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Research Article

Music therapy For Hemodialysis Patients

Effect of Music Therapy On Pain Perception, Fatigue Level, And Physiological Variables in Patients Undergoing Hemodialysis- A Prospective Randomized Interventional Trial

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Abstract: Chronic renal failure (CRF) is a severe and chronic illness that can significantly impact a person's quality of life. It is caused by various pathologies and can lead to multiple complications, including fatigue and chronic pain. Hemodialysis is a standard and lifesaving treatment for patients with CRF, but the prolonged immobilization required during this procedure can exacerbate fatigue and pain. Music therapy is a non-invasive treatment that has positively impacted patients undergoing hemodialysis. In the study we have done, the therapy consisted of passive listening and active participation in the form of deep breathing for eight weeks. To provide music therapy based on client preference to patients undergoing hemodialysis for chronic renal failure. To observe the fatigue and subjective pain perception level after eight weeks of musical intervention.The sessions began with a warm-up session of OM chanting, which was used to set the atmosphere and bring attention to the subject. Then, devotional songs were played for 10 minutes based on the patient's preferences, followed by 20 minutes of Indian classical Veena music. The therapy sessions were administered every third day, twice a week when the patients underwent hemodialysis. Each session lasted around 3 hours. Subjective parameters of fatigue and pain perception were assessed before the intervention, after four weeks, and after eight weeks of musical intervention. The results indicated that music therapy lowered these patients' fatigue and pain perception. The fatigue level, estimated by the CIS (Checklist Individual Strength) score, was reduced by 30%, and the pain perception score dropped from 8 to 6.5. The findings of this study suggest that music therapy can be an effective complementary treatment for patients undergoing hemodialysis, as it can help to reduce fatigue and pain perception. It is essential because these symptoms can significantly impact patients' quality of life and may impact adherence to treatment regimens. However, it's also worth noting that this study only assesses the effect in a small sample size. For a short period, more research is needed in a larger population with a longer duration. Exploring different music or other therapeutic techniques is also beneficial to find the most effective approach for individual patients.

Keywords: Chronic Renal Failure, Hemodialysis, Non-Pharmacological, Music Therapy. Pain, Fatigue

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1. INTRODUCTION

Chronic renal failure (CRF) is a chronic and debilitating illness that can significantly impact a person's quality of life. It is caused by various pathologies and can lead to multiple complications, including fatigue and chronic pain. Dialysis is a standard and lifesaving treatment for patients with CRF, but the chronicity of the illness and the dialysis process can cause immense psychological trauma for patients. As a result, the clinical manifestation of CRF is physical and psychological[1,2]. In addition, patients diagnosed with CRF undergoing interventional procedures such as hemodialysis often have a high level of depression and fatigue, according to studies conducted by the Oxford Journal of Nephrology[3]. However, it highlights the need for a management strategy incorporating the psychosomatic aspect of the illness to improve patients' quality of life. One way to address the psychosomatic aspect of CRF is by using complementary and alternative medicine (CAM) therapies. Music therapy is one form of CAM that has been found to improve the psychological status of patients suffering from chronic illness. Researchers have documented that relaxing music can reduce depression and alter fatigue by establishing positive emotions. In addition, music therapy has been shown to shift the autonomic balance towards a parasympathetic shift, which can improve cardiorespiratory functions[4-6]. The study is planned to give relaxing music to CRF patients undergoing hemodialysis and assess the effect of music therapy on fatigue levels and pain perception. Previous studies have shown that patient-preferred music results in better outcomes and musical preferences also depend on an individual's personality and intelligence quotient. Therefore, the music therapy process will be designed based on the patient's preferences. The study's objectives are: To provide music therapy based on client preference to patients undergoing hemodialysis for chronic renal failure. To observe the fatigue and subjective pain perception level after eight weeks of musical intervention. As we know, CRF patients suffer various physical and psychological issues during the treatment of dialysis, Music therapy is an effective way to address the psychological aspect of this illness. Providing music therapy based on patient preference allows patients to feel more in control of their treatment and can promote positive emotions. The study's results can help to improve the overall quality of life for patients with CRF who are undergoing hemodialysis.[7-10] It is also important to note that this study only assesses the effect in a small sample size and for a short period of time so more research is needed in a larger population with a longer duration. It may also be beneficial to explore the use of different types of music or different therapeutic techniques to find the most effective approach for individual patients. In this way, it will be helpful to tailor the music therapy sessions to fit best the patient's needs, which can lead to better outcomes.

2. METHODOLOGY

It was an interventional cross-control trial conducted by the School of Music Therapy, Institute of Salutogenesis and Complementary Medicine, in collaboration with the Department of Nephrology of a south Indian medical university. The study was permitted by the Institutional Human Ethical Committee (IHEC clearance: FACULTY /2015/12, ECR/415/ Inst /PY/2013). Subjects fulfilling the inclusion criteria were recruited after explaining the music therapy intervention, and informed consent was obtained for utilizing the data for research.

2.1 Inclusion criteria

Patients are aged 30 - 70 years of both sexes, undergoing dialysis at the above-mentioned dialysis unit for chronic renal failure.

2.2 Exclusion criteria

Critically ill patients, patients on dialysis for acute renal failure, patients with hard of hearing, and those unwilling to experience musical intervention.

2.3 Sampling and randomization

The total 36 patients undergoing dialysis in the center were grouped into two sets of 18 patients each. The groups were divided with the sealed envelope technique so that each participant could have an equal chance in either group. Per day twelve patients, six in the forenoon and six in the afternoon, undergo dialysis. Every day the patient spends around 3 hours in the process of hemodialysis. The dialysis process was repeated every third day so that every patient received two weekly sessions. The second group was the control group which did not receive any intervention.

2.4 Intervention

Music Therapy interventions were carried out in the dialysis room which was made soundproof without extraneous noise. The subjects' musical preference was assessed during enrolment. All the subjects belong to the same ethnic and socio-economic background. They preferred hearing devotional songs, which are culturally deep-seated to have healing power. The therapist began with a warm-up session of OM chanting to set the atmosphere and bring attention to the subject. Devotional songs were sung for 10 minutes as the subjects preferred to hear them, followed by Indian classical Veena music by the therapist for 20 minutes. Music therapy sessions are administered every third day twice a week when the patients undergo hemodialysis. Patients spend around 3 hours per dialysis session. Hence after allowing an hour for stabilization, the basal parameters were recorded. Fig 1A and 1 B

Fig 1 A – veena recital and hemodialyses patients
B – music intervention

2.5 Assessment

Study parameters (outcome measures) were monitored pre-intervention, midsession, and post-music therapy assessment (at the end of two months). The parameters assessed were CIS(Checklist for Individual Strength) and pain perception by a numeric scale. CIS is a validated Likert scale of 20 questions.[11] A few researchers used this to assess the basal fatigue level of subjects and monitor any difference after the intervention. Vercoulen formulated it, and the content validity was tested by Anna J H M Bearskins et al.[12] The reference range of fatigue level was derived from the study conducted by Ms. Linu Zachariah et al. to evaluate the music therapy benefits. [13] The help of close relatives was sought for a few patients who could not fill out the questionnaire.

Table I: Range of fatigue level	
Normal fatigue level	score < 27
Elevated fatigue level	28-35
Severe fatigue	≥ 36

Zachariah M et al. [13]

3. STATISTICAL ANALYSIS

The blinded staff nurse determined the pain perception level. A numeric scale that grades pain from level 0-10 where zero indicates no pain and 10 indicates severe pain. ANOVA analyzed the pre, midsession, and post-interventional data for significance ($p<0.05$, CI 95%). Considering a 20 % reduction in fatigue scores and the alpha value of 0.05 and beta value of 80 %, a sample size of 30 was needed. We recruited more to overcome dropouts.

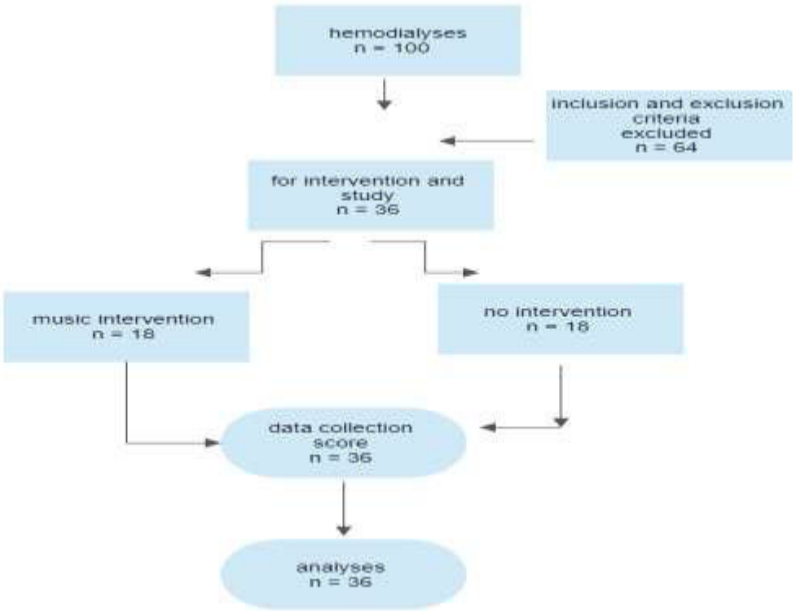

Fig 2: showing study flow chart

4. RESULTS

The assessment of individual strength, as reflected by the fatigue level, was equal in both control and interventional group pre-music therapy. After four weeks, the intervention group's fatigue level reduced from a mean score of 42 to 27. At the end of 8 weeks, the reduced fatigue level was maintained.

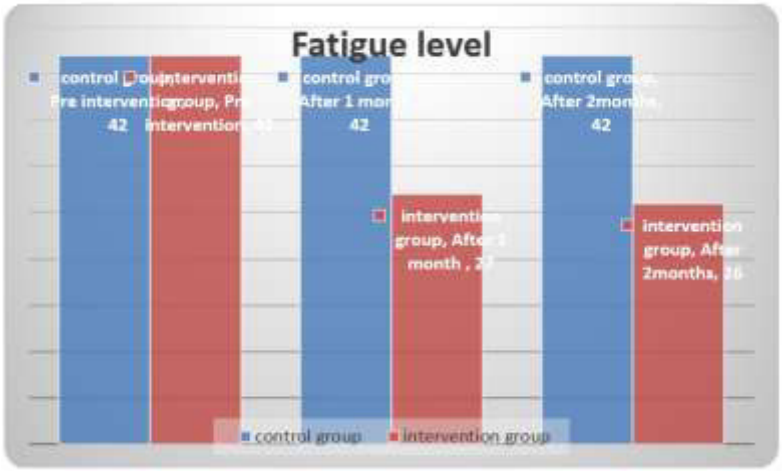

Fig: 2 Checklist for Individual Strength

CIS scale data (Fatigue level):

A numeric scale estimated pain perception from 0 to 10. It was equal in both groups during the initiation of the session. However, in the middle, i.e., after four weeks, it reduced from a mean score of 6 to a mean score of 4 for the music therapy group. The reduced score was sustained after eight weeks which is the end of the intervention.

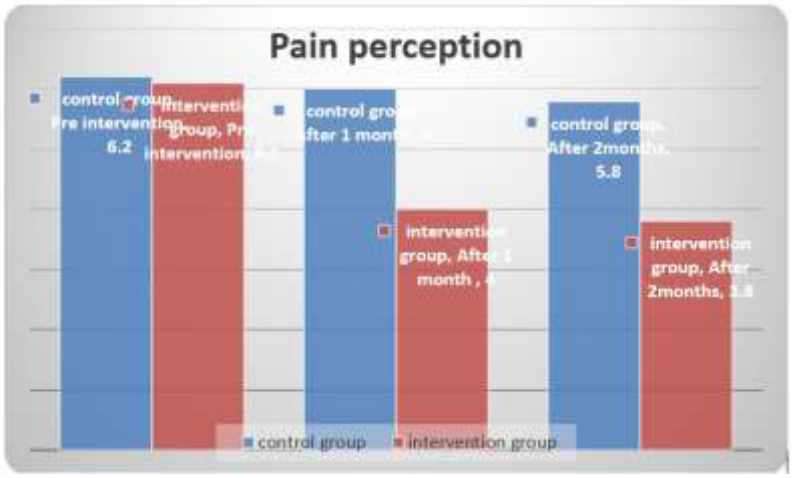

Fig 3: Pain perception.

5. DISCUSSION

Results of our study showed a positive impact on the subjective parameters, fatigue level, and pain perception of chronic renal failure patients on hemodialysis. The patient experiences pain and psychological discomfort as the intravenous line is patent throughout the dialysis session. As the process is chronically repeated undergoing the procedure, the disability caused by the electrolyte disturbance cumulatively increases the fatigue level. The fatigue level reflected by the individual strength score improved at the mid-session of musical intervention and was sustained until the end. Pain perception also reduced during the mid-session and sustained until termination of intervention. Hence, the beneficial effect of music was not short-lived but prolonged. Literature shows evidence of musical intervention during procedural support. Sobana et al. report the effect of client-preferred music during GI endoscopy procedures.[14] There was better patient cooperation with the procedure on music.[15] Augustin P et al. used music during the post-operative surgical phase and observed an anxiety reduction.[16,17] Music medicine as raga music, was given to cancer patients with recorded benefits.[18,19] The anxiolytic effect of music was reported beneficial in prehypertensive patients as well.[20]. The autonomic modulations of music leading to a vagal predominance is postulated as the mechanism behind musical benefits.[20] The results of our study are supported by the systematic review of music therapy in the anxiety of renal failure patients by Burrai

et al.[21] The review confirms the positive impact of music on subjective parameters of anxiety. Another study by Hageman et al. evaluated the depression level of renal failure patients. The impact was reported to be satisfactory.[23] Ramesh et al. documented the benefits of music in the subjective parameters of satisfaction and pain perception.[24,25] Correlating our result with the literature evidence we could infer that musical intervention of patient preference would benefit such patients' subjective parameters. Improving subjective well-being is critical for a patient with a chronic debilitating illness such as chronic renal failure.

6. CONCLUSION

Chronic renal failure (CRF) is a debilitating illness that can result in complications, including fatigue and pain. Hemodialysis is a standard treatment for CRF, but it can exacerbate these symptoms. A study has found that music therapy, in the form of passive listening and active participation through deep breathing, can effectively reduce fatigue and pain perception in hemodialysis patients. The study administered therapy sessions with warm-ups, devotional songs, and Indian classical music based on patient preference. The therapy was administered twice a week for eight weeks. The study showed that the fatigue level was reduced by 30% and pain perception dropped from 8 to 6.5; however, it was done in a small sample size, and more research is needed to explore the effects on a larger population with a longer duration.

7. ACKNOWLEDGEMENT

Music therapy interventions were structured and delivered by qualified music therapists of the School of Music Therapy, Institute of Salutogenesis and Complementary Medicine, Sri Balaji Vidyapeeth.

8. AUTHOR CONTRIBUTION STATEMENT

Sobana. R has designed the concept. Jai Ganesh. K has done the data collection Parthasarathy.S has done the write-up and communication.

9. CONFLICT OF INTEREST

Conflict of interest declared none.

10. REFERENCES

1. Dash SC, Agarwal SK. Incidence of chronic kidney disease in India. Dial Transplant. 2006;21(1):232-3. doi: 10.1093/ndt/gfi094.
2. Agarwal SK, Dash SC, Irshad M, Raju S, Sing R, Pandey RM. Prevalence of chronic renal failure in adults in Delhi, India Oxford. J Med Nephrol Dial Transplant. 2008;20(8):1638-42.
3. Abebe A, Kumela K, Belay M, Kebede B, Wobie Y. Mortality and predictors of acute kidney injury in adults: a hospital-based prospective observational study. Sci Rep. 2021;11(1):15672. doi: 10.1038/s41598-021-94946-3, PMID 34341369.
4. Angella Bascom M, Breiner MB, Cantwell MF, Chester EA, Cline JL, et al. Professional guide to complementary and alternative therapies. 2st Pensylvania, editor. Springhouse;2002. p. 348-52.
5. Martinez JJ. Is music therapy? Nephrol Nurs J. May-June 2009:54-9.
6. Sobana R, Jai Ganesh K, Kuzhandaivelu A. Cross-Sectional study on the autonomic modulations produced by music listening in anxious medical professionals. Res J Pharm Biol Chem Sci. 2014;5(3):2039-43.
7. Steelman VM. Intraoperative music therapy affects anxiety and blood pressure. AORN. 1990;52(5):1026-34. doi: 10.1016/s0001-2092(07)69164-9, PMID 2264730.
8. Lee KS, Jeong HC, Yim JE, Jeon MY. Effects of music therapy on the cardiovascular and autonomic nervous system in stress-induced university students: A randomized controlled trial. J Altern Complement Med. 2016 January;22(1):59-65. doi: 10.1089/acm.2015.0079, PMID 26669417.
9. Sobana R, Jai Ganesh K. A study on the relationship between music therapy and neuroticism and agreeableness personality traits, National. J Res Community Med. 2013, 1 -78;2(1):39-43.
10. Sobana R, Jai Ganesh K. Prognosis in music therapy intervention is associated with emotional intelligence-alexithymia spectrum. Antiseptic. June 2013:292-4.
11. Bültmann U, de Vries M, Beurskens AJ, Bleijenberg G, Vercoulen JH, Kant I. Measurement of prolonged fatigue in the working population: determination of a cutoff point for the individual checklist strength. J Occup Health Psychol. 2000 October;5(4):411-6. doi: 10.1037//1076-8998.5.4.411, PMID 11051524.
12. Beurskens AJ, Bültmann U, Kant I, Vercoulen JH, Bleijenberg G, Swaen GM. Fatigue among working people: validity of a questionnaire measure. Occup Environ Med. 2000;57(5):353-7. doi: 10.1136/oem.57.5.353, PMID 10769302.
13. Lin YJ, Lu KC, Chen CM, Chang CC. The effect of music as therapy on the overall well-being of elderly patients on maintenance hemodialysis. Biol Res Nurs. 2012-14.Jull 14(3):277-28.
14. Sobana R, Sumathy S, Dixit P. A study on the effects of music therapy in patients posted for upper gastrointestinal endoscopy. Int J Pharm Bo Sci. 2015;6(2):307.
15. Augustin P, Hains AA. Effect of music on ambulatory surgery patients' post-operative anxiety. AORN. 1996;63(4):750-8.http://find. doi: 10.1016/S0001-2092(06)63126-8.
16. Varghese JK, Sundar S, Sarkar S, Ezhumalai G. Effect of adjuvant music therapy on anxiety, depressive symptoms, and cognitive functions of patients receiving electroconvulsive therapy: A preliminary study. J Basic Clin Appl Health Sci. 2019;2(4):142-5. doi: 10.5005/jp-journals-10082-02225.
17. Ajmera S, Sundar S, Amirtha Ganesh B, Bhavanani AB, Dayanidi G, Ezhumalai G. A comparative study on the

effect of music therapy alone and a combination of music & yoga therapies on the psychophysiological parameters of cardiac patients posted for angiography. J Basic Clin Appl Health Sci. 2018;2:163-8.
18. Bharathi P, Jaiganesh K, Sobana R, Parthasarathy S. Effect of Indian Raga Bageshri on the body temperature of a cancer patient on chemotherapy.International Journal of Current Scientific Research. Int J Cur Sci Res. 2012;2(1):243-5.
19. Bharathi. P, Sobana R, Jai Ganesh K, Effect of Rag Neelambari on certain physiological and behavioral parameters of preterm infants. Asian J Pediatr Pract. 2012;16(2).
20. Sobana R, Jai Ganesh K. Role of Rag Ahir Bhariav as CAM on blood pressure in pre hypertensives. Med Sci Technol. 2013;2(2):66-70. \.
21. Burrai F, Forton Magavern E, Micheluzzi V, Magnaghi C, Apuzzo L, Brioni E. Effectiveness of music to improve anxiety in hemodialysis patients: A systematic review and meta-analysis. Holist Nurs Pract. 2020 November/12;34(6):324-33. doi: 10.1097/HNP.0000000000000411, PMID 33060495.
22. Sobana R, Sundar S, Jaiganesh K. Music therapy for pulmonary rehabilitation in chronic obstructive pulmonary disease [COPD] patients- an interventional trial. Int J Curr Res Rev | Vol 12 • Issue 12 • June 2020. 2020;12(12):26-9. doi: 10.31782/IJCRR.2020.12126.
23. Hagemann PMS, Martin LC, Neme CMB. The effect of music therapy on hemodialysis patients' quality of life and depression symptoms. J Bras Nefrol. 2019;41(1):74-82. doi: 10.1590/2175-8239-JBN-2018-0023, PMID 30222176.
24. Bhuvaneswari Ramesh B, Sundar S, Ghose S, Damodaran G, Balasubramanian S, Govindasamy E. Evaluating the effect of music therapy on the establishment of lactogenesis and maternal breastfeeding satisfaction levels. Int.J.Med. J Health Res. 2020;6:05-9.
25. Ramesh B, Sundar S, Jayapreeta R, Samal S, Ghose S. Effects of Culture-Based Chants on Labour pain during the Latent Stage of Labour in Primigravidae Mothers: A randomized controlled trial. J Basic Clin Appl Health Sci. 2018;2(1):16-9.