Original Article

Korean and American Music Reduces Pain in Korean Women After Gynecologic Surgery

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Abstract

American music has been found to relieve pain in adults in several countries but has not been tested in Korea. Korean women have reported that they would like American music as well as Korean folk songs and religious music sung in Korean. The study purpose was to pilot-test the effects of music on pain after gynecologic surgery in Korean women and to compare pain relief between those who chose American or Korean music. Using a quasiexperimental pretest-posttest design, 73 South Korean women on a preoperative unit were assigned by day of the week to receive music (n = 34; 47%) or no music (n = 39; 53%). The music group chose among Korean (ballads and religious and popular songs) and American (soft slow piano and orchestra) music and heard it for 15 minutes at four time points (postoperatively), whereas the controls rested in bed. They marked VAS Sensation and Distress of Pain scales before and after each test. The two groups were similar on pretest pain. When controlling for pretest pain, MANCOVA indicated that there was significantly less posttest pain in those with music plus analgesics than those with analgesics alone at three of the four tests: p = .04 to .001. Two-thirds in the music group (n = 21; 62%) chose Korean music and one-third (n = 13; 38%) chose American, with no difference in pain: both were effective. In addition to analgesics, music can be used to reduce postoperative pain in Korean women. Patients selected music that was appealing to them. Nurses in many countries can consider music of the country and seek individual preferences to use in addition to analgesics for postoperative pain.

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Women who undergo gynecologic (GYN) surgery have moderate or severe pain, despite patient-controlled analgesia (PCA) (Good, Anderson, Stanton-Hicks, Grass, & Makii, 2002). Surgery and postoperative pain are major physiologic and psychologic stressors that can lead to increased tissue breakdown, coagulation, and fluid retention, with deleterious effects on recovery (Acute Pain Management Guideline Panel, 1992). An earlier study of 311 women aged 18-70 years in the United States has shown that music reduced pain after GYN surgery 24%

more than patient-controlled analgesia alone (Good et al., 2002). Across 11 postoperative studies, a Cochrane Review reported mild relief from music in addition to analgesics (Cepeda, Carr, Lau, & Alvarez, 2006). However, music has cultural implications, and insufficient studies have been conducted in many countries of the world. The purpose of the present study was to determine if the positive effects of music on pain found in postoperative GYN patients in the U.S. were also found in Korean women and to compare the effects of American and Korean music.

BACKGROUND

Music has been shown to reduce the sensation and distress of pain after abdominal surgery in a large (n = 500) randomized clinical trial (Good et al, 1999). Good and her team have tested American music in other cultures and have found it was effective for postoperative and/or labor pain in the U.S., Taiwan, Thailand, and Egypt (Good & Chin, 1998; Good et al., 1999; Phumdoung & Good, 2003; Salem, 2004). Research participants were given a choice among five types of music, and after using it for pain or sleep most reported that they liked the music a moderate amount or a lot. However, this music had not been tested in other countries, such as Korea, or compared to culturally specific music. The study extended work conducted in the U.S. by Good and colleagues on the effects of soft music on pain in culturally diverse patients (Good et al., 2000).

Culturally based differences in music are evident in varying combinations of pitch, rhythm, tempo, melody, harmony, and interval and in the meanings that music brings to people. In the West a seven-pitch scale is used, whereas a five-pitch scale is traditional in Asian countries. Furthermore, the instruments of a Western classical, popular, or jazz ensemble are quite different from the instruments or the sounds heard in Asian, Middle Eastern, African, or Eastern European countries (Krumhansl et al., 2000). Perusal of the internet yields many interesting and colorful examples of Korean string and wind instruments that are not well known in the West. Researchers have found that people have culturally based music expectations of the distribution and sequence of tones (Krumhansl, 2000; Krumhansl et al., 2000). In addition, folk and religious music in other countries hold special meanings for the people who have grown up hearing the sounds and lyrics in their own language (Krumhansl et al., 2000). Buddhist hymns and Christian hymns sung in Korean are meaningful to many people in Korea.

Two Korean investigators reported that music reduced postoperative pain (Hong, 1989; Joung, 1999) but did not report the types of music used. Hong alternately assigned 16 abdominal surgical patients to a control group or a music group. Those in the music group selected their preferred music and listened to it for 6 to 8 hours after surgery. They reported significantly less pain, less unpleasantness of pain, and less observed facial expression of pain than the control group. Joung tested music played during gynecologic surgery and in the immediate postoperative period (n = 48), which resulted in significantly lower pain than no music (1999).

Other researchers in Korea reported the types of music offered to test self-selected music for anxiety during three 30-minute periods before hysterectomy. Participants listened to music the evening before surgery, just before sleeping, and in the morning before the operation. Of the 20 patients in the music group, 8 (40%) chose religious music, 6 (30%) chose light music, 5 (25%) chose classical orchestra music, and 1 (5%) chose American popular songs (Park & Choi, 1997). Significantly greater pre- to posttest decreases in systolic blood pressure, serum cortisone, and blood glucose were found in the music group compared with the control group, with no difference in state anxiety.

The Good and Moore (1996) nursing pain management theory proposes that multimodal therapy, attentive care, and patient education are needed for optimal pain relief. In addition to analgesic medication, nonpharmacologic methods are needed. The mechanism for the effect of music can be found in Melzack and Wall's (1965) Gate Control Theory that mental attention to a distracting device can modify the transmission of potentially painful impulses in the spinal cord. Music provides input into the central nervous system which attends to the music rather than the pain (Fuster, 1980; Willis, 1985). The pleasant and familiar stimulus of music relaxes muscles, distracts thoughts from pain and illness, evokes an affective response, and via descending nerve fibers closes the gate to perception of the sensory and affective components of pain (Good, Anderson, Ahn, Cong, & Stanton-Hicks, 2005). The reduced tension also decreases the sympathetic nervous system stimulation of the hypothalamus, which activates endogenous opiates to inhibit the transmission of impulses that result in pain (Beary & Benson, 1974). These mechanisms are intertwined with a relationship between the nature of the music and the person (Meyer, 1956). The benefit of music depends on familiarity with and liking the music as well as culturally based expectations.

METHODS

Study Aims

The primary aim was to examine the effectiveness of music in reducing postoperative pain in patients in Korea. The secondary aim was to investigate the musical preferences of postoperative women in Korea. The goal was to develop effective music for Korean women to use with analgesic medication. The following hypotheses were tested:

1. Postoperative patients in the music group will have significantly less sensation and distress of pain than those in the control group.
2. The types of music will not be related to posttest pain in the experimental group.

Design/Methodology

A quasi-experimental pretest-posttest design was used, with one music group and one control group. The women were given their choice of music after listening. Music was tested during rest on postoperative days 1 and 2 in the morning and afternoon.

Sample

The first author recruited a convenience sample of 73 patients scheduled for gynecologic surgery after admission to the surgical nursing unit of a university hospital in a large city in South Korea. The sample size was based on medium effect sizes found in a previous U.S. gynecologic surgery study (Good et al., 2002). Alpha was set at .05, one-tailed, power = .80, based on analysis of covariance.

Patients eligible for the study were 20 to 70 years old, were expected to have an abdominal incision, and were expected to use patient-controlled epidural analgesia (PCEA; 59%) or nurse-given intramuscular (IM) or intravenous (IV) analgesics (41%). Those with perineal, laparascopic, or small incisions were excluded, as were those who were opioid dependent. The first author screened and approached all eligible patients on the surgery list the day before surgery. She assigned the 78 who consented according to alternate days of the week. Participants recruited on Monday and Wednesday were assigned to the control group (n = 40; 51%), and those recruited on Tuesdays and Thursdays were assigned to the music group (n = 38; 49%); none were recruited on Fridays. Five subjects withdrew after surgery, saying that they were in pain and did not want to be bothered with participation in the study; four were in the music group and one was in the control group.

The final sample was 73 participants, with 34 (47%) in the music group and 39 (53%) in the control group, mean aged 41 ± 9 years. The majority were married (85%), Buddhist (55%), and housewives (70%), had completed high school or more (60%), and were from middle- or lower-class households with a monthly income of 2.5 million won ($2,500) or less (55%).

Participants underwent a variety of abdominal GYN surgical procedures: hysterectomy, n = 30, 41%; cesarean section, n = 14, 19%; myomectomy, n = 10, 14%; salpingectomy/oophorectomy, n = 7, 10 %; radical hysterectomy/lymph node dissection, n = 7, 10%; cystectomy, n = 4, 5%; and retroperitoneal mass removal, n = 1, 1%. The majority underwent surgery for benign disease, n = 46, 63%; the remainder had surgery for full-term pregnancy (n = 14; 19%) or cancer (n = 13; 18%).

Experimental Intervention

Three tapes of Korean music and two tapes of American music were offered as choices to the Korean women. The Korean music was chosen based on the results of a previous survey of 52 women before GYN surgery. Women in the survey were interested in nonpharmacologic methods of pain control in addition to analgesics for pain after surgery. They were especially interested in music, relaxation, and meditation (Ahn & Kim, 2004).

From a list of 19 types of music in the survey, the three types of Korean music most frequently chosen were Korean ballads (from the 1970s to 1980s), Korean religious music (Buddhist and Protestant), and popular music heard in Korea (Ahn, 2005). The two types of American music most frequently chosen were American piano music (oldies) and orchestra (classical) music (Ahn, 2005). The two tapes of American music contained instrumental music that was without lyrics and sedative in nature, with a sustained melodic quality, a rate of 60 to 80 beats per minute, and a general absence of strong rhythms or percussion (Gaston, 1951; Good et al., 2000). The Korean music was faster, 80-110 beats per minute, and had stronger rhythms and greater variation in volume and pitch than the American music. In addition, it contained Korean lyrics. An audiotape of each type was made by Dr. Ahn in Korea and reviewed by Dr. Good and two doctoral students in the U.S. to determine the rate, rhythm, and any variations in volume and pitch. They recommended that the music be used, because it was music liked by Koreans, but that the differences between it and the American music be described.

In this study, participants in the music group listened to a short excerpt of each of the five types of music and chose the type that would be most relaxing or distracting for pain after surgery. The majority (n = 22; 59%) chose the Korean selections, including ballads (n = 13; 38%), religious music (n = 7; 21%), and

popular songs (n = 1; 3%). Over one-third (n = 13; 38%), chose American music: orchestra (n = 8; 24%) and piano music (n = 5; 15%). They then practiced letting the music relax or distract them for 2 minutes. To ensure the correct use of the tape, the RA gave them positive reinforcement and suggestions for listening in a relaxed manner.

Postoperatively, during two 15-minute tests on day 1 and day 2, the investigator brought the tape, a small tape recorder, and earphones to the bedside. Participants listened to the music while lying in bed in the morning and afternoon each day.

Measures

The sensory component of pain, or the feeling of pain at the incision, was measured by the Sensation of Pain visual analog scale (VAS) (Good, Stiller, Zauszniewski, Stanton-Hicks, Grass, & Anderson, 2001). The affective component of pain, or the amount the patient was bothered emotionally by the sensation, was measured by the Distress of Pain VAS. The scales consist of a 100-mm horizontal line with verbal anchors of "no sensation" to "most sensation" and "no distress" to "most distress." Participants marked the sensation scale to indicate the amount of physical pain felt at the area of the operation. And then they marked the distress scale to indicate how much the sensation bothered them. The line was measured from the left in millimeters to determine interval scores.

Test-retest reliabilities over 15 minutes have been reported in U.S. postoperative patients as 0.73 to 0.82 (Good et al., 2001), and in the present Korean study they were similar, ranging from 0.74 to 0.88 for sensation and 0.72 to 0.85 for distress. Good has supported concurrent validity by strong positive correlations with scores on the Pain Rating Scale-Ranked (PRI-R) of the McGill Pain Questionnaire (Melzack, 1983) for sensation ($r = 0.44$; $p < .001$) and distress ($r = .55$; $p < .001$) (Good, 1995). Construct validity ranged from $r = 0.72$ to $r = 0.85$ (Good et al., 2001).

At the end of the study, The RA conducted a structured interview to ask those in the music group how they used it (to relax or distract or both), whether it was calming (no, a little, a moderate amount, or a lot), the perceived helpfulness of the music (no, a little, a moderate amount, or a lot), and whether it made them sleepy (no, yes). Demographic and medication information was collected from the medical record and during the interview.

Data Collection

After translation and back-translation of the instrument and cultural review by native Koreans, Investigational Review Board approval was obtained from a university in the U.S. and the study hospital in South Korea. The data were collected in Korea during 2003. Preoperatively, in collaboration with nurses on the unit, a researcher selected patients admitted before surgery and explained the study to them. After signing the informed consent form, participants were told they were assigned to the music or the control group. Those in the music group listened to a tape, chose the music, and practiced. The recruiter engaged those in the control group in informal conversation, instead of asking them to listen to a tape. Splinting the incision was taught to both groups.

To test the music interventions, an RA visited participants twice on each of the first 2 days after surgery at 10 a.m. and 2 p.m., to sample several time points and control for circadian variation in pain. She first asked them to mark the sensation and distress scales while resting in bed. Next, those in the music group listened to 15 minutes of their chosen music tape and those in the control group rested in bed for the same amount of time. Then, the RA asked participants to mark the sensation and distress scales again. After the final test on day 2, the RA conducted the interview and reviewed the medical record.

Data Analysis

To test the hypothesis that music will reduce pain after GYN surgery in Korea, multivariate analysis of covariance (MANCOVA) was conducted at each of the four time points. Posttest sensation and distress were the multivariate factors, and pretests were covariates. Pretest equivalence of groups was determined by *t* tests and chi-squared. Covariates were selected for the analysis if their correlation with dependent variables was $\geq .30$ (Cook & Campbell, 1979). To test the hypothesis that the types of music are not related to posttest pain in the experimental group, Spearman correlations were done between Korean and American music and posttest sensation and distress.

RESULTS

Mean sensation and distress scores for each group at each of the pre and posttests are shown in Table 1 and Figure 1. Pretest means for pain sensation and distress on day 1 were 33 to 42 mm and on day 2 were 22 to 30 mm. Large standard deviations indicated wide variations in pain perception, but the variance was homogeneous between groups.

The groups did not differ on pretest sensation and distress scores or on employment status, income, or marital status. However, the music group was younger (mean 37 ± 7 years) than the control group (mean 46 ± 9 years; $t(71) = 4.97$; $p < .001$), and more in the

TABLE 1.
Pain Means, Standard Deviations, with Multivariate and Univariate Analysis of Variance (MANCOVA) Results (N = 73)

		Music (n = 34)				Control (n = 39)							
		Pretest		Posttest		Pretest		Posttest		MANCOVA			
Time Point	Analysis*	M	SD	M	SD	M	SD	M	SD	F	df	*p*	ES
Day 1 a.m.	Multivariate	40[a]	20[a]	30	23	35	20	32	18	2.25	2,68	.06	.27
	UV Sensation	37	22	31	21	35	19	33	18	2.50	1	.06	
	UV Distress	42	25	29	25	35	22	31	19	4.55	1	.02	
Day 1 p.m.	Multivariate	34	20	24	19	34	17	33	17	6.26	2,68	.002	.42
	UV Sensation	35	18	25	19	33	16	32	16	11.46	1	.001	
	UV Distress	33	22	24	20	35	19	33	18	9.81	1	.002	
Day 2 a.m.	Multivariate	29	19	21	19	29	20	26	16	2.64	2,68	.04	.22
	UV Sensation	28	16	23	17	30	22	26	16	1.82	1	.09	
	UV Distress	27	21	20	21	27	18	25	17	5.38	1	.01	
Day 2 p.m.	Multivariate	23	18	17	15	26	18	23	16	6.89	2,68	.001	.21
	UV Sensation	23	16	17	14	27	19	25	17	8.28	1	.003	
	UV Distress	22	20	17	16	25	16	21	15	.81	1	.19	

ES = effect size between groups at posttest: $(M_{control} - M_{music})$/pooled standard deviation. Means and standard deviations were rounded to whole numbers.
*Multivariate means and standard deviations were calculated by averaging those for sensation and distress and rounding. The multivariate dependent variable analyzed with MANCOVA was composed of pain sensation and pain distress. UV = univariate dependent variable; analysis of sensation and distress separately.

music group had at least a college education (53% vs. 23%; $\chi^2(2) = 7.9$; $p = .02$), underwent surgery for benign disease or full term deliveries (92% vs. 8%; $\chi^2(2) = 8.8$; $p = .01$), and received IM/IV analgesia (62% vs. 23%; $\chi^2(1) = 11.23$; $p = .001$). More in the control group had at least a high school education (46% vs. 35%), had malignant disease (26% vs. 9%), and received PCEA analgesia (77% vs. 38%). These differences were probably due to differences in surgeons and types of surgeries scheduled on different days of the week. However, age, education, type of surgery, and pain control method were not correlated with posttest pain sensation or distress at any of the tests, and therefore they were not used as covariates. Pretest pain scores correlated strongly with posttest sensation (r = 0.75 to 0.89; $p < .001$) and distress (r = 0.73 to 0.86; $p < .001$) and were used as covariates. Statistical control of pretest pain also controlled for any effects of group differences in demographic and health variables on pain.

Hypothesis Testing

The hypothesis that music results in significantly less pain than no music was mainly supported. When controlling for pretest sensation and distress, MANCOVA indicated that on day 1 p.m. and day 2 a.m. and p.m., the postoperative patients in the music group had significantly less pain (sensation and distress) at posttest than those in the control group (Table 1). Univariate tests for both sensation and distress supported the multivariate effect on day 1 in the afternoon, but on day 2 only one component of pain was significant (distress in a.m., sensation in p.m.) and carried the multivariate effect (Table 1). The standardized posttest effect sizes in Table 1 were small to medium (effect size = $[M_C - M_M]$/pooled SD). The hypothesis that the types of music are not related to posttest pain in the experimental group was supported. Spearman correlations with sensation and distress were not significant.

CLINICAL SIGNIFICANCE

Patients in the music group reported 23% less pain than control patients after listening to music on day 1 p.m. and 15% less pain on day 2 a.m. and p.m. On day 1 a.m., the music group had 17% less pain than control patients. Percentage less pain was calculated as $(M_C - M_M)/M_C$, after pooling the sensation and distress scores in each group.

The number needed to treat (NNT) is the prevailing way to convey the efficacy of a tested intervention to practitioners (Cepeda et al, 2006; McMahon & Koltzenberg, 2005 [p. 540–642]). It represents the number of participants nurses need to treat with music for one person to receive 50% pain relief, who would not

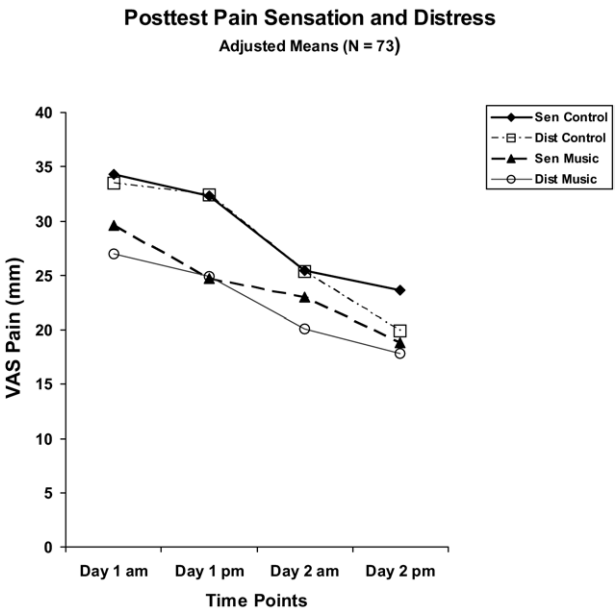

FIGURE 1. ■ Posttest sensation and distress of pain means, adjusted for pretests, at four 15-minute tests of music on postoperative days 1 and 2, after gynecologic surgery in Korea. Pain sensation and distress were measured with 100-mm visual analog scales (VAS).

receive that much relief if they had not been exposed to music (Cook & Sackett, 1995). To calculate the NNT, the number of those with 50% pre- to posttest relief was divided by the group size to yield a proportion. In the music group the 8 out of 34 with 50% relief was a proportion of 0.24, and in the control group the 1 out of 39 meant a smaller proportion of 0.03. The absolute risk reduction (ARR) was the probability in the music group minus that in the control group: 0.24 − 0.03 = 0.21. The NNT was calculated as 1/ARR (Personal communication, S. Cepeda, June 2006). The NNT for 50% relief of pain sensation in this sample was five patients at the time of the greatest effect, at day 1, p.m. It is the same as the NNT from synthesis of 11 postoperative studies in the Cochrane Review (Cepeda, et. al, 2006). For pain distress, the NNT was 4.

However, other research indicates that patients with moderate (4-6 cm) pretest pain reported that 35% reduction in response to analgesics was "meaningful" (Cepeda, Africano, Polo, Alcala, & Carr, 2003), and only patients with severe pain (>6 cm) considered a 50% reduction to be meaningful. In the present study, the NNT was 3 for 35% reduction in those with moderate pain. Of the 14 participants in the music group with moderate pain sensation, five (36%) obtained ≥35% relief; none of the eleven controls with moderate sensation obtained that much relief. None of the five participants with severe pain had 50% relief (three music, two control).

The majority in the music group said they used music for both relaxation and distraction, that it was moderately to very calming (80%), that it made them sleepy (53%), and that it decreased the distress of pain a moderate amount or a lot (62%); fewer said it decreased sensation a moderate amount or a lot (29%). Of those who listened to music, 67% said they liked it, 29% loved it, and only 4% disliked it. These responses did not differ between those who chose Korean or American tapes. Nearly all in the music group said that they would use music again if they were having surgery and would recommend it to others (n = 31; 91%).

DISCUSSION

A limitation of this pilot study was lack of random assignment to the experimental and control groups. Although the groups were not balanced in age, education, type of surgery, or pain control method, the imbalances did not affect pain. In addition, the groups were comparable on pretest pain scores. However, unknown differences may have been present. For example, the most recent dose of analgesic pain was not known, and pain may have been affected the meaning of the health condition (Cesarean section or malignant tumor). In addition, half of the patients received PCEA and nearly half received IV or IM analgesia. This is an example of the reality that occurs in nursing studies when concurrent medical practice is in a process of change during data collection. Even so, patients with both analgesic systems suffered mild to moderate pain; the groups had similar pain at pretest. Music reduced pain in patients with either system. Another limitation was the modest sample size which may have resulted in some small effect sizes.

Korean women's pain following GYN surgery was significantly relieved after 15 minutes of music on three of the four tests on days 1 and 2 compared with a no-music control group. There was a trend toward less pain at the fourth test. The findings are similar to those found in the U.S. and several other countries (Good & Chin, 1998; Good et al., 1999; Phumdoung & Good, 2003; Salem, 2004). The findings of these studies suggest that if music had not been offered, patients would have suffered more.

In addition, both Korean and American music was effective, with no difference in pain. This suggests that personal choice and culturally congruent choice may be important for pain relief. In contrast, the Cochrane Review (Cepeda et al., 2006) did not find that choice of music made a difference in pain relief. However, it seems reasonable that patients in pain be offered mu-

sic they like if they are to listen to it. Research on musical preferences and expectations in other cultures (Good et al., 2000; Krumhansl et al., 2000) provides evidence for our use of familiar music that people like to hear. Our data on liking of the music suggests that if Korean music had not been offered, the majority of patients would have been treated with a less preferred type of music. They may not have wanted to listen. Given a choice, most liked or loved the music, used it to relax and distract themselves from pain, became calm and sleepy, and had less distress pain.

Investigators of music for pain often do not address cultural preferences (Cepeda et al., 2006). Some investigators in other countries have found Good's American music tapes effective, and others have tested the music of their own culture (Park & Choi, 1997). After choosing by listening, the similar relief gained with either Korean or American music suggests that qualities in each type of music were important to the individual patient for relaxing muscles and/or being mentally distracted from pain. The majority chose Korean music, which supports the importance of providing culturally congruent choices. Nevertheless, the Korean women who chose American music were probably familiar with Western classical and popular music, and those who chose the slower American music may have found the soft quality calming.

CONCLUSIONS

These results support the Good and Moore (1996) theory. A balance of pharmacologic and nonpharmacologic methods provided up to 23% better pain management than analgesics alone. This reduction was similar to that seen with American music in the U.S. (Good, Albert, Anderson, Wotman, & Cong, in preparation; Good et al., in review). People have often asked whether only sedative music can relieve pain. The Korean music was somewhat faster and contained more crescendos than in the sedative tapes provided by Good. No difference in effect was found in this sample, suggesting that familiarity and liking of the music may have prevailed over sedative qualities for those who chose Korean music. We propose that ability to relax and/or be distracted from pain is based not on just any music, but on individually chosen music that is familiar, liked, and has meaning for the person. In addition, the tempo, language, and cultural congruence are important.

The investigator who developed the Korean music tapes used Meyer's (1956) theoretic ideas when she selected the music: The therapeutic effects of music are based in part on an interaction between the music and the person, and liking and familiarity are important. The perspective was that Koreans like lyrics in their own language and that hearing the words of a comforting song helps patients feel comforted. This is especially true for religious songs when religious people comprise the patient population. The words in Buddhist hymns impart the familiar and comforting teachings of Buddha to patients who have heard them read many times by monks during worship. The vocal rhythm makes them feel blessed and creates a peaceful feeling. To Christian Koreans, hearing the words of familiar hymns in their own language reminds them of God's presence during their recovery.

We recommend that this preliminary study be replicated with a larger sample size and random assignment to groups, using urn or computer methods to blind the allocation. Stratification on potentially confounding variables is recommended (Zeller, Good, Anderson, & Zeller, 1997). Korean music that appeals to men can be developed and tested to determine whether it is liked and provides relief of pain in men after surgery. In future studies that compare culturally different types of music, we recommend that participants be interviewed afterward to learn what it was about the music that influenced their choice. Culturally appropriate music also can be selected and tested by people in other countries and cultures.

Based on this study and others, an empirical basis exists for practicing nurses to offer music including culturally and religious-based music along with other choices after surgery. For 50% pain reduction that would not be obtained without music, the NNT was 4 or 5 (distress and sensation, respectively). However, in those with moderate pain sensation, the NNT was 3 patients to obtain a 35% reduction. Although this much relief could be obtained with additional medication (Cepeda et al., 2006), music has further benefits of no additional side effects, less anxiety and depression, and increased sense of power (Good et al., 2002, 2005; Siedlecki & Good, 2006; Voss et al., 2004). Offering a variety of music that includes some that is culturally appropriate and asking patients to listen to 20 seconds of each type of music before making a choice will result in a closer match between the person and the music. The types of music used in this study were well liked and could be used in Korea or with Korean women who are patients in the U.S. or other countries. Nurses in many countries and cultures can select culturally sensitive music to be used along with analgesic medication to improve pain relief in their patients.

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