

Background Information

The CDC estimates approximately 726,000 Americans receive dialysis each year. Individuals in need of dialysis often have a poorer quality of life, in part due to physiological and psychological complications associated with kidney failure. These include high BP, pain, anxiety and depression. Music medicine (music listening programs) and music therapy have both been shown to ameliorate these symptoms among individuals with other chronic and life limiting illnesses. The purpose of this systematic review is to identify and compare the effect of music medicine and music therapy on physiological and psychological outcomes in adults (age 18 and older) who have chronic or end-stage renal disease.

Search Strategy

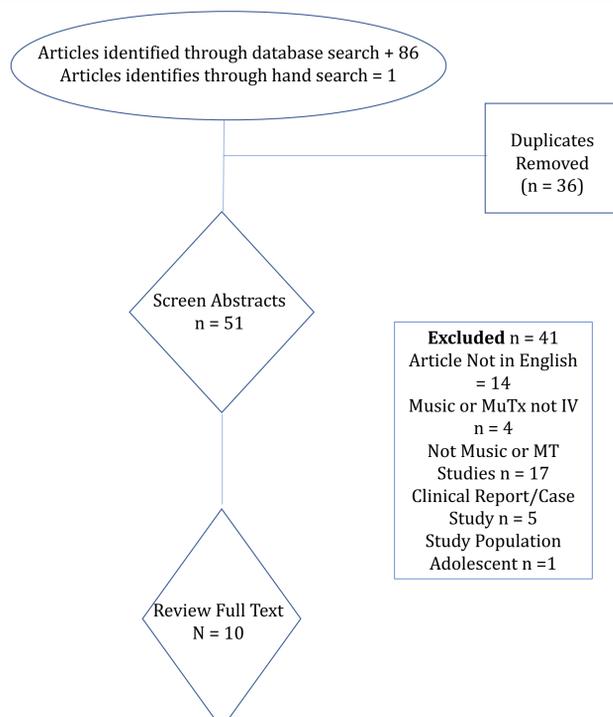
CINAHL, Medline, PsychInfo, and RILM were searched using following search terms: music and end-stage renal disease, music and end-stage kidney disease, music and kidney disease, music and hemodialysis, and music and peritoneal dialysis

Inclusion Criteria

Studies that met the following criteria were included in this review:

- Research questions were relevant to the identified purpose
- Used an experimental design and collected quantitative data
- Study Participants were 1) 18 years of age or older; 2) diagnosed with chronic or end-state renal disease; and 3) required and received dialysis at an outpatient dialysis center.
- The study included either a music medicine or music therapy method
- Reported results on physiological or psychological outcomes
- The music medicine or music therapy method used was described

Study Selection Flow Chart



Characteristics of Included Studies

Author(s) (Published Year)	Sample Size		Research Design	MM or MT	DV	Description	Duration	Control Intervention
	EG	CG						
Binson et al (2013)	54	--	Crossover Pre/Post	MT	SBP, DBP; HR, Pain, Anxiety	5 minute breathing exercise; 7 minutes listening to preferred music or 7 minutes participating in music experience (singing along or strumming omnichord); 3 minutes oral evaluation	2 15 minute sessions a week apart	Routine HD
Burrai et al (2014)	57	57	RCT	MM	SBP; DBP; HR, glycaemia, O ₂ sat, pain, mood, itching	Researcher played saxophone for 30 minutes during dialysis	4 weeks	Routine HD
Cantekin & Tan (2013)	49	50	Prospective RCT	MM	Physiological & psychological stressors; anxiety	Patients in EG were given MP3 players with preloaded Turkish art music songs they could listen to when they wanted	3 sessions over 1 week for 30 minutes	Routine HD
Hou, Lin, Lu, Chiang, Chang, & Yang (2017)	49	50	RCT	MM	Stress, SBP; DBP; RR, Finger temperature, O ₂ sat, salivary cortisol, CBC	Patients listened to preferred music via headphones	Listened to music the 1 st 20 minutes of every hour; last 20 minutes of 4th hours	Routine HD
Koca Kutlu & Erne (2014)	30	30	RCT	MM	SBP; DBP; hemodialysis parameters; pain, nausea, vomiting, cramps	Patients listened to instrumental (violin & piano) Turkish art music during the 3 rd hour of the session for 30 minutes.	30 minutes of music during the 3 rd hour of dialysis for 12 weeks	Routine HD
Lin et al (2012)	44	44	RCT	MM	Stress, SBP; DBP; HR, RR, Finger temperature, O ₂ sat	Patients preferred melodic instrumental music recorded on CD; listened to music 1 st 20 minutes of each hour for the 1 st 3 hours; 20 minutes at the end of the 4 th hour	2 weeks	Routine HD
Luna & Nosek, (2011)	19	--	Crossover	MM	Pain	Patients listened to music for a total of four treatment events	Not indicated	Routine HD
Pothoulake et al (2008)	30	30	RCT	MM	Anxiety; pain;	Patients selected music to listen to from a music collection provided by the researcher or their own CD	Time not indicated; participants listened during dialysis	Routine HD w/ usual activities such as watching TV, reading, and sleeping
Salehi et al. (2016)	83	83	Crossover	MM	Anxiety; depression	Patients received a 3-hour relaxing music downloaded into a Leono mp3 player and JVC headphones. Duration of listening ranged from 20 minutes to 180 minutes	Duration of listening ranged from 20 minutes to 180 minutes	Routine HD while wearing headphones, no music playing
Schuster (1985)	31	32	Randomized Experimental Design	MM	SBP; DBP;	Patient selected music from therapist selected cassette tapes; earphones	30 minutes no music 1 hour no music, 1 hour music	Routine HD

Notes: EG= Experimental Group; CG = Control Group; RCT = Randomized Control Trial; CCT = Controlled Clinical Trial MM = Music Medicine; MT = Music Therapy; NR = Not Reported, HD = hemodialysis

Significant Findings

Outcome Variable	Author (year)	N	Design	Measure	Results
O ₂ saturation	Burrai et al. (2014)	114	Pretest/posttest RCT	Not specified	Significantly increased in music group; p = 0.000; Significant at p < 0.05 two-tailed
	Hou et al. (2017)	99	Prospective RCT	Biological Monitoring System	Significantly increased in music group; p = 0.001; Significant at p < 0.001
Pain	Binson et al (2013)	54	Pretest/Posttest Crossover with 1 week washout period	Self-report numeric rating scale	p < 0.001 Significant at 0.01
	Burrai et al. (2014)	114	Pretest/posttest RCT	Visual analog scale for pain	p = 0.000; Significant at p < 0.05 two-tailed
	Koca Kutlu & Erne (2014)	60	Case Controlled	Visual analog scale for pain	Significantly decrease at p < 0.05
Anxiety	Binson et al (2013)	54	Pretest/Posttest Crossover with 1 week washout period	Self-report numeric rating scale	Significantly decreased p < 0.001
	Cantekin & Tan (2013)	99	Prospective RCT; within group comparison	STAI: State STAI: Trait	p < 0.01 p < 0.01
	Pothoulaki et al (2008)	60	Pretest/posttest RCT	STAI: State Time 1 STAI: State Time 2 STAI: Trait	p < 0.021 NS
	Salehi et al. (2016)	83	Crossover Clinical Trial	STAI: State STAI: Trait	p < 0.021 NS
Mood	Burrai et al. (2014)	114	Pretest/posttest RCT	Visual analog scale for mood	Significant improvement; p = 0.000; Significant at p < 0.05 two-tailed
Itching	Burrai et al. (2014)	114	Pretest/posttest RCT	Visual analog scale for itching	Significant improvement; p = 0.000; Significant at p < 0.05 two-tailed
Physiological Stress	Cantekin & Tan (2013)	99	Pretest-posttest control within group comparison	Hemodialysis Stressor Scale	p < 0.01 for experimental group
Psychosocial Stress	Cantekin & Tan (2013)	99	Prospective RCT; within group comparison	Hemodialysis Stressor Scale	p < 0.01 for experimental group
Frequency & Severity of Adverse Reactions	Hou et al. (2017)	99	Prospective RCT	Hemodialysis Stressor Scale	Significant decrease in the frequency & severity of adverse reactions; p < 0.05
Respiration Rate	Hou et al. (2017)	99	Prospective RCT	Biological Monitoring System	Significant decrease; p < 0.05
Salivary Cortisol	Hou et al. (2017)	99	Prospective RCT	Biological Monitoring System	Significant decrease; p < 0.05

Significance Not Achieved

Several studies examined the effects of music medicine and music therapy on physiological measures including systolic blood pressure, diastolic blood pressure; heart rate, finger temperature, nausea, vomiting, and cramps. Although there was a decrease in physiological measures, these changes were not significant

Key Findings

1. This systematic review is based on a small number of studies (n = 10).
2. Music listening during dialysis was reported to have a significant positive effect on
 - a. O₂ saturation (2 studies)
 - b. Pain (3 studies)
 - c. Anxiety (4 studies)
 - d. Mood (1 study)
 - e. Itching (1 study)
 - f. Physiological Stress (2 studies)
 - g. Psychological Stress (2 studies)
 - h. Respiration Rate (1 study)
 - i. Salivary Cortisol (1 Study)
3. Most studies were rated as having a high to moderate level of bias based on the CLEAR-NPT adapted for music medicine/music therapy studies
4. The one study that compared music medicine to music therapy showed significant reductions in self-reported anxiety in pain in both conditions
5. Music listening varied in terms of frequency, duration, and type of music

Recommendations

1. More well-controlled clinical trials are needed to determine the efficacy of music medicine and music therapy on physiological and psychological outcome measures.
2. Future studies should compare the following on physiological and psychological outcomes
 - a. Frequency & duration of music medicine and music therapy.
 - b. Live music vs. pre-recorded music.
 - c. Music therapy vs. music medicine

References

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