Original Article

Effect of Music Therapy on Blood Pressure among Hemodialysis Patients at tertiary care hospital

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Abstract

Variation in blood pressure due to renal disorder and dialysis procedure is common.
Objectives: Study aimed at assessing the Effect of Music Therapy on Blood Pressure in Hemodialysis Patients. **Settings and Design:** study conducted at renal unit of the Krishna hospital karad, Maharashtra with True experimental design. **Methods and Material:** Two group pretest posttest design was selected, 42 Patients who are hypertensive and anxious during the procedure of Hemodialysis were selected by Simple random sampling, and then samples were divided into two control and experimental group. After determining the blood pressure, on 4th and 5th Hemodialysis days after the samples were selected for the study, Raga Neelambari in the classical Indian classical of music was administered. Post test was conducted to assess the variation after music intervention. **Statistical analysis used:** Descriptive statistics and inferential statistic was used to assess the effectiveness of music therapy. **Results:** Effectiveness of Blood Pressure was seen by in experimental group where mean score was 5.2 with standard deviation 1.96 and t test score was 3.01 and when it is compared to the table value, was high. It indicates that the listening to music was effectives in normalizing the blood pressure. **Conclusions:** Music therapy would be considered as effective measure to normalize blood pressure..
Index Terms— Music Therapy, Blood Pressure, Hemodialysis.

INTRODUCTION

Many studies among Hemodialysis patients have stated that hypertension during dialysis is associated with adverse consequences in term of mortality and morbidity. Hypertension is common in patients with renal disorders and remains uncontrolled in dialysis[1]. It is currently unknown which time period correlates best with long-term patient outcome, given the lack of treatment trials[2]. It is said to be able to induce sleep and also have some sleep promoting qualities[9]. Hence it is proved that this music has calming effect and tested for blood pressure.

Subjects and Methods:

The study objectives were to assess the level of blood Pressure in Hemodialysis Patients and find out the effect of Effect of Music Therapy on Blood Pressure. True experimental study was used in this study. 58 samples Patients who are hypertensive and are anxious during the procedure of Hemodialysis were selected by Simple random sampling (21 in experimental and 21 in control group) dialysis unit of at Krishna hospital karad. Data collection tool consisted of three sections.

Section 1: Socio Demographic Variables:

Section 2: Blood pressure assessment: Blood pressure classification was done according to following category[8]:

A. In this t Normal: Less than 120/80 mm Hg;
B. Elevated: Systolic between 120-129 *and* diastolic less than 80;
C. Stage 1: Systolic between 130-139 *or* diastolic between 80-89;
D. Stage 2: Systolic at least 140 *or* diastolic at least 90 mm Hg;
E. Hypertensive crisis: Systolic over 180 and/or diastolic over 120,

Prior to the data collection permission was obtained from research ethics committee of KIMSDU. Through simple random sampling 42 patients selected and were assigned to experimental (21) and control group (21). The music intervention consisted of raga Neelambari in the classical Indian Karnatic system of music. Using Mobile head phone or small speaker patients were asked to listen music.

Data collection procedure:

Pretest blood pressure was obtained on the first and second consecutive day of hemodialysis and average of the 1st and 2nd d day were taken as pretest score. After determining the blood pressure, Raga Neelambari in the classical Indian classical system of music was administered to the experimental group of patients. Complete music was made to listen by patients during procedure. Routine care was provided for control group patients. On 4th and 5th haemodialysis day music intervention was provided.

Results: Section I

Table 1: Socio Demographic Variables

Sr No	Socio Demographic Variables	Experiential Group		Control Group	
		F	%	F	%
1	AGE (YEARS)				
	30 – 39	1	5	0	0
	40 – 49	2	10	4	19
	50 – 59	4	19	10	48
	60 – 69	5	23	4	19
	70 & Above	9	42	3	14
2	GENDER				
	Male	11	52	11	52
	Female	10	48	10	48
3	EDUCATIONAL STATUS				
	Primary school	6	29	3	14
	High school	4	19	5	24
	Higher secondary	8	38	7	33
	Graduate	2	10	4	19
	Post Graduate and above	1	5	2	10
4	OCCUPATION				
	Unemployed house wife	6	29	5	24
	Semi skilled worker	4	19	6	29
	Skilled workers	3	14	4	19
	Clerical shop owner	7	33	4	19
	Professionals	1	5	2	10
5	RESIDENTIAL BACKGROUND				
	Urban	9	42	8	38
	Rural	12	58	13	62
6	TYPE OF FAMILY				
	Nuclear	6	29	9	42
	Joint	15	71	12	58
7	INCOME				
	less than 10000	1	5	2	10
	10000 to 20000	8	38	6	29
	20000 to 30000	10	48	9	43
	above 30000	2	10	4	19
8	PREVIOUS EXPIRIENCE WITH MUSIC				
	Yes	2	10	4	20
	No	19	90	17	80

Socio demographic variables shows that in Experimental Group maximum 5 (23%) samples belongs to group of 60 – 69 followed by 4 (19%) between 50 to 59 age. Regarding gender of the patients almost half of male 11 (52%), and female 10 (48%) were selected. 12 (58%) were from rural background for residency. Half of the samples 10 (48%) were having income of 20000 to 30000 where as 8 (38%) were getting income between 10000 to 20000. Only 2(10%) patients were exposed to music therapy previously.

Considering the control group, maximum 10 (48%) samples belong to group between 50 to 59 ages. Regarding gender of the patients almost half of male 11 (52%), and female 10 (48%) were selected. 12 (58%) were belongs to joint family. Half of the samples 9 (43%) were having income of 20000 to 30000 where as 6 (29%) were getting income of between 10000 to 20000. Only 4 (20%) patients were exposed to music therapy previously.

Section II:

A. Blood Pressure Assessment

Stage of Hypertension	**Level of Blood Pressure**	**Experimental group**		**Control group**	
		Pretest	Post test	Pretest	Post test
Normal:	Less than 120/80 mm Hg;	1 (5%)	3 (14%)	2 (10%)	2 (10%)
Elevated:	Systolic 120-129 *and* diastolic < 80;	3 (14%)	7 (33%)	4 (19%)	5 (25%)
Stage 1:	Systolic 130-139 *or* diastolic 80-89;	8 (38%)	9 (43%)	7 (33%)	8 (38%)
Stage 2:	Systolic 140 *or* diastolic at least 90 mm Hg;	9 (43%)	4 (19%)	10 (48%)	9 (43%)
Hypertensive crisis:	Systolic > 180 and/or diastolic >120,	00	00	00	00

During pre test, in the experimental group during pre test, 9 (43%) of the patients had Stage 2 Hypertension, 8 (38%) suffered with Stage 1 Hypertension and 3 (14%) had elevated blood pressure category. Post test score, in the experimental group was 9 (43%) of the samples had Stage 1 Hypertension, 7 (33%) suffered with elevated blood pressure category, and 5 (25%) had stage 2 hypertension.

With regards to control group, during pre test, 10 (48%) of the patients had Stage 2 Hypertension, 7 (33%) suffered with Stage 1 Hypertension and 4 (19%) had elevated blood pressure category. In post test, 9 (43%) of the patients had Stage 2 Hypertension, 8 (38%) suffered with Stage 1 Hypertension and 4 (19%) had elevated blood pressure category. It was clearly noted that no patients were having blood pressure with Systolic over 180 and/or diastolic over 120 which was considered as Hypertensive crisis.

B. Effectiveness of Music on Blood Pressure

Group	**Mean**	**SD**	**Mean difference**	**Unpaired 't' value**	**95% CI**	**P value**
Experimental group			3.1	7.45	4.8-12.1	<0.001
Pretest	128	5.1				
Post test	119	8.2				
Control group			1.2			
Pretest	127	4.42				
Post test	126	5.62				

In the experimental group mean difference were 3.1 and in control group, mean difference was found to be 1.2. In order to calculate and analyze the effectiveness of music therapy in experimental group and control group, an unpaired t test was used and the t'test score was 7.45. It indicates that the listening to music was effectives in normalizing the blood pressure.

Section 4: Association of results with selected socio demographic variables:

Chi-square analysis was used to associate the post-test blood pressure score and the selected socio demographic variables. The "t" value was 5.640 and SD pre test- 0.5561, post test- .8021 shows significant difference between pretest and post test of values at the level $p < 0.001$. Thus, there was significant effect of music therapy on values of blood pressure.

Discussion:

Declines in kidney function are typically associated with rises in blood pressure (BP), and sustained elevations in BP hasten the progression of kidney function decline[18], Furthermore, the prevalence rate of HTN rises, and BP becomes more difficult to control with advancing CKD stage[19]. Many research stated that uncontrolled hypertension is more prevalent among individuals with chronic renal disease with rates ranging from 40% to

70%[20, 21]. In our study it was proved that 38% samples were having Systolic between 130-139 *or* diastolic between 80-89; and 43% patients were having Systolic at least 140 *or* diastolic at least 90 mm Hg which was higher than normal blood pressure. Comparing with others results our shows similar pattern of prevalence of blood pressure. In the experimental mean score were 5.2 with standard deviation 1.96 where as in control group, mean was found to be 3.7 with standard deviation 2.368, the t test score was 3.01 and when it is compared to the table value, was high. It indicates that the listening to music was effectives in normalizing the blood pressure. This effect was also supported by many studies like, Zanini, C.(2009)[29], Barclay, L.(2005)[30] and Solanki, M. S (2013)[31]. Other studies which supports the use of music therapy for the normalizing the blood pressure are Wong HL (2001)[32], Lee O[33], Wiklund I (1997)[34], Shital S[35] and Kharat, D[36].

Conclusion:

The findings reveal that the music therapy is effective in maintaining the blood pressure among patients with Hemodialysis. Hence it could be effective non pharmacological methods for normalizing blood pressure in patients with haemodialysis.

Implications:

Music therapy could be used as a alternative therapy for maintaining equilibrium of both psychological as well as physiological parameters. Especially it works both hospital as well as home setting. There are no side effect of music has been recorded in previous research. There is no specific music which implies effect on blood pressure but any type of music could be used according to patient's selection to minimize hypertension.

If possible it is preferred to use head phone in hospital setting or same music can be played for all patient in speaker for effective use. As per curriculum is concerned there is very limited content is mentioned in any medical and paramedical syllabus regarding use of music as a alternative therapy, which should be provided with effects so that it is widely accepted.

Scope of study: In the present study Raga Neelambari in the classical Indian Karnatic system of music was used. Choice of music is another concern for selection, hence further research can be considered with application of different types of music according to interest of the patients with respect to that geographical variation. As there are limited numbers of patients available in this tertiary care centre, this study can be replicated with large samples.

Conflict of interest: Authors do not have any conflict of interest.

REFERENCES

1. Howson CP, Christianson AC, Modell B. Controlling birth defects: reducing the hidden toll of dying and disabled children in low-income countries. Dis Control Prior Proj. 2008.
2. Singh A, Gupta RK. Pattern of congenital anomalies in newborn: a hospital based prospective study. JK Sci. 2009;1:34–36.
3. Sekhobo JP, Druschel CM. An evaluation of congenital malformations surveillance in New York State: an application of centers for disease control and prevention (CDC) guidelines for evaluating surveillance systems. Public Health Rep. 2001;116:296–305. doi: 10.1016/S0033-3549(04)50051-1.
4. World Health Statistics 2008. Geneva: World Health Organization; 2008.
5. Parmar A, Rathod SP, Patel SV, Patel SM. A study of congenital anomalies in newborn.NIJRM. 2010;1:13–7.
6. Emanuel I, Huang SW, Gutman LT, Yu FC, Lin CC. The incidence of congenital malformations in a Chinese population: the Taipei collaborative study. Teratology.1972;5:159–169. doi: 10.1002/tera.1420050206.
7. Malla BK. One year review study of congenital anatomical malformation at birth in Maternity Hospital (Prasutigriha), Thapathali, Kathmandu. Kathmandu Univ Med J.2007;5(4):557–560.
8. Muga R, Mumah S, Juma P. Congenital malformations among newborns in Kenya. Afr J Food Nutr Sci. 2009;9(3):814–829.
9. Ndibazza J, Lule S, Nampijja M, Mpairwe H, Oduru G, Kiggundu M, Akello M, Muhangi L, Elliott AM. Brief report a description of congenital anomalies among infants in Entebbe, Uganda. Clin Mol Teratol. 2011;91:857–861. doi: 10.1002/bdra.20838.
10. Shawky RM, Sadik DI. Congenital malformations prevalent among Egyptian children and associated risk factors. Egypt J Med Human Genet. 2011;12(1):69–78. doi: 10.1016/j.ejmhg.2011.02.016.

11. Manyama M, Rolian C, Gilyoma J, Magori CC, Mjema K, Mazyala E, Kimwaga E, Hallgrimsson. An assessment of orofacial clefts in Tanzania. BMC Oral Health.2011;11:5. doi: 10.1186/1472-6831-11-5.
12. Moore KL, Persaud TVN. The Developing Human: Clinically Orientated Embryology.Philadelphia: Saunders; 2003. Human birth defects; pp. 157–186.
13. Queißer-Luft A, Spranger J. Congenital malformations. Dtsch Arztebl. 2006;103(38):A 2464–A 2471.
14. Rittler M, López-Camelo J, Castilla EE. Sex ratio and associated risk factors for 50 congenital anomaly types: clues for causal heterogeneity. Birth Defects Res A Clin Mol Teratol. 2004;70(1):13–19. doi: 10.1002/bdra.10131.
15. Fraser FC, Warburton D. No association of emotional stress or vitamin supplement during pregnancy to cleft lip or palate in man. Plast Reconstr Surg. 1964;33:395–399.
16. Strean LP, Peer LA. Stress as an etiologic factor in the development of cleft palate. Plast Reconstr Surg. 1956;18:1–8.
17. Carmichael SL, Shaw GM. Maternal life event stress and congenital anomalies. Epidemiology. 2000 Jan;11(1):30-5
18. Rankin J, Chadwick T, Natarajan M, et al. Maternal exposure to ambient air pollutants and risk of congenital anomalies. Environ Res. 2009;109:181–7.
19. Carmichael SL, Shaw GM. Maternal life event stress and congenital anomalies. Epidemiology. 2000;11:30–35.
20. Hansen D, Lou HC, Olsen J. Serious life events and congenital malformations: a national study with complete follow-up. Lancet. 2000;356:875–880.
21. Suarez L, Cardarelli K, Hendricks K. Maternal stress, social support, and risk of neural tube defects among Mexican Americans. Epidemiology. 2003;14:612–616.
22. Fraser F, Fainstat T. The production of congenital defects in the offspring of pregnant mice treated with cortisone: a progress report. Pediatrics. 1951;8:527–533.
23. Hobel CJ, Dunkel-Schetter C, Roesch SC, et al. Maternal plasma corticotropin-releasing hormone associated with stress at 20 weeks' gestation in pregnancies ending in preterm delivery. Am J Obstet Gynecol. 1999;180(1):S257–S263.
24. Carmichael SL, Shaw GM. Maternal corticosteroid use and orofacial clefts. Am J Med Genet. 1999;86:242–244.
25. Rodriguez-Pinilla E, Martinez-Frias M. Corticosteroids during pregnancy and oral clefts: a case-control study. Teratology. 1998;58:2–5.
26. Khalid et al. Prevalence and Frequency of Congenital Anomalies of the Central Nervous System among Saudian Population KSA-Najran Merit Res. J. Med. Med. Sci. Vol. 5(12) pp. 654-659, December, 2017.
27. Fatema K et al. (2011). Major Congenital Malformations Among The Newborns in BSMMU Hospital. Bangladesh Medical J;40(1):7-12
28. Sunethri Padma et al. (2011). Pattern Of Distribution Of Congenital Anomalies In Stillborn: A Hospital Based Prospective Study'. International Journal Of Pharma And Bio Sciences 2(2):604-610
29. Nayab A, Irshad A, Amir HM, Nazia P (2010). Congenital anomalies: prevalence of congenital abnormalities in 2nd trimester of pregnancy in madina teaching hospital, faisalabad on gray scale ultrasound: jumdc, Vol. 1, Issue 1, Jan-Jun
30. Bahauddin I. Sallout,ab Manal S. Al Hoshan,a Reham A. Attyyaa,a Abdelmane A. Al Suleimata (2008). Antenatal diagnosis, prevalence and outcome of major congenital anomalies in Saudi Arabia: a hospital-based study: Ann Saudi Med 28(4) 36-38.
31. Verma IC. Burden of genetic disorders in India. Indian J Pediatr 2000;67:893-8.
32. Sadler TW. Mechanisms of neural tube closure and defects. Mental Retard Dev Disabil Res Rev 1998;4:247-53
33. Mark D, Phillipa K. Antenatal diagnosis and fetal medicine. In: Rennie JM, editor. Robertson′s Textbook of Neonatology. 4 th ed. Philadelphia: Elsevier; 2005. p. 135-66
34. S. Hussain, I. Asghar, M. Sabir, et al, Prevalence and pattern of congenital malformations among neonates in neonatal unit of a teaching hospitalJ Pak Med Assoc
35. Hiremath P, Patange RP, Salunkhe JA, Mohite VR, Naregal P. Is hormonal contraceptive risk for congenital malformation? Int J Community Med Public Health 2019;6:1784-7.

36. Hiremath P, Patange RP, Salunkhe JA, Mohite VR, Pawar A, Mulani A. Maternal tobacco use and risk for congenital anomalies. Int J Community Med Public Health 2019;6:1472-5.
37. Hiremath P (2016) Need for Psychological Assessment during Pregnancy- A Nursing Perspective. Glob J Nurs Forensic Stud 1: 107. doi: 10.4172/2572-0899.1000107