

Effect of music on preoperative anxiety in men undergoing urogenital surgery

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KEY WORDS

Preoperative anxiety, music therapy, urogenital surgery, nursing

ABSTRACT

Objective

The purpose of the current study was to investigate the effect of music therapy on preoperative anxiety levels in Turkish men undergoing urogenital surgery.

Design

The study employed a quasi-experimental design. Patients were selected using randomized controlled sampling.

Setting

The study was conducted in a urology clinic in Aziziye Research Hospital, Süleyman Demirel Medical Centre, Atatürk University, Erzurum, a city in the east of Turkey.

Subjects

The study was conducted with a total of 64 patients; 32 in the experimental group; 32 in the control group; aged between 18 and 65; and able to speak, read and write Turkish.

Intervention

The control group received routine preoperative care while the experimental group listened to their choice of music for 30 minutes in their room while they awaited surgery.

Main outcome measures

Pre and post test anxiety was measured using the State Trait Anxiety Inventory (STAI) to assess anxiety before and after listening to the music preferred by the patient.

Results

Anxiety score averages between the groups following the music therapy were statistically significant ($p < 0.001$); 33.68 (SD=8.03) for the experimental group and 44.43 (SD=10.42) for the control group.

Conclusions

These findings support the use of music as an independent nursing intervention to manage preoperative anxiety in patients undergoing urogenital surgery. Listening to self-selected music during the preoperative period can effectively reduce anxiety levels and should be a useful tool for preoperative nursing.

INTRODUCTION

Anxiety is a common phenomenon among hospitalised patients (Wong et al 2001) and is an emotional state characterised by feelings of tension, nervousness, worry, apprehension and with heightened activity of the autonomic nervous system. Anxiety has both psychological and physical effects. The psycho-physiological stress response involves activation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system and is characterised by increased heart rate, blood pressure and cardiac output (Bally et al 2003).

Anxiety is expected in preoperative patients; the incidence of preoperative anxiety is reported to range from 11% to 80% among adult patients (Caumo et al 2001). Preoperative patients awaiting elective surgery, such as urogenital surgery, report worrying about prostate cancer and deterioration in sexual performance (Leinon and Leino-Kilpi 1999). Preoperative anxiety correlates with a high incidence of post operative pain; an increase in analgesic and anaesthetic requirements; and delayed recovery and discharge from hospital. In addition, anxiety may influence adversely the induction of anaesthesia and its recovery and decrease patients' satisfaction with their peri-operative experience (Agarwal et al 2005). Thus, creative and supportive interventions by nurses during these uncertain and uncomfortable waiting times may be important in ameliorating distress and improving health outcomes (Cooke et al 2005).

Hyde et al (1998) investigated how patients preferred to spend the waiting time before an operation and reported that 57.1% would like to listen to music while waiting for surgery; that music influenced a person's emotional feelings and physiologic responses. Music can be used therapeutically for music centered relaxation as a perceptual focus and stimulus, exerting its effect through entrainment or synchronization of body rhythms. The entrainment of body rhythms with music is thought to decrease sympathetic nervous system activity. These responses in turn, lead to decreased adrenergic activity, altered states of consciousness, and decreased neuromuscular arousal; all manifested as physiological indicators of

the relaxation response by decreases in heart rate, respiratory rate, metabolic rate, oxygen consumption, skeletal muscle tension, epinephrine level, gastric acidity and motility, and sweat gland activity, with decreased blood pressure (Chlan 1998). The auditory stimulation of listening to music influences the limbic system of the brain, the centre of emotions, feelings and sensations, by reducing neurotransmitter ability to relay uncomfortable feelings. This triggers the release of endorphins, the body's natural mood-altering substances (Lee et al 2005).

Recently, music has been shown to be effective in alleviating preoperative anxiety (Cooke et al 2005; Wang et al 2002; Yung et al. 2002). Wang et al (2002) conducted a study on music and preoperative anxiety where adult patients undergoing anaesthesia and surgery were randomly assigned to two study groups. The post intervention anxiety level of patients in the music group decreased by 16% compared with the preintervention level, whereas the anxiety level of the control group did not change significantly. Yung et al (2002) studied the effect of music on preoperative anxiety in Chinese men undergoing transurethral resection of the prostate. The study was designed as quasi-experimental with three groups: music intervention, nurse presence and control group. A reduction in anxiety level was found for the music intervention group. Cook et al (2005) in a randomised control trial studied the effect of music on preoperative anxiety in day surgery. The reduction of the anxiety level of the music intervention group was statistically significant.

Research in different patient groups show that music therapy reduced psychological stress as evidenced by decreasing the physiological symptoms of anxiety like heart rate (Lee et al 2005; Chlan 1998), blood pressure (Lee et al 2005; Yung et al. 2002; White 1999) and plasma cortisol hormone levels (Leardi et al 2007) as well as reducing anxiety for preoperative patients (Cooke et al 2005; Wang et al 2002; Yung et al 2002).

Chlan (1998) studied the effectiveness of a music therapy intervention on relaxation and anxiety for patients receiving ventilator assistance. The study

used a two-group, pre and post - test experimental design. State anxiety (pre and post test), heart rate, and respiratory rate were obtained every 5 minutes for 30 minutes. Patients who received music therapy (n=27) reported significantly less anxiety post test than those patients in the control group (n=27). Heart rate and respiratory rate decreased over time for those patients in the music group as compared with the control group subjects. Yung et al (2002) conducted a quasi-experimental design with three groups, using men undergoing transurethral resection of the prostate finding that music intervention significantly reduced patients' blood pressure levels. Lee et al (2005) studied the effect of music on the physiological responses of patients receiving mechanical ventilation. A total of 64 subjects were randomly assigned to undergo either 30 minutes of music intervention or a rest period. There were statistically significant decreases in outcome measures for the music group in the post test period in respiratory rate, heart rate, systolic blood pressure and diastolic blood pressure. For the control group, there was no significant reduction in outcome measures in the post test period.

Leardi et al (2007) conducted a randomised control trial to examine the effect of music therapy on stress response in patients undergoing day surgery. Sixty patients were randomised to one of three groups. Before and during surgery, patients in group 1 listened to new age music and those in group 2 listened to a choice of music from one of four styles. Patients in the control group heard the normal sounds of the operating theatre. Plasma levels of cortisol were evaluated before, during and after the operation. Plasma cortisol levels decreased during surgery in both patient groups who listened to music, but increased in the control group.

Sedative music, which tends to have no accented beats, no percussive characteristics, a slow tempo and a smooth melody, is reported to be suitable for music intervention (Chlan 2000). Research focusing on the type of music used to reduce anxiety has also been conducted (Lee et al 2005; Wong et al 2001). Wong et al (2001) conducted a pretest/

post test crossover with experimental repeated measures designed to examine the effect of music therapy on anxiety in ventilator-dependent patients. The experimental group selected music from the researcher's collection of relaxing music, including both Chinese music (Chinese folk song, music played by Chinese instruments, Chinese music played by Western instruments, Buddhist music) and Western music (Western classic, Western movie music and piano music). Findings indicated that music therapy was effective in decreasing state anxiety. In Lee et al's (2005) randomised controlled study, the patients listened to Chinese classical music, religious music (Buddhist and Christian), Western classical music and music of relaxing natural sounds that had a slow beat. The study demonstrated that music could significantly reduce the physiological responses to anxiety, ie heart rate, respiratory rate and blood pressure, in mechanically ventilated patients.

The musical preferences of patients are an important factor in the effect of music on patients, as not all people are likely to prefer the same types of music because of differences in age and culture for example (Lee et al 2004). Some research reported that the music chosen by patients is important in music therapy (Hayes et al 2003; Hamel 2001). Hamel (2001) found that two patients withdrew from the study because they disliked the music played and recommended that patients should be allowed to select the type of music listened to and suggested that patients be asked to bring their own music to hospital. Hayes et al (2003) evaluated music enjoyment in their study and found that patients who listened to music felt strongly about having a choice.

There are several studies examining the effect of music on vital signs (Uçan et al 2006; Güngör 1999), quality of life (Bozcuk et al 2006), anxiety (Bal 2002, Yılmaz et al 2003; Yıldırım and Gürkan 2007) and pain (Bal 2002) in Turkish patients. In Güngör's (1999) 4-group (music group, touch group, music and touch group and control group) experimental study, the effect of music and touch on vital signs (pulse, blood pressure and breathing) was examined. The study found that both music and touch reduced vital

signs in the three experimental groups compared with the control group. Similarly, Yıldırım and Gürkan (2007) found music reduced anxiety levels in patients undergoing chemotherapy. Bal (2002) found that listening to music during extracorporeal shock wave lithotripsy (ESWL) decreased pain and anxiety levels and suggested the type of music should be determined by the patient. In contrast Bozcuk et al (2006) reported that music had no significant effect on quality of life. Uçan et al (2006) also reported that music did not have any significant effect on pulse rate, blood pressure or oxygen saturation in preoperative endoscopy patients.

One reason why music is an attractive medium for a therapeutic nursing intervention is that it is not harmful and is easy to engage in. Providing music to patients is an inexpensive intervention, as it does not require the use of additional human or other resources, such as training or specialised equipment (Lee et al 2005). Therefore, music therapy can be used as a nursing intervention in preoperative nursing care.

The aim of this study was to examine the effect of music therapy on preoperative anxiety levels in Turkish men undergoing urogenital surgery. The hypothesis tested in this study was: Patients who listen to music before urogenital surgery will have statistically significant lower levels of preoperative anxiety than patients who receive routine care.

METHODOLOGY

Design and Setting

A randomised controlled trial design with a repeated measures approach was used to determine the effect of selected music on anxiety levels. Patients were randomly assigned to either the experiment or the control group. The patients were recruited from a 60 bed inpatient urology clinic between 20 April 2007 and 25 May 2007. Patients were eligible to participate if they were between the ages of 18 and 65; and could speak, read and write Turkish. They were not eligible to participate if they were deaf, had altered mental status or cognitive impairment either by history or identified during the initial

patient contact. All patients were male. A total of 64 patients fulfilled the inclusion criteria and were assigned to the control or the experimental group (32 in the experimental group, 32 in the control group). Sümbüloğlu and Sümbüloğlu (1997) considered that at least 30 subjects for each group are sufficient for experimental studies and parametric tests. Random assignment was achieved based on the day that patients underwent surgery. At the hospital where the research was conducted, the elective urogenital operations were performed four times a week. Patients who underwent surgery on Monday or Wednesday were assigned to the control group while patients who had their surgery on Tuesday or Thursday were assigned to the experimental group. Patient rooms were separated into experimental and control groups and as a result had no contact with each other during the period of music intervention which did not produce any ordered effect.

Sample size was determined by power analysis. Alpha level was taken as 0.05 and reliability was 95% during the calculation of power analysis. The size of the sample after power analysis was determined as 32 patients in each group (Lenth 2006).

Data Collection Questionnaire

The data collection questionnaire had two sections: demographic data form and the State Trait Anxiety Inventory (STAI).

Demographic Data Form

The demographic data form included marital status, education, reason for surgery and age.

State Trait Anxiety Inventory (STAI)

STAI was developed in 1970 by Spielberger and colleagues. The reliability and validity of the Turkish version of the STAI was conducted in 1985 by Öner and LeCompte. Cronbach's alpha internal consistency level was found to be 0.94. State anxiety scale measures how a person feels in a certain situation at a certain period of time. The STAI consists of 20 statements and subjects are asked to indicate how they felt 'at the moment' using a Likert 4-point scale ranging from 'not at all' to 'very much so'. Total scores obtained from the STAI range from 20 to 80.

The anxiety level is evaluated from the total score obtained from the STAI. A score between 1 and 20 is deemed to be not anxious; 21 to 40 as mild anxiety, 41 to 60 as moderate anxiety, and 61 and higher as severe anxiety (Öner and Le Compte 1985). In this study, the internal consistency of the STAI was calculated giving a Cronbach's alpha of 0.92 pretest and 0.94 post test.

Data Collection

All patients fulfilling the inclusion criteria were randomly assigned to one of the two groups: experimental or control.

Experimental group

On the day of surgery and prior to the patients being transferred to the operating theatre, demographic data was collected and STAI was applied to the patients in their beds. The patients then listened to music through earphones via a portable cassette-player for 30 minutes. The music was not heard by any other patient. Since the patients were listening to music through earphones, external noises were diminished. The researcher stayed with the patients during the whole intervention period for data collection. The patients selected the music from the researcher's collection which consisted of a variety of different types of music including Turkish classical music, folk music, Turkish art music, and pop music. The earphones helped the patients to focus on the music. The music volume was adjusted to a satisfactory level based on the subjects' facial expressions and verbal feedback; they smiled and looked calm when satisfied with the volume or expressed their dissatisfaction with the volume verbally if it was too loud or too soft. After the patients had listened to music, STAI was then applied a second time.

Control group

Like the patients in the experimental group, on the day of surgery and prior to the patients being transferred to the operating theatre, demographic data was collected from the patients in the control group and STAI (pretest) was applied. After a 30 minute resting period, STAI (post test) was then re-applied.

While collecting data from both groups, external noise was reduced by closing the door of the patients' room. At any time there were only other patients (5 at most) in the room. The questions were read aloud to each patient, who gave a verbal response. It took approximately 20 minutes to undertake the two measurements of anxiety level for each patient.

Ethics

The Head of the Urology Department at Süleyman Demirel Medical Centre gave written permission for the study to be conducted in the urology department. Formal ethics approval is not required in Turkey when conducting human subject research that does not require invasive procedures and does not pose a threat to human life. Verbal informed consent was obtained from all study patients and all patients were informed they could withdraw from the study at any time. Following the completion of data collection, patients in the control group listened to music for 30 minutes with earphones via a portable cassette-player, selecting the music they would like to listen to from the researcher's collection. The patients in the control group knew the patients in the other group listened to music, but they did not know when they listened to it. Patients were not told whether they were part of the experimental group or the control group to avoid bias.

Data analysis

SPSS version 10.0 was used to analyse the data. Demographic characteristics of individuals in each group were compared using chi-square, and independent-samples t test was used to compare the experimental and control groups. Paired t test was conducted to test for any significant difference between pre and post test STAI scores for each group. The statistical significance level was 0.05 for this study.

FINDINGS

There were no statistically significant differences between two groups in relation to their demographic characteristics (table 1).

Table 1: Demographic characteristics of the sample

Variable	Experimental n (%)	Control n (%)	p value
Marital Status			
Married	27 (84.4)	30 (93.8)	0.426
Single	5 (15.6)	2 (6.2)	
Education			
Illiterate	4 (12.5)	11 (34.4)	0.088
Primary School	9 (28.1)	10 (31.3)	
High School	10 (31.3)	8 (25.0)	
University	9 (28.1)	3 (9.4)	
Reason for surgery			
Urinary tract	22 (31.3)	26 (81.2)	0.194
Genital tract	10 (68.8)	6 (18.8)	
Age	X±SS=40.90 ± 13.34	X±SS=45.68 ± 13.14	0.154

The comparison of the average anxiety score of the groups, pre and post test are shown in table 2. The difference between the pre test average anxiety score of the experimental group before the music therapy and the average anxiety score of control group before the resting period was not demonstrated to be statistically significant ($p=0.243$). The difference between the post test average anxiety score of the experimental group after the music therapy and the post test average anxiety score of control group after the resting period was demonstrated as statistically significant ($p<0.001$). The power of this study was 0.90 for the study population. The effect size of the music therapy intervention was 0.8 which demonstrates that this intervention was effective.

Table 2: The comparison of the average anxiety scores pretest and post test between the groups

Measures	Groups	n	Mean	SD	P value
Pretest	Experimental	32	39.59	7.84	0.243
	Control	32	42.25	10.05	
Post test	Experimental	32	33.68	8.03	0.000
	Control	32	44.43	10.42	

The comparison of the average anxiety scores pre and post test (music therapy) for the experimental group and pre and post test (resting period) for the control group is shown in table 3. After the music therapy, the decrease in the average anxiety score of the experimental group was statistically significant

($p=0.000$). However in the control group, the increase in the post test anxiety score average was statistically significant ($p=0.003$).

Table 3: The comparison of the average anxiety scores pre and post test within the groups

Groups	Experimental (n=32)		Control (n=32)		
	Mean	SD	Mean	SD	
Before therapy	39.59	7.840	Pretest	42.25	10.05
After therapy	33.68	8.033	Post test	44.43	10.42
		P= 0.000			p= 0.003

DISCUSSION

The salient finding of the study was that listening to music used as a nursing intervention preoperatively reduced the anxiety levels of patients undergoing urogenital surgery. Music, chosen by the patients, was delivered continuously for thirty minutes via a cassette-player. The findings suggest music may be a simple, cost-effective tool to help patients manage anxiety before surgery.

In this study, when comparing the anxiety scores of patients in the experimental group after music therapy with the anxiety scores of patients in the control group after the resting period, the anxiety score was lower in the experimental group.

Yung et al's (2002) study investigating the effect of music on preoperative anxiety in the patients undergoing prostate surgery had similar findings. Yılmaz et al (2003) conducted a study to evaluate the effect of music on sedation in extracorporeal shock wave lithotripsy (ESWL) treatment comparing its anxiolytic effects with those of midazolam. The STAI-TA was found to be statistically significantly lower in the music group than the midazolam group which indicates that with the anxiolytic effects of music, ESWL can be performed effectively using music for sedation rather than midazolam (Yılmaz et al 2003).

In McCaffrey and Good's (2000) phenomenological study with nine patients in the post operative recovery period, patients exhibited relaxation while listening to music. Many of the nurses indicated they enjoyed

taking care of the less anxious patients. Cooke et al (2005) conducted a randomised controlled trial to examine the effect of music on preoperative anxiety in adult surgical patients undergoing day surgery such as orthopaedic surgery, cystoscopy and biopsy. The preoperative STAI score mean difference between intervention and control patients was statistically significant.

Wang et al (2002) and Lee et al (2004) both demonstrated that music decreased preoperative anxiety in patients having outpatient and day surgery. Lee et al (2004) investigated the effect of music on preprocedure anxiety levels of patients undergoing day surgery procedures. Day surgery procedures included urology, endoscopy, and cauterisation under local or regional anaesthesia. They used a pre and post test quasi-experimental design applying the STAI-State (Chinese version) to measure anxiety. Patients, after non-random assignment, either listened to their choice of music for 20-40 minutes (n = 58) or received routine care in waiting rooms for 20-40 minutes (n = 55). Anxiety levels in the music group were statistically significantly lower at post test than in the control group. Sendelbach and Halm's (2006) experimental study investigating the physiologic and psychological effect of music on the patients undergoing cardiac surgery found a decrease in the anxiety levels of the music group. In Twiss et al's (2006) study investigating the effect of music on older patients undergoing cardiovascular surgery, the anxiety level of the music group was lower than the control group.

Although the studies cited were conducted with different surgical patient groups, the findings from this study support previous findings that music in the immediate preoperative period reduces anxiety. Therefore it can be concluded that preoperative music intervention might be effective in increasing preoperative comfort.

In this study, when comparing the average anxiety scores before and after music therapy in the experimental group, the decrease in anxiety score average was statistically significant. And in the control group, when comparing the average anxiety scores

before and after the resting period, the increase in the anxiety score average was statistically significant. Yung et al's (2002) study also demonstrated a statistically significant decrease in the anxiety score average of the intervention group while in the control group the anxiety score was high after the resting period although it was not statistically significant. In Bal's (2002) study investigating the effect of music on the pain and anxiety of patients undergoing extracorporeal shock wave lithotripsy (ESWL), the decrease in the anxiety score of the patients in the experimental group after the music therapy was statistically significant, when their anxiety scores before and after the music therapy were compared. In the same study, when the anxiety scores of the control group before and after the resting period were compared, the anxiety score after the resting period was high although it was not significant.

There were also some study findings that differed with the findings of this study (Lepage 2001; Miluk-Kolasa 1996). Miluk-Kolasa (1996) evaluated the physiological effect of music played to 100 patients undergoing surgery measuring vital signs, cardiac output and skin temperature. Patients were randomly assigned to two groups. Anxiety in both groups increased once they received information about their surgery although there was no significant difference in physiological measures. Lepage (2001) randomly assigned patients to two groups in a preoperative waiting area and using a self-rated questionnaire found no difference in anxiety levels in either group although the experimental group required less midazolam to achieve a similar level of relaxation to the control group.

STUDY LIMITATIONS

There are certain limitations to this study. The sample was small, all male and limited to those patients who agreed to participate and it reflects only one geographical area of Turkey. The method of data collection could also be regarded as another limitation. Therefore the results of this study cannot be generalised to all male patients undergoing urogenital surgery or to all Turkish patients. Despite

the small sample size, significant differences in anxiety scale score averages were detected.

CONCLUSION

The results of this study show that listening to preferred music can effectively reduce preoperative anxiety. Despite the positive results, the current study needs to be replicated using a larger sample. The researches might examine the effectiveness of listening to preferred music for other patient populations.

IMPLICATIONS FOR NURSING PRACTICE

This research demonstrates that music should become a routine component of the care provide to patients during the preoperative period. The aim should be to minimise anxiety associated with surgery. Music can be used as an independent nursing intervention for anxiety reduction. A number of specific clinical situations are worthy of note. Music should be offered to surgical patients during their pre and post operative care. Nurses in the urology clinic should encourage patients to listen to their choice of music preoperatively by providing portable compact disc players and informing patients to bring a music compact disc with them. This research is important in providing information about evidence-based interventions for peri-operative nurses.

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