

Influence of Music on Preoperative Anxiety and Physiologic Parameters in Women Undergoing Gynecologic Surgery

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Abstract

The aim of this study was to determine the influence of music on anxiety levels and physiologic parameters in women undergoing gynecologic surgery. This study employed a pre- and posttest experimental design with nonrandom assignment. Ninety-seven women undergoing gynecologic surgery were included in the study, where 49 were allocated to the control group (nonmusic group) and 48 were assigned to the experimental group (music group). Preoperative anxiety was measured using the State Trait Anxiety Inventory (STAI) while noninvasive instruments were used in measuring the patients' physiologic parameters (blood pressure [BP], pulse [P], and respiration [R]) at two time periods. Women allocated in the experimental group had lower STAI scores ($t = 17.41, p < .05$), systolic ($t = 6.45, p < .05$) and diastolic ($t = 2.80, p < .006$) BP, and P rate (PR; $t = 7.32, p < .05$) than in the control group. This study provides empirical evidence to support the use of music during the preoperative period in reducing anxiety and unpleasant symptoms in women undergoing gynecologic surgery.

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Keywords

anxiety, gynecologic surgery, music therapy, physiologic parameters, State Trait Anxiety Inventory

Introduction

Patients generally experience high levels of anxiety when hospitalized to undergo surgery and other invasive procedures. Anxiety is an emotional state consisting of a set of behavioral manifestations, which occurs in 11% to 80% of adult surgical clients prior to surgery regardless of the scope and extent of surgery (Caumo et al., 2001; Starkweather, Witek-Janusek, Nockels, Peterson, & Mathews, 2006). Women, in particular, experience high levels of anxiety during surgery when compared with men (Caumo et al., 2001; Mitchell, 2003). Many factors are thought to contribute to surgical patients' anxiety: preoperative waiting time, fear of postoperative pain, disfigurement, disruptions of their personal and professional lives, and even financial burdens (D. Lee, Henderson, & Shum, 2004; Mitchell, 2003; Poleshuck et al., 2006; Shelby, Taylor, Kerner, Coleman, & Blum, 2002). Although considered as a common phenomenon and accepted as a normal response in anticipation of a surgical event, high levels of anxiety affects patients' postoperative outcome and overall well-being (Hook, Songwathana, & Petpichetchian, 2008; McCance & Huether, 2006; Starkweather et al., 2006). Therefore, the challenge for perioperative nurses is to maintain physiological and psychological well-being of patients by reducing anxiety and fear.

Background

Anxiety is defined as a state of uneasiness or apprehension resulting from the anticipation of a real or perceived threatening event or situation. This state commonly occurs among preoperative patients and ranges from low to high in intensity depending on the individual's perception of the event (Arslan, Ozer, & Ozyurt, 2008; Pritchard, 2009). Anxiety related to surgery is thought to be related to fear of the outcome of the surgery, separation from friends and family, fear of death and disfigurement, coping with postoperative pain and treatment regimens, fear of losing independence, and surgical recovery time from surgery burdens (D. Lee et al., 2004; Mitchell, 2003; Poleshuck et al., 2006; Shelby et al., 2002). It usually appears during the planning phase including scheduling of the surgical procedure and peaks during the day of admission. (Carr, Brockbank, Allen, & Strike, 2006; Pritchard, 2009). Women, in particular, experience high levels of anxiety during surgery when

compared with men (Caumo et al., 2001; Mitchell, 2003). Although studies on prevalence of anxiety in women undergoing gynecologic surgery are scarce, Carr et al. (2006) found that rates reach 67%; 45% during the night before surgery, 53% in the morning of surgery, and 67% just prior to administration of anesthetic agents.

Although considered a normal phenomenon and highly anticipated during the preoperative period, anxiety that exceeds an individual's tolerance may have harmful physiological and psychological effects to the human body. During the preoperative period, surgery-related anxiety affects the functioning of the sympathetic nervous system and hypothalamic–pituitary–adrenal axis. This in turn triggers the release of biological substances that cause physiological and psychological manifestations of anxiety (McCance & Huether, 2006; Pritchard, 2009), which can affect surgical outcomes. High levels of anxiety are attributed to poor surgical outcomes. This will additionally affect the immune system by significantly decreasing cellular immunity, which can subsequently prolong the time for healing (McCance & Huether, 2006; Starkweather et al., 2006). It will alter the individual's postoperative pain response by decreasing pain tolerance and threshold, which will lead to prolonged recovery time and hospital discharge (Hook et al., 2008). In response to the various adverse effects of anxiety, it is imperative that interventions for managing anxiety be explored to reduce postoperative complications.

Substantial research had been undertaken to identify anxiety-reduction interventions and strategies such as therapeutic relationships and providing surgical-specific preoperative information and education (Erci, Sezgin, & Kacmaz, 2008; Kain et al., 2007; Ng, Chau, & Leung, 2004; Spaulding, 2003; Stirling, 2006). Other interventions such as application of essential oils, relaxation techniques, and parental presence were also found to be effective in reducing anxiety (Kain et al., 2007; Stirling, 2006). However, it can be noted that most of the strategies and interventions available provide limited evidence for managing preoperative anxiety and stabilizing vital signs among preoperative patients. Given this constraint, evidence-based, nonpharmacological approaches in managing preoperative anxiety during the immediate preoperative period is essential. One innovative approach is the use of music intervention.

Music intervention, which is defined as utilization of music for restoration, maintenance, and improvement of diseases and defects (Kemper & Danhauer, 2005) has been studied and used in a variety of populations and settings primarily to reduce pain and anxiety and induce relaxation (Bringman, Giesecke, Thörne, & Bringman, 2009; Cooke, Chaboyer, Schluter, & Hiratos, 2005; Kemper & Danhauer, 2005; Labrague, Rosales, Rosales, & Fiel, 2013; D. Lee et al., 2004; K. C. Lee, Chao, Yiin, Chiang, & Chao, 2011; K. C. Lee et al., 2012; Ni, Tsai, Lee, Kao, & Chen, 2012; Sendelbach, Halm, Doran, Miller, &

Gaillard, 2006; Twiss, Seaver, & McCaffrey, 2006). The act of listening to music has been proven to be effective in reducing anxiety and pain. Music additionally induces relaxation and plays an important role in the provision of comfort for patients by decreasing activity in the sympathetic nervous system (Arslan et al., 2008; Boso, Politi, Barale, & Emanuele, 2006; Cooke et al., 2005; Gillen, Biley, & Allen, 2008). In a randomized controlled study conducted by Ni et al. (2012) in a group of patients undergoing minor surgery, those patients who were provided with musical interventions reported a significantly lower level of anxiety on the State Trait Anxiety Inventory (STAI) compared with the nonmusical group. Cooke et al. (2005) introduced music into a group of adult surgery patients in Australia. The study's findings supported the hypothesis that listening to music prior to surgery is associated with a decrease in preoperative anxiety. Music also showed a significant reduction in anxiety in the immediate preoperative period when having procedures performed in the daytime hours (D. Lee et al., 2004). Music listening also decreases preoperative anxiety in a preoperative setting to a greater extent when compared with the use of preoperative midazolam (Bringman et al., 2009).

Music can also have positive effects on vital signs of preoperative patients (Buffum et al., 2006; Hamel, 2001; D. Lee et al., 2004; Wang, Kulkarni, Dolev, & Kain, 2002; Wong, Lopez-Nahas, & Molassiotis, 2001; Yung, Chui-Kam, French, & Chan, 2002). In a quasi-experimental study conducted by Hamel (2001) with 101 subjects prior to cardiac catheterization, music significantly reduced physiologic parameters. After listening to music, systolic blood pressure (BP) was lower than baseline measurements and the mean heart rate decreased after 20 min in the music group. Yung et al. (2002) also found significant reduction in systolic and diastolic BP and mean heart rate following music interventions. Similarly, a significant reduction in heart rate and respiratory rate (RR) was also observed by Wong et al. (2001) in their study using crossover repeated measures design with random assignment. However, in other studies conducted, music provided no significant changes in vital signs (Buffum et al., 2006; D. Lee et al., 2004).

For centuries, music has been used as a modality in health care and as an adjunct in treating varied health problems (Bringman et al., 2009; Buffum et al., 2006; Cooke et al., 2005; Hamel, 2001; Kemper & Danhauer, 2005; Labrague et al., 2013; D. Lee et al., 2004; Yung et al., 2002). However, little is known in the literature highlighting the use of music in alleviating anxiety among women who are known to experience high levels of anxiety prior to a surgical procedure. Furthermore, a thorough review of the literature identified that this topic has never been previously researched in the Philippines. For this current study, the researchers are interested in identifying influence of music on the anxiety level and vital signs among women undergoing gynecologic surgery.

Aim of the Study

The aim of this study was to determine the influence of music on anxiety levels and vital signs of women undergoing gynecologic surgery. More specifically, this study aimed

1. to compare the anxiety levels of the control and experimental group after exposure to music and
2. to compare the physiologic parameters (RR, BP, pulse rate [PR]) of the control and experimental group after exposure to music.

Method

Research Design

This study utilized a pre- and posttest experimental design with nonrandom assignment to determine whether music decreases anxiety levels in women undergoing gynecologic surgery and to examine whether it has effects on their physiologic parameters.

Study Subjects

Subjects in this study were recruited from a 150-bed capacity government hospital in Samar Province, Philippines during the months of September to November 2013. This study used a purposive sampling of women who were undergoing gynecologic procedures. To be eligible to participate in the study, subjects were required to (a) have no hearing difficulties, (b) be at least 18 years old, (c) have no presurgical morbidities, (d) be informed and have signed consent form, and (e) be undergoing gynecologic surgery.

In this study, gynecologic surgery refers to surgery that involves the female reproductive system to include minor and major operative procedures. One hundred five subjects were originally recruited to participate in the study. However, eight women withdrew for the following reasons: Four were referred to highly specialized facility, three revealed having hearing difficulties, and one refused to wear the required headset. Finally, 97 women were included in the study. Forty-nine women were allocated to the control group (nonmusic group) and 48 women were assigned in the experimental group (music group). The number of subjects both in the control and experimental group were equivalent to the number of subjects in previous studies conducted (Arslan et al., 2008; Hamel, 2001; D. Lee et al., 2004; K. C. Lee et al., 2012).

Music

Three types of prerecorded music were used in this study consisting of classical, country, and nature sounds with slow and flowing tempos. The music tempo was primarily chosen (with the help of a music expert) to mimic the human heart beat. This would be considered appropriate in reducing anxiety as it has a slow tempo, a middle low pitch, low volume, and has a simple and steady melody. In a systematic review of recent studies describing the clinical effects of music intervention preoperatively, it has been suggested that music used therapeutically should have the following characteristics: (a) slow and flowing music, (b) approximately 60 to 80 beats per minute, (c) is nonlyrical, (d) consists predominantly of low notes, (e) is comprised mostly of strings with minimal brass or percussion, and (f) has a maximum volume level at 60 decibels (dB; Cepeda, Carr, Lau, & Alvarez, 2006; Nilsson, 2008). Preselected music was recorded in four multimedia players (MP3s) with the utilization of accompanying headphones.

Measurement

Anxiety

Preoperative anxiety was measured using the STAI. It is a 20-item report instrument developed by Spielberger (2010) and was designed to evaluate patients' feeling of apprehension, tension, nervousness, and worry. Patients rated their responses on the scale of 1 (*not at all*) to 4 (*very much so*), the intensity of the feelings being asked about. The instrument has been extensively utilized with a high level of reliability and validity. The state anxiety score can range from 20 to 80 with higher scores indicating higher levels of anxiety. The STAI was translated into the individual country's language using the American English version, using a forward and back translation process. The translated version was discussed with a group of experts to determine content validity.

The Cronbach's alpha of the STAI was calculated. The 20-item inventory scale yielded a Cronbach's alpha of .92, which is comparable with previous studies (Arslan et al., 2008; Buffum et al., 2006; Spielberger, 2010).

Physiologic Parameters

Noninvasive instruments were used in measuring patients' vital signs. BP and heart rate were measured with an automatic BP monitor (Japan, OMRON HEM 7111). The RR was obtained by the researchers counting one full

minute the number of times the chest rose and fell. To ensure an accurate measurement of physiologic measures, the researcher underwent intensive training in vital signs monitoring.

Music Intervention Protocol

After seeking an informed, signed consent from the participants, eligible women who agreed to participate were assigned to the control and experimental group. The music intervention took place in the preoperative waiting room. Both groups did not receive anxiety medications during the course of the study. The experimental group received and was exposed to music intervention for 20 min prior to admission to the operating room, whereas the control group only received standard nursing care. In most studies conducted, listening durations ranged from 15 min to 40 min, however, a minimum of 15 to 20 min of listening to music was shown to be effective in minimizing preoperative anxiety (Pittman & Kridli, 2011). Measures of anxiety with the use of the STAI and physiologic parameters (RR, BP, PR) were obtained before and after 20 min of exposure to music in the experimental group and 20 min after taking physiologic parameters (RR, BP, PR) in the control group. To block environmental noise that may heighten anxiety or may distract participants, headphones were used to deliver the music. In most studies conducted, headphones were used to provide music to the subjects (Arslan et al., 2008; Cooke et al., 2005; D. Lee et al., 2004; Nilsson, 2008). Subjects were also given the freedom to adjust and readjust the volume of music during the entire listening experience. In addition, to avoid unnecessary disturbances in the preoperative waiting rooms, subjects were assigned by group either into the control group or experimental group on a weekly basis. For instance, patients who were scheduled for surgery on the first week were assigned in the control group and those who were assigned in the following week were assigned in the experimental group. See Figure 1 for the flow diagram through the phases of the trial.

Statistical Analysis

The data were coded and entered into a computerized database and analyzed using the SPSS (version 19). Descriptive statistics such as the mean, frequency, and standard deviation were used to quantify the participants' demographic profile. To test for the homogeneity and normality of the two groups, chi-square and Fisher's exact test were used. Paired *t* tests were utilized to examine any significant difference between the pre- and posttest STAI, and physiologic parameters for each group. To compare the control and

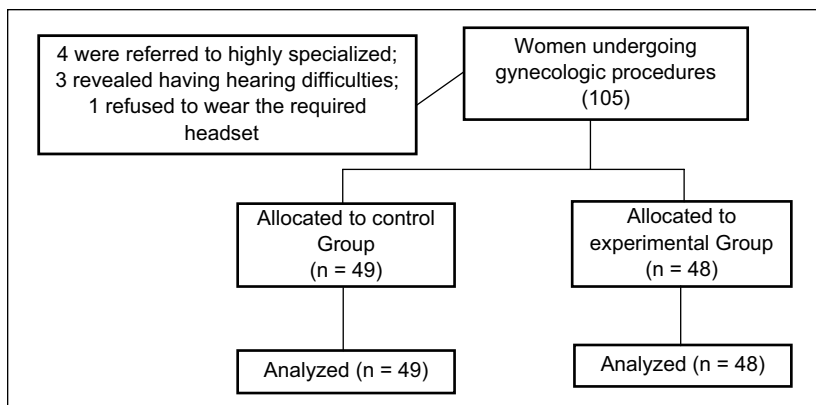


Figure 1. Flow diagram of the trial.

experimental group, the unpaired t test was used. The level of significance was set at $p < .05$.

Ethical Considerations

Approval for the study was granted by the Ethical Committee of Samar State University prior to the actual study. The principal researcher sought the permission of the hospital director and chief nurse of the hospital prior to conduction of the study. Consent forms from the subjects were also secured upon approval to participate in the study.

Results

Ninety-seven women were recruited in this study. Forty-nine women were allocated in the control group, and 48 women were assigned in the music group. The mean age was 42.10 years ($SD = 5.02$) and 42.31 years ($SD = 4.89$) in the control group and experimental group, respectively. When compared, no significant differences were identified between the two groups in their demographic characteristics such as civil status, education, history of previous surgery, and type of surgery. The majority of the subjects chose classical music (53.61%, $n = 52$) whereas the rest chose nature (26.80%, $n = 26$) and country music (19.59%, $n = 19$; Table 1).

Baseline scores of the two groups on the STAI and physiologic measures were compared using inferential statistics. Results of five independent t tests indicate that the two groups were not significantly different on STAI scores

Table 1. Characteristics of the Subjects in Two Groups.

Variable	Control group (<i>n</i> = 49) <i>M</i> (<i>SD</i>)/ <i>n</i> (%)	Experimental group (<i>n</i> = 48) <i>M</i> (<i>SD</i>)/ <i>n</i> (%)	<i>t</i> / χ^2	<i>p</i>
Age				
Mean age (year)	42.10 (5.02)	42.31 (4.89)	0.208	.835
Civil status				
Single	8 (16.32)	5 (10.42)	3.078	.214
Married	38 (77.55)	35 (72.92)		
Separated	3 (6.12)	8 (16.67)		
Education				
Primary	10 (20.41)	8 (16.67)	0.560	.755
Secondary	16 (32.65)	19 (39.58)		
Tertiary	23 (46.94)	21 (43.75)		
History of previous surgery				
No	42 (85.71)	40 (83.33)	0.105	.745
Yes	7 (12.28)	8 (16.67)		
Types of surgery				
Partial Hysterectomy	3 (6.12)	2 (4.17)	1.333	.987
Dilatation and curettage	5 (10.20)	4 (8.33)		
Completion curettage	9 (18.37)	12 (25)		
Tubal ligation	12 (24.49)	10 (20.83)		
Total Hysterectomy	4 (8.16)	3 (6.25)		
Breast mastectomy	5 (10.20)	6 (12.5)		
Breast lumpectomy	6 (12.24)	7 (14.83)		

($t = 1.02$, $p = .3085$), systolic BP ($t = 1.48$, $p = .1407$), diastolic BP ($t = 0.99$, $p = .3202$), PR ($t = 0.61$, $p = .5445$), and RR ($t = 1.33$, $p = .1877$). The result showed that there is normality and homogeneity of samples on both groups.

With the use of the dependent t test (one-tailed test), STAI scores and physiologic measures of both groups were examined separately for any changes at Period 1 and Period 2 (Table 2). Statistically significant decreases in the STAI scores ($t = 11.89$, $p < .05$), systolic BP ($t = 7.99$, $p < .05$), diastolic BP ($t = 4.16$, $p < .05$), and PR ($t = 5.33$, $p < .05$) were observed except for the RR ($t = 0.17$, $p = .8579$) in the experimental group. For the control group, there were no significant changes noted on the systolic BP ($t = -0.37$, $p = .7130$), diastolic BP ($t = 1.28$, $p = .2041$), and RR ($t = 0.25$, $p = .7991$). However, significant increases in the STAI scores ($t = -8.78$, $p < .05$) and PR ($t = -6.01$, $p < .05$) were noted.

Table 2. Means, Standard Deviations, t Values, and p Values After Music Intervention.

Scale/parameter	Experimental group (n = 48)				t value	p value	Control group (n = 49)				t value	p value
	Before	M/SD	After	M/SD			Before	M/SD	After	M/SD		
STAI	40.75 ± 1.97		36.43 ± 1.86		11.89	<.05*	41.18 ± 2.16		43.30 ± 2.02		-8.78	<.05*
Systolic BP	127.60 ± 5.20		123.04 ± 4.25		7.99	<.05*	129.30 ± 6.03		129.48 ± 5.49		-0.37	.7130
Diastolic BP	75.93 ± 5.15		73.81 ± 4.91		4.16	<.05*	77.08 ± 6.13		76.67 ± 5.11		1.28	.2041
Pulse rate	75.39 ± 4.87		71.39 ± 4.28		5.33	<.05*	74.82 ± 4.35		77.51 ± 3.95		-6.01	<.05*
Respiratory rate	18.39 ± 1.51		18.35 ± 1.56		0.17	.8579	18.75 ± 1.14		18.73 ± 1.15		0.25	.7991

Note. STAI = State Trait Anxiety Inventory; BP = blood pressure.

*p < .05.

Table 3. Difference on the Posttest Scores of the Control and Experimental Group After Music Intervention.

Scale/parameter	Experimental (<i>n</i> = 48) <i>M</i> / <i>SD</i>	Control (<i>n</i> = 49) <i>M</i> / <i>SD</i>	95% CI	<i>t</i> value	<i>p</i> value
STAI	36.43 ± 1.86	43.30 ± 2.02	[-7.65, -6.08]	17.41	<.05*
Systolic BP	123.04 ± 4.25	129.48 ± 5.49	[-8.42, -0.83]	6.45	<.05*
Diastolic BP	73.81 ± 4.91	76.67 ± 5.11	[-4.88, -0.83]	2.80	.0060*
Pulse rate	71.39 ± 4.28	77.51 ± 3.95	[-7.78, -4.46]	7.32	<.05*
Respiratory rate	18.35 ± 1.56	18.73 ± 1.15	[-0.93, 0.17]	1.36	.1747

Note. CI = confidence interval; STAI = State Trait Anxiety Inventory; BP = blood pressure.

**p* < .05.

An important finding focused on whether the experimental group had significantly lower STAI scores and physiologic parameters (Table 3). Five independent *t* test analyses were conducted to compare the two groups after ensuring homogeneity of the samples used. Women in the experimental group had lower STAI scores ($t = 17.41, p < .05$) than the control group. No significant difference in the RR ($t = 1.36, p = .17$) was noted in both groups.

Discussion

Patients during the preoperative period may have stress and anxiety heightened due to the unknown environment and unfamiliar staff. During this period, the sympathetic nervous system is aroused resulting in increased body processes leading to undesirable surgical outcomes (Hook et al., 2008; McCance & Huether, 2006; Pritchard, 2009; Starkweather et al., 2006). Developing effective anxiety-reduction interventions based on empirical evidence is essential to optimize nursing care. Music intervention may be particularly effective for patients experiencing physical and psychological distress. With that, this study determined the influence of music on the anxiety level and physiologic parameters in women who will undergo gynecologic surgery.

Key finding of this study indicated that exposure to music intervention during the immediate preoperative period was effective in reducing anxiety levels in women undergoing gynecological surgery. Subjects in the experimental group (allocated to music group), after listening to music, reported significant reduction in their anxiety level compared with those women allocated in the control group. This result further supports previous findings of

the use of music in the reduction of anxiety during the immediate preoperative period. For instance, in a recent systematic review conducted by Bradt, Dileo, and Shim (2013), results indicated that listening to music may help reduce anxiety in patients awaiting surgery. Similarly, Hamel (2001) and El-Hassan, McKeown, and Muller (2009) also concluded that listening to music, regardless of age and type of procedures, may be an effective intervention for decreasing preoperative anxiety. The same result was obtained in randomized controlled studies of previous authors (Arslan et al., 2008; Bringman et al., 2009; Cooke et al., 2005; D. Lee et al., 2004; K. C. Lee et al., 2012; Wang et al., 2002). Preoperative STAI scores in patients undergoing day surgery such as orthopedic, cystoscopy, biopsy, urology, and endoscopy had significantly lower scores with posttest than in the control group. Significant reductions in the anxiety levels were also obtained in the experimental studies conducted by Twiss et al. (2006) and Sendelbach et al. (2006) among a wide range of surgical patients. Interestingly, subjects in the control group reported increased STAI scores and PRs during the posttest. This suggests that as the surgical schedule time approaches, preoperative anxiety increases. With the proven anxiety-reducing effects of music, perioperative nurses may consider this intervention as part of their routine nursing care for surgical patients during the immediate preoperative period as anxiety and stress is heightened in this period (Hamel, 2001).

Findings also revealed significant changes in the physiologic parameters. Women in the experimental group demonstrated a significant reduction in their BPs (systolic and diastolic BPs) and heart rates but not the RR. This is in keeping with the previous studies conducted in a variety of populations and settings. For instance, Hamel (2001) provided music intervention to cardiac patients prior to surgery. After exposure to music, systolic BP and heart rate lowered significantly in the music group. Similarly, Yung et al. (2002) proved that music notably reduced BP and heart rate in patients undergoing transurethral resection of the prostate. In a systematic review conducted by Nilsson (2008) concerning the effects of music intervention on anxiety and pain reduction, it was indicated that music has both physiological (changes in heart rate, BP, and RR) and psychological (reduction in anxiety and pain) benefits. However, Wang et al. (2002) and Buffum et al. (2006) observed no significant changes in the heart rate and respiratory pattern in the music group when compared with nonmusic group.

The majority of the studies conducted utilizing music as an intervention for preoperative anxiety utilized primarily male subjects (Arslan et al., 2008; Buffum et al., 2006; Cooke et al., 2005; Hamel, 2001; Kemper & Danhauer, 2005; D. Lee et al., 2004; K. C. Lee et al., 2011; Yung et al., 2002) who are known to experience comparably lesser anxiety than women (Caumo et al.,

2001; Mitchell, 2003). In the present study where subjects are female, music proved to be beneficial in the reduction of anxiety and vital signs. This result implicates that music intervention may produce significant and beneficial effects on the physiologic parameters and anxiety regardless of gender differences.

Theoretically, during the preoperative period, music acts in several ways to reduce anxiety and cause changes in the physiologic parameters. The act of listening to music distracts patients and diverts feelings of anxiety and fear to a more positive, stress-free experience (Cooke et al., 2005). Soothing music lowers heart rate and BP by reducing catecholamine levels (Gillen et al., 2008; Mok & Wong, 2003). The act of listening to music influences the limbic system of the brain by reducing neurotransmitters' ability to relay uncomfortable feelings and triggers the release of body's natural mood-altering substances called enkephalins and endorphins (Boso et al., 2006; Gillen et al., 2008). Music, aside from anxiolytic effects, may also affect the sympathetic nervous activity and, in turn, decreases in heart rate, RR, and BP (Arslan et al., 2008).

With the above findings, and with the abundance of the results of the value of music during the preoperative period, the present study may add to the existing body of knowledge regarding the use of music in health care and may further support the use of music as an effective intervention option that promotes the physical and psychological well-being of the patient. In light of the current global climate in nursing, it is important that health care providers in general and perioperative nurses in particular are able to support the needs of the patient by creating an environment that maintains relaxation and promotes overall well-being. Although music yielded favorable effects on the anxiety level in women undergoing gynecologic surgery, it should not be utilized as a replacement for medical treatments and regimens. Music interventions may be introduced to patients as an adjunct to produce more desirable anxiolytic effects and be incorporated as part of nursing care. Furthermore, hospital administrators may consider establishing "music centers" in the hospital facility as a way of reducing patients' experiences of discomfort and unpleasant symptoms. With the current constraints on health care budgets, providing soothing music in the preoperative environments in patients who are scheduled for surgery is highly feasible.

While this study is essential, as it is one of the few studies conducted utilizing women as subjects, nevertheless it has some limitations. First, awareness of the subjects regarding the study protocol might have affected their responses. Second, in the present study, prerecorded music was provided to the patient, thus limiting the optimal effect of music on the anxiety levels. It could also be possible that they might have different responses not reflective

of their real feelings or emotions. Previous studies suggested that for the music to be therapeutic in reducing stress and inducing relaxation, it must be the preference of the subject. D. Lee et al. (2004) stressed that beneficial effects of music on anxiety reduction are associated with the music preference of the listener. However, in a recent systematic review conducted, the genre of soothing music appeared not to influence the effectiveness of music interventions (Cepeda et al., 2006; Nilsson, 2008). Third, the use of headsets rather than speakers might have caused different listening experiences that may impact music intervention effects. Fourth, considering that the subjects were taken from a single hospital facility, the researchers cannot make generalization based on the result. Furthermore, this study may be conducted comparing different types of music with varied listening duration time to determine the extent to which music would result in maximum anxiety reduction. Research studies are also needed to determine therapeutic effects of self-selected music versus researcher-selected music in anxiety reduction among surgical patients in varied populations.

Clinical Implications

As a noninvasive intervention, music intervention is safe, low risk with no apparent deleterious effects, cost-effective, and easy to administer. Music may be used as a complementary intervention by health care practitioners in general and perioperative nurses in particular to promote comfort and relaxation as well as to reduce preoperative anxiety among surgical patients.

Conclusion

Perioperative nurses are always challenged to provide holistic care to surgical patients by providing comfort and safety during the entire perioperative experience. Findings of this study provide empirical evidence to support the use of music during the preoperative period in reducing anxiety and stabilizing physiologic parameters in women undergoing gynecologic surgery.

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Authors' Note

Both authors contributed equally in study design, data collection and analysis, manuscript preparation, and literature review.

Declaration of Conflicting Interests

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