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Original Article

Effectiveness Music Therapy On Hemodialysis Patients: Scooping Review

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Abstract

Background: Music can provide relaxation to the listener and it has become a therapeutic effect. Listening to music during hemodialysis sessions can induce blood pressure, heart rate, respiratory rate, temperature changes, and serum free fatty acids which have beneficial effects on the body's metabolism

Aims: to evaluate the effectiveness music therapy to patients undergoing hemodialysis.

Design: Search articles using Scopus, Science Direct, PubMed, and Springer link. Articles identified using keywords music AND (therapy or interaction) AND hemodialysis published on 2014 -2018 and found 112 articles.

Results: All articles were reviewed using a randomized controlled trial (RCT) design by reviewing the parameters of anxiety, depression, sleep quality, pain level, and vital parameters of music therapy intervention.

Conclusion: music therapy has a significant effect when measured by parameters of anxiety, depression, sleep quality, pain level, vital parameters.

KEYWORD: music therapy, hemodialysis, anxiety, depression, sleep quality, pain level, and vital parameter

INTRODUCTION

Dialysis is part of the treatment in CKD patients in an effort to maintain the metabolism of the kidney which consists of peritoneal dialysis and hemodialysis (1). Hemodialysis is provided given regularly for patients with End Stage Renal Disease (ESRD) in dialysis service facilities to remove the waste products of the body's metabolism and regulate the volume of fluids in the body (2). Hemodialysis in addition to reducing the signs and symptoms of CKD can also increase life expectancy. but there are various psychological and physiological problems that affect the quality of life of hemodialysis patients (3). Psychological problems that are often experienced by patients are anxiety, stress, and depression caused by hemodialysis treatments such as drug and diet therapy, hospitalization, HD regimens, changes in social environment (4). Patients who experience psychological problems due to hemodialysis can directly affect their quality of life (QOL) (5). The QOL that is often disturbed

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in hemodialysis patients is poor sleep quality, more than 80% of CKD patients undergoing hemodialysis experience sleep disorders (3). Nurses play an important role in the care of CKD patients undergoing hemodialysis. The comprehensive and collaborative effort to minimize the psychological and physiological effects of hemodialysis patients will be very necessary, so treatment that can improve the quality of life in ESRD patient undergoing hemodialysis programs still need to explored .

One of the complementary interventions to reduce psychological problems and sleep quality of hemodialysis patients by using music (3). Music can provide a relaxation phase to the listener so that it has a therapeutic effect (5). Music listened to during hemodialysis sessions can induce changes in vital sign and serum free fatty acids that give positive effects on the body's metabolism. Music has a lowering effect on cortisol levels, which means music therapy can relieve mental stress, and decrease cortisol release (6). This study aims to determine the effectiveness of music therapy on hemodialysis patients.

METHODS

Article Search Strategy

The method was initiated by searching for articles in the Scopus, Science Direct, PubMed, and Springerlink databases. Articles identified using keywords music AND (therapy or intervention) AND hemodialysis published in 2014 - 2018. A total of 271 articles were found and 81 articles relevant, 67 articles due to inappropriate research design, and 6 articles due to duplication. Up to 8 articles were selected to be reviewed in this systematic review (Figure 1).

Article Selection Criteria

The criteria for the articles are: 1) RCT and/or crossover studies; 2) music is used as the main intervention and there is no specific type of music; 3) hemodialysis patients.

RESULTS

Research design

All articles reviewed used randomized controlled trials (RCT) designs.

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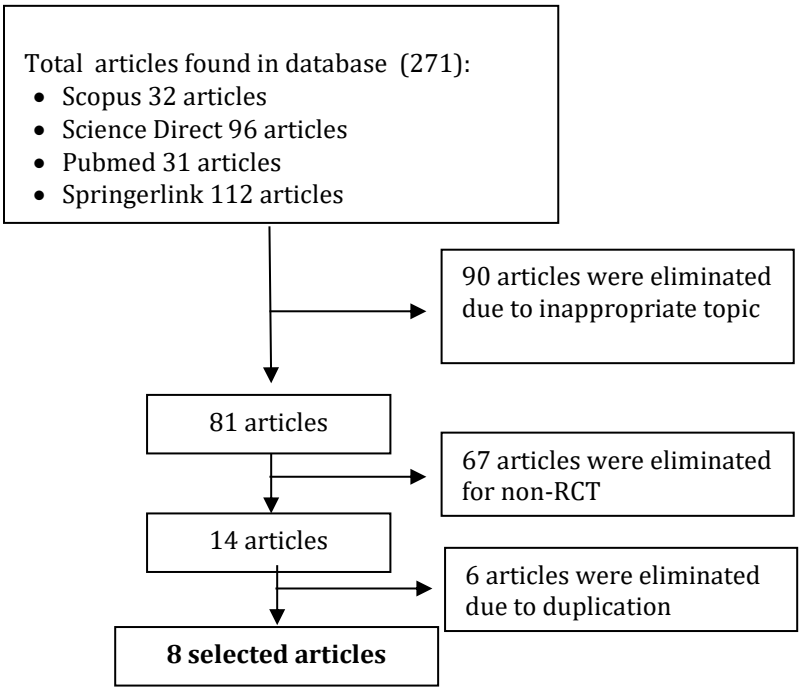

Figure 1. Literature search flow diagram

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Table of Review

No.	Title & Authors	Study design	Population	Intervention	Control or Comparison	Outcomes Analyzed	Time Frame Measurement	Result
1	Comparing the effect of listening to music during hemodialysis and at bedtime on sleep quality of hemodialysis patients (3)	Randomized Controlled Trial	150 patients undergoing hemodialysis	listened to music during hemodialysis, and listened to music at bedtime	The control group received no intervention	Sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI) during two stages (before and one week after the intervention)	4 weeks	effectively improve sleep
2.	Effects of Listening to Live Singing in Patients Undergoing Hemodialysis (7)	Randomized Controlled Crossover	24 participants with a diagnosis of end-stage kidney disease	12 patients listened to 15 min of live singing during 6 consecutive hemodialysis sessions	underwent standard hemodialysis	Blood Presure monitor; Short Form–12 (SF-12) questionnaire; Depression Scale (HADS); Pittsburgh Sleep Quality Index (PSQI); Visual Analogue Scale (VAS)	6 hemodialysis sessions	Listening to live music was associated with improvements in systolic and diastolic blood pressure, quality of sleep, fewer cramps, and reduced anxiety, pain, and itching ($p < .05$, all values)
3	Effects of live saxophone music on physiological parameters, pain, mood and itching levels in patients undergoing haemodialysis	Randomized Controlled Study	114 patients undergoing haemodialysis	57 patients who received 30 minutes of live saxophone music therapy	57 patients who received participants were allowed to choose five or six musical pieces of different styles	Physiological parameters: systolic BP, diastolic BP, heart rate, glycaemia and oxygen saturation.	4 weeks	The experimental group showed a statistically significant reduction in pain level, and an improvement in mood and

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No.	Title & Authors	Study design	Population	Intervention	Control or Comparison	Outcomes Analyzed	Time Frame Measurement	Result
	(8)					Pain level, using the Visual Analogue Scale for pain (VASP)		itching levels and in the oxygen saturation.
4	Effects of music on complications during hemodialysis for chronic renal failure patients (4)	Case control study	60 patients diagnosed with end-stage renal desease undergoing hemodialysis treatment	30 patients in intervention group listened 30 minutes in each session (12 total sessions)	the control group were taken routine care	Visual Analogue Scale (VAS)	12 hemodialysis sessions	The intervention group's scores of pain and nausea were lower than the control group for all 12 sessions was significant (P < 0.05)
5	Music therapy-induced changes in salivary cortisol level are predictive of cardiovascular mortality in patients under maintenance hemodialysis (6)	Randomized Controlled Trial	99 patients on maintenance HD	The experimental group received relaxing music therapy	the control group received no music	Physiological indicators; hemodialysis stressor scale (HSS); and salivary cortisol measurement	1 week	The salivary cortisol level was lowered after 1 week of music therapy in the experimental group
6	Musical intervention on anxiety and vital parameters of chronic renal patients (9)	Randomized Controlled Trial	60 people with chronic kidney disease undergoing hemodialysis	Received musical therapy	Received standard care from the renal replacement therapy clinic where	anxiety through the *Stait-Trait Anxiety Inventory (*STAI) and vital parameters	30 minutes	statistically signifcant reduction of anxiety, systolic and diastolic blood pressure, heart rate and respiratory rate

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No.	Title & Authors	Study design	Population	Intervention	Control or Comparison	Outcomes Analyzed	Time Frame Measurement	Result
					hemodialysis is performed			after listening to music in The experimental group
7	The effect of music therapy on hemodialysis patients' quality of life and depression symptoms (5)	Study Intervention	23 hemodialysis patients	Received musical therapy	-	QOL and depression symptoms	Eight sessions of music therapy were conducted, with two weekly sessions and an average duration of 75 minutes	Significant reduction in depression symptoms ($p < 0.001$) and better QOL results
8	The Effects of Selected Relaxing Music on Anxiety and Depression during Hemodialysis (10)	crossover clinical trial	102 patients undergoing hemodialysis	three-hour relaxing music during hemodialysis	the same headphones were available but no music was played with the same procedure with the intervention group	Depression Beck Depression Inventory-II (BDI-II) and anxiety State-Trait Anxiety Inventory (STAI)	2 weeks and three hours this process	Not any significant difference in BDI-II ($P = 0.253$) and T-anxiety ($P = 0.546$) between the two groups after hemodialysis. significant difference was observed between two groups regarding s-anxiety ($P = 0.021$).

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Anxiety

Music intervention given to patients who are undergoing hemodialysis with anxiety assessment parameters there are 3 articles. From 2 articles, it was stated that music therapy given by hemodialysis patients significantly reduced anxiety, while in 1 article there was a significant difference, but the difference was not significant.

Cantekin and Tan (2013) in their research found that the mean of pre- and post-therapy tests for anxiety was statistically significant. It was found in the experimental group that the score of psychosocial stressor decreased after intervension was given with statistically significant (11). Another finding that the score of physiological stress felt by the experimental group patients decreased after music therapy was given with statistically significant. Reduction in anxiety scores ($p = 0.03$) in hemodialysis patients after listening to music (9). In a study conducted by Salehi et al (2016) listening to music during hemodialysis sessions in patients undergoing hemodialysis 3 times a week with a duration of time listening to music of 30-60 minutes. statistically the anxiety value after hemodialysis with music and without music had a significant effect ($P = 0.001$) (10).

Depression

There is 1 article that mentions giving music therapy to hemodialysis patients with significant results in depression. 1 article mentions giving music therapy to depression in hemodialysis patients is not significant. Research by Burrai et al (2018) obtained a statistical value ($p < 0.001$) meaning that in the experimental group given direct music therapy there was a decrease in the level of depression (7). When assessing depression using the Beck Depression Inventory (BDI-II) there was no significant relationship between listening to music and BDI-II ($P = 0.213$)(10).

Sleep Quality

Two articles that assessed sleep quality when given music therapy were statistically significant that music can improve the quality of sleep on patients with hemodialysis. Listening to music at bedtime while the patient is undergoing hemodialysis procedures is more effective. There was a significant difference in PSQI score before and after the intervention between intervention groups and control groups and between the two intervention groups ($p < 0.05$). In the PSQI subscale were Significant differences, except for sleep adequacy ($p < 0.05$) (3).

Research conducted by Burrai et al (2018) showed the quality of sleep parameter a significant increase in t ($p <0.001$) in the intervention group who were given live singing music therapy during hemodialysis (7).

Pain Level

Three articles discussing music on pain levels stated statistically significant results. Koca Kutlu and Eren (2014) mention that music therapy given to hemodialysis patients can reduce pain scores, the average pain score of the intervention group is lower than the

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average pain score of the control group (4) . Live music therapy also has a significant effect on reducing pain in hemodialysis patients (7).

Research conducted by Burrai et al (2014) in their study also showed a significant reduction in pain ($p < 0.05$), music therapy has an effect to inhibiting the transmission of pain signals sent to the brain so that patients who listen to music will have reduced pain perception (7).

Vital Parameters

Among the 4 articles, 3 articles stated that music therapy had a statistically significant effect. In the study of Burrai et al (2018), it was stated that there was a significantly higher post-test diastolic difference when given music intervention, systolic and diastolic blood pressure showed a significant ($p < .001$) correlation between pre and post hemodialysis values for both conditions. An increase in diastolic blood pressure indicates that listening to music can give effect in the mean blood pressure values of patients with hemodialysis. In the general hemodialysis population, there were greater fluctuations in arterial pressure compared to this study population treated with live music intervention (12) (7,13,14). The average diastolic pressure in the control group was slightly lower than the experimental group who listened to music during hemodialysis therapy with statistical significance ($P = 0.049$) (6). Melo et al (2018) The experimental group presented statistically significant reductions in systolic ($p < 0.002$) and diastolic blood pressure ($p < 0.002$), heart rate ($p < 0.01$) and respiratory rate ($p < 0.006$) after listening to music (9).

DISCUSSION

This review was to assess the effectiveness of music intervention given to hemodialysis patients. There are several findings related to music therapy intervention on several parameters of hemodialysis patients that are measured, several parameters that are measured in the provision of effective music therapy for hemodialysis patients which will be discussed in detail as follows. Music therapy that is done directly can increase diastolic blood pressure (BP), which shows that listening to music has an effect on blood pressure to patients with hemodialysis, there were greater fluctuations in arterial pressure compared to population with live music intervention (12) (7,13,14).

The high prevalence of sleep disturbances and poor sleep quality in HD patients. This study shows that music has a positive effect on the patient's nighttime sleep quality. However, HD patients who listened to music before bed had a better quality of sleep because of stress factors and environmental disturbances during HD is very different from a relaxed state before sleeping at night at home. Listening to music at bedtime can relaxation while the person is asleep. Can be non-pharmacological intervention for adults suffering from insomnia. The type of music is an important factor, so the mechanism of music's effect on sleep to be developed more (3).

In HD patients with pain complaints who are given music therapy, it requires concentration so that it can change the transmission of pain impulses in the spinal cord, also competes with

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other peripheral nerve impulses, which come from the SNP to the CNS, transfers brain focus from nociceptors to sound signals, resulting in an environment external factors that increase pain perception, increase endorphins, and pain-related thoughts and enhance musical enjoyment(7).

CONCLUSION

The review from the above review is that music therapy has a positive effect when measured by the parameters perceived by hemodialysis patients. The hemodialysis parameters are anxiety, depression, sleep quality, pain level and vital parameters. There should be a lot of research related to music therapy given to hemodialysis patients related to physiological and psychological problems. Need attention to the elements of universality and cross culture in the implementation of music therapy. Further assessment of the music making background is needed, especially the emotional message that will be conveyed in music because there is a role and culture different.

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