of DBP in intervention and standard care group**

Music therapy session	Group	Mean	SD	T value	P value
1	Intervention	-0.7	14.4	0.4	0.357
	Standard care	-2.0	13.7		
2	Intervention	1.3	12.2	-0.9	0.198
	Standard care	4.0	11.9		
3.	Intervention	8.0	15.6	0.8	0.217
	Standard care	5.0	13.8		
4	Intervention	2.7	10.8	-0.1	0.451
	Standard care	3.0	9.9		
5.	Intervention	-0.7	8.7	-1.0	0.154
	Standard care	2.0	11.3		

**Conflict of Interest:** Nil

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**References**

1. WORLD HEALTH ORGANIZATION: Burden of disease project. Available at <http://www3.who.int/whosis/menu.cfm?path=evidence,burden&language=english>. Accessed September 2013.
  2. Shoji T, Tsubakihara Y, Fujii M, Imai E. Hemodialysis-associated hypotension as an independent risk factor for two-year mortality in hemodialysis patients. *Kidney Int.* 2004;66:1212–1220.
  3. Chen J, Gul A, Sarnak MJ. Management of intradialytic hypertension: the ongoing challenge. *Semin Dial.* 2006;19:141–145.
  4. Inrig JK, Oddone EZ, Hasselblad V, et al. Association of intradialytic blood pressure changes with hospitalization and mortality rates in prevalent ESRD patients. *Kidney Int.* 2007; 71:454–461.
  5. Sakkas G. K., Gourgoulianis K. I., Karatzaferi C., et al. Haemodialysis patients with sleep apnoea syndrome experience increased central adiposity and altered muscular composition and functionality. *Nephrol. Dial. Transplant.* 2008. 23, 336–344
  6. Marcora S. M., Staiano W., Manning V. (2009). Mental fatigue impairs physical performance in humans. *J. Appl. Physiol.* 106, 857–864
  7. Jula K, Inrig, Uptal D, Patel, Robert D, Toto, and Lynda A, Szczech, Association of Blood Pressure Increases During Hemodialysis With 2-Year Mortality in Incident Hemodialysis Patients: A Secondary Analysis of the Dialysis Morbidity and Mortality Wave 2 Study. *Am J Kidney Dis.* Nov 2009; 54(5): 881–890.
  8. I. Cantekin, M. Tan Determination of sleep quality and fatigue level of patients receiving continuous ambulatory peritoneal dialysis in Turkey. *Scandinavian Journal of Urology and Nephrology* 2011 45:6, 452-460
  9. Lin Y J, Lu KC, Chen C M, Chang CC. The effects of music as therapy on the overall well-being of elderly patients on maintenance hemodialysis. *Biological research for nursing.* 2012-14. Jul 14 (3).p.277-285.
  10. Taehan Kanho Hakhoe Chi. The effect of music therapy on anxiety and depression in patients undergoing hemodialysis. 2006. Apr, 36 (2):321-9.
  11. Pt. ShashankKatti. Pioneering Sur-Sanjeevan. MET Institute of Alternative Careers (MET IAC). Available from URL, <http://www.met.edu/Institutes/IAC/POI.asp>.
  12. McCann, K. & Boore, J.R.P. (2000). Fatigue in persons with renal failure who require maintenance haemodialysis. *Journal of Advanced Nursing*, 32 (5), 1132- 1142
  13. Jing L, Xudong W (2008). Evaluation of the effects of relaxing music on the recovery from aerobic exercise induced fatigue. *J Sports Med Phy Fitness.* 2008. Mar;48 (1): 102-106.
  14. Bussakorn B, Somrat L, Effects of Music Intervention on Patients Undergoing Hemodialysis in the Bangkok Metropolitan Administration Hospitals. *Music and Medicine* Jul 2013; 5(3):188-193. DOI: 10.1177/194386211349570.
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