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CLINICAL STUDY

The Influence of Music Therapy on Perceived Stressors and Anxiety Levels of Hemodialysis Patients

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Abstract

Background: This study was designed as a pretest–posttest control group experiment. The aim was to identify the influence of music therapy on the perceived stressors and anxiety levels of hemodialysis (HD) patients. *Methods*: The data were collected in HD Units of Ataturk University Yakutiye Research Hospital and Regional Education, Application and Research Hospital between February and March. The study population consisted of 104 patients who received dialysis. Since four patients refused to participate, the study was completed with 100 patients. While one-half of the patients formed a control group, the other half consisted of an experimental group. Patient introduction form, Hemodialysis Stressor Scale, and State–Trait Anxiety Inventory (STAI) forms were used to collect the data. HSS was used to identify the stressors perceived by the patients, and STAI form was used to classify anxiety levels. Data were analyzed by using *t*-test and chi-square test. *Results*: It was found that differences between average pretest and posttest scores of perceived psychosocial, physiological, and total stressors were statistically significant. It was also found that differences between average pretherapy and posttherapy test scores of state and trait anxiety were statistically significant. *Conclusions*: Music therapy was influential in reducing anxiety levels and perceived stressors of HD patients. It is concluded that music therapy—as an independent nursing initiative—can be used to help in fulfilling the physical, emotional, and psychological requirements of patients.

Keywords: perceived stressors, anxiety, nursing, music therapy

INTRODUCTION

Kidney failure is an important health problem, both in the world and in Turkey. According to the 2010 data of the Turkish Nephrology Association, there are approximately 62,903 patients with kidney failure, and 49,505 of those have been receiving hemodialysis (HD).[1]

HD is a treatment method, which has been recently used for people with kidney failure. In a typical HD application, the blood is removed from the waste products via artificial kidney.[2]

HD creates stress and anxiety for the patients.[3] Many HD patients, who have confronted with physical and psychological stressors, display psychological problems such as depression and anxiety.[4] Recently, dim environment, massage, and music treatment have been used to reduce stress.[5]

A patient's stress can be reduced, and his/her comfort can be increased by a carefully selected music. In this way, the patient's attention can be diverted from the pain.[6] There are some psychological effects of musical treatment on HD patients. These effects are enhancement of psychological well-being of the patients; removal of depression, fear, and worry; and reduction of anxiety. Physiological effects of music treatment include creating behavioral change and changing the mood. Behavioral change is produced by reducing psychophysiological stress, pain, anxiety, and isolation. Music has a high capability to create relaxation.[6]

Alternative therapy methods such as progressive relaxation, deep breathing exercise, therapeutic touch, and music treatment have been used as independent nursing initiatives to help fulfill the physical, emotional, and psychological requirements of the patients. However, there is a very limited amount of research in which music is used as a nursing initiative, and which investigates the effects of music on the physical and psychosocial symptoms of HD patients.

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In this respect, this study was conducted to (1) identify the effects of music on the physical and psychosocial symptoms of kidney patients receiving HD, (2) use a nonpharmacological method—music—with pharmacological methods, (3) include music in nursing care, and (4) provide data for future research related to this area.

MATERIALS AND METHODS

The present research was conducted as a pretest and posttest control group experiment. The study was done between February and March 2011. The sample consisted of patients who were receiving HD treatment and met the study criteria in HD Units of Ataturk University Yakutiye Research Hospital and Regional Education, Application and Research Hospital.

The study started with 104 patients. Since four of these patients did not accept to participate, the study was completed with 100 patients. Half of the patients formed a control group. The other half formed an experimental group. Randomization was achieved by assigning Monday, Wednesday and Friday HD patients to the experimental group and Tuesday, Thursday and Saturday patients to the control group.

Study Inclusion Criteria

They include the following:

- Patients should have been receiving HD for at least 6 months.
- Patients should receive HD 3 times a week.
- Patients should be over 18 years of age.
- Patients should not have any vision and hearing problems
- Patients should volunteer to participate in the study.

Data Collection Tools

To collect data, a patient introduction form, which identifies patients' individual characteristics (age, gender, marital status, economic level, place of residence, dialysis duration), Hemodialysis Stressor Scale (HSS), and State–Trait Anxiety Inventory (STAI Form TX) were used.

Hemodialysis Stressor Scale (HSS)

The HSS was originally developed by Baldree et al.[7] It was adapted to Turkish society by Kara.[8] HSS identifies treatment-related physiological and psychosocial stressors perceived by HD patients. Six items are classified as physiological (2, 3, 7, 10, 11, 20) and 23 items (1, 4, 5, 6, 8, 9, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29) are classified as psychosocial stressors in HSS. Scale is a 5-Likert-type scale (always: 5, mostly: 4, sometimes: 3, rarely: 2, never: 1). The total HD stressor score is obtained by adding up all items' scores. Physiological Hemodialysis Stressor (FSH) subscale score is obtained by adding up its own items. Psychosocial Hemodialysis Stressor (PSH) subscale score is obtained by adding up its own items. Physiological Hemodialysis Stressor subscale score changes between 6 and 30, and Psychosocial Hemodialysis Stressor subscale score varies between 23 and 115. The total HSS score changes between 29 and 145. The higher the scores, the higher the perceived stress levels are. Low scores indicate that perceived stressors are few. In contrast, high scores represent high numbers of perceived stressors. In the Turkish validity and reliability study of HSS, Cronbach's alpha was 0.77. It is 0.78 for this study.

State–Trait Anxiety Inventory (STAI FORM TX)

State–Trait Anxiety Inventory was developed by Spielberger et al.[9] in 1970. It consists of 40 items. There are two subscales and each scale has 20 items. The scale is a Self-Report Type Inventory. This scale was adapted to Turkish society, and its reliability and validity studies were conducted by Öner and LeCompte.[10]

State Anxiety Scale's possible answers are as follows: (1) Not at all, (2) Some, (3) A lot, and (4) Completely. Trait Anxiety Scale's possible answers are as follows: (1) Almost never, (2) Sometimes, (3) Many times, and (4) Always.

There are two types of statements in the scale. These are (1) direct and (2) reversed items. Direct statements represent negative feelings, and reversed items represent positive feelings. When scoring reversed items, 1 is converted into 4, and 4 is converted into 1. In direct items, 4 represents high anxiety and in reversed items, 1 represents high anxiety and 4 represents low anxiety. "I am anxious" is an example of a direct item, and "I feel calm myself" is an example of a reversed item. If 4 is selected for "I am anxious," 1 is selected for "I feel calm myself"; these answers indicate high anxiety.

There are 10 reversed items in State Anxiety Scale. These are 1st, 2nd, 5th, 8th, 10th, 11th, 15th, 16th, 19th, and 20th items. There are seven reversed items in Trait Anxiety Scale and these are 21st, 26th, 27th, 30th, 33rd, 36th, and 39th items.

Scores obtained from both scales theoretically change between 20 and 80. High score indicates high anxiety and low score indicates low anxiety. Öner and LeCompte[10] identified reliability coefficients of State Anxiety Scale as between 0.83 and 0.87. Reliability coefficients of Trait Anxiety Scale were between 0.94 and 0.96. Cronbach's alpha coefficient of the state anxiety was calculated as 0.84. Trait anxiety was calculated as 0.78 in this study.

Data Collection

Data were collected by researchers in HD units via face-to-face interviews with patients while patients were in bed for their dialysis treatment.

Pretest Data Collection

When collecting pretest data, patients in control and experimental groups were informed, and they received patient introduction form and other scales. Later, two

Turkish art music songs (so-called rast and usak melody) were downloaded to MP3 players. Patients were told that they could listen to these songs whenever they wanted.

Posttest Data Collection

When collecting posttest data, patients in the experimental group received music therapy after pretests 3 times a week during their dialysis treatment. Then, music therapy scales were given to patients.

When collecting posttest data, patients in the control group did not receive any treatment after pretests. A week after the pretest measurements, their perceived stressors and anxiety levels were measured again.

Data Analyses

The data were analyzed with SPSS 15.00 (Statistical Package for the Social Sciences, SPSS Inc., Chicago, IL, USA).

In the data analysis,

- dependent sample *t*–test was used to compare pretest and posttest score differences and
- chi–square test was used to identify homogeneity in patients' individual characteristics.

Limitations and Generalizability of the Study

One limitation of the study was that we studied patients who received dialysis in Ataturk University Yakutiye Research Hospital and Erzurum Region Education, Application and Research Hospital. Therefore, the results can only be generalized to these patients.

Ethics Approval

Patients who agreed to participate were included in this study. The assurance that personal information of the patients would not be disclosed to anybody was promised and "confidentiality principle" was ensured. Permissions from the Council of Ethics of Health Sciences Institute were obtained.

RESULTS

When gender, age, marital status, education, place of residence, economic level, dialysis duration, and pretest scores of patients in experimental and control groups were compared, no statistical differences were found between groups ($p > 0.05$). Two groups were also demographically similar (Table 1). Homogeneity pretest scores were shown in Tables 2 and 3.

Patients in the experimental group scored 81.8 ± 8.1 on psychosocial subscale of Hemodialysis Stressor Scale before music treatment. This value was 74.4 ± 7.4 after the therapy. The difference was statistically significant ($p < 0.01$). Patients in the control group scored 81.1 ± 11.3 on psychosocial subscale of Hemodialysis Stressor Scale in the pretest measurement. This value was 82.3 ± 10.4 in the posttest. The difference was not statistically significant ($p > 0.05$). Patients in the experimental group scored 23.7 ± 3.5 on Physiological Stressor subscale of Hemodialysis Stressor Scale in the pretest measurement. This value was 20.0 ± 2.1 after the therapy. The difference was statistically significant ($p < 0.001$). Patients in the control group scored 23.1 ± 3.1 on Psychosocial

Table 1. Comparison of individual characteristics of experimental and control groups.

	Experiment ($n = 50$)		Control ($n = 50$)		
Variables	Number	%	Number	%	p and X^2
Age					
19–32	4	8	3	6	$p = 0.86$
33–40	12	24	18	36	$X^2 = 0.57$
40 and above	34	68	29	58	
Gender					
Female	24	48	23	46	$p = 0.18$
Male	26	52	27	54	$X^2 = 3.30$
Marital status					
Married	40	80	38	76	$p = 0.35$
Single	10	20	12	24	$X^2 = 1.76$
Education					
Literate	12	24	10	20	$p = 0.18$
Primary school	26	52	26	52	$X^2 = 2.32$
High school and above	12	24	14	28	
Economical status					
Input and expenses are equal	30	60	34	68	$p = 0.54$
Input is less than expenses	20	40	16	32	$X^2 = 0.37$
Place of residence					
City	36	72	40	80	$p = 0.41$
Town	14	28	10	20	$X^2 = 1.74$
Dialysis duration					
6–18 months	4	8	7	14	$p = 0.87$
19–31 months	14	28	15	30	$X^2 = 0.56$
32 months and above	32	64	28	56	

Table 2. Between- and within-group comparisons of pretest–posttest perceived stressor scores of experimental and control group patients.

Subscales and total score averages	Pretest $X \pm SD$	Posttest $X \pm SD$	t	p
Psychosocial				
Experimental group	81.8 ± 8.1	74.4 ± 7.4	36.4	0.00
Control group	81.1 ± 11.3	82.3 ± 10.4	0.21	0.09
t	5.34	1.73		
p	0.090	0.000		
Physiological				
Experimental group	23.7 ±3.5	20.0 ± 2.1	9.32	0.00
Control group	23.1 ± 3.1	23.7 ± 2.9	0.00	1.00
t	3.81	−2.12		
p	0.864	0.000		
Total				
Experimental group	105.0 ± 10.6	92.5 ± 8.5	8.11	0.00
Control group	103.3 ±14.1	105.9 ± 13.7	−34.9	0.00
t	5.01	−3.61		
p	0.06	0.00		

Table 3. Between- and within-group comparisons of pretest–posttest anxiety scores of experimental and control group patients.

	Pretest $X \pm SD$	Posttest $X \pm SD$	t	p
State				
Experimental group	54.6 ± 6.6	50.2 ± 6.1	22.4	0.00
Control group	53.2 ± 3.7	52.4 ± 3.7	0.26	0.80
t	6.8	5.7		
p	0.058	0.000		
Trait				
Experimental group	50.1 ± 9.0	35.7 ± 2.9	10.25	0.00
Control group	51.2 ± 3.7	50.4 ± 3.7	2.21	0.03
t	3.44	−14.22		
p	0.93	0.00		

Stressor subscale of Hemodialysis Stressor Scale in the pretest measurement. This value was 23.7 ± 2.9 in the posttest. The difference, however, was not statistically significant ($p > 0.05$). Patients in the experimental group scored 105.0 ± 10.6 as total pretest scores. This value was 92.5 ± 8.5 after the therapy. The difference was statistically significant ($p < 0.01$). Patients in the control group scored 103.3 ±14.1 as total pretest scores. This value was 105.9 ± 13.7 in the posttest. The difference was statistically significant ($p < 0.001$) (Table 2).

Table 3 shows the between-group and within-group comparisons of pretest and posttest anxiety scores of experimental and control group patients. These comparisons indicated that patients in the experimental group scored 54.6 ± 6.6 for state anxiety in the pretest measurement and scored 50.2 ± 6.1 for state anxiety in the posttest. The difference was statistically significant ($p < 0.01$). Patients in the control group scored 53.2 ± 3.7 for state anxiety in the pretest measurement and scored 52.4 ± 3.7 for state anxiety in the posttest. The difference was not statistically significant ($p > 0.05$). Patients in the experimental group scored 50.1 ± 9.0 for trait anxiety in the pretest measurement and scored 35.7 ± 2.9 for trait anxiety in the posttest. The difference was statistically significant ($p < 0.01$). Patients in the control group scored 51.2 ± 3.7 for trait anxiety in the pretest measurement and scored 50.4 ± 3.7 for trait anxiety in the posttest. The difference was statistically significant ($p < 0.05$).

DISCUSSION

It was found that experimental group patients' perceived psychosocial stressor scores decreased after music therapy and the difference was statistically significant. In contrast, no statistical difference was observed in the control group. The decline in scores indicates that patients' perceived stressors diminished. Another finding was that experimental group patients' perceived physiological stressor scores decreased after music therapy and the difference was statistically significant. However, no statistical difference was observed in the control group. Experimental group patients' perceived total stressor scores also decreased after music therapy and the difference was statistically significant. Control group patients' posttest stressor scores increased and this increment was also statistically significant.

The results of this study are consistent with previous research. Other related research reported positive effects

of music therapy on patients' perceived psychosocial and physiological stress.[4,11–14]

It was found that experimental group patients' state anxiety scores decreased after music therapy and the difference was statistically significant. However, control group patients' pretest–posttest state anxiety scores were similar and the difference was not statistically significant.

Previous studies also reported a decline in anxiety levels of patients after music therapy and the present results are consistent with these studies.[11–14]

CONCLUSIONS

- Experimental group patients' trait anxiety scores decreased after music therapy and the difference was statistically significant. Control group patients' posttest trait anxiety scores also decreased and the difference was statistically significant.
- The decrement in the control group implies that receiving HD for a long time in these patients improves their adaptation ability to trait anxiety.
- Complementary treatment methods such as music therapy should be included in nursing applications for HD patients. Music treatment should also be used more frequently.
- Music therapy should be included in nursing education schedule.
- Similar studies with a longer duration and larger sample sizes should be conducted and their results should be compared to current findings.

***Declaration of interest*:** The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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