



Pain and anxiety amongst a surgical population:
What effect does holistic nursing have?

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Abstract

The purpose of this quantitative research study was to evaluate a holistic perioperative medicine program that used non-pharmacological strategies to help patients manage pain and anxiety related to surgery. The research occurred in two phases. Phase one occurred before surgery and examined the effects of a one-hour holistic healing therapies (HT) session on anxiety and pain pre-post session (n=111). HT session modalities included guided imagery, eye pillow, aromatherapy, and a written personal healing plan. As predicted, patients significantly reduced anxiety and pain after the HT session. Phase two occurred after surgery, wherein patients (n=72) rated their satisfaction with how well the HT program addressed their physical, emotional, and spiritual needs. In addition, they reported how often they used HT components before, during, and after surgery. Most patients rated the program favorably. The majority of patients reported using program components to prepare for surgery, and many used them after during recovery. Findings offer promising scientific support for integrative medicine programs to help patients manage anxiety and pain related to surgery. Future studies should include randomized control trials to examine effective ingredients and underlying mechanisms of effects.

Keywords: Integrative medicine, holistic medicine, state anxiety, pain, surgery

Introduction

Preparing for surgery is a stressful and often anxiety-provoking situation for patients (Ebirim & Tobin, 2011). Patients may already be in physical pain by virtue of their medical conditions. Treating anxiety and pain effectively may increase patient satisfaction with medical care. In turn, patient satisfaction is one criterion for financial reimbursement for many hospitals, e.g., through the national Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. Thus, finding effective and comprehensive ways to manage patient anxiety and pain is vital.

The aim of holistic medicine is to treat the whole person—body, mind, and spirit—therefore, programs designed from this perspective may be particularly well-suited to addressing patient anxiety and pain. Nurses are well-positioned to offer holistic modalities to patients given their direct and frequent patient contact. Thus, the goal of the present study was to evaluate a holistic perioperative medicine program for its ability to manage patient anxiety and pain before surgery, and to address patients' physical, emotional, and spiritual needs before, during, and after surgery. Our program was developed and delivered primarily by nursing staff, as well other health professionals trained by nursing staff.

The increased use of complementary therapies has led researchers and health care professionals to seek out answers regarding the effectiveness of such therapies. In order to begin this exploration, it is important to distinguish between the terms “complementary therapies” and “integrated medicine.” According to O'Regan, Wills, and O'Leary (2010), complementary therapies are the individual non-pharmacological modalities that may be found within a health care setting, (i.e. the use of eye pillows, guided imagery meditation, healing touch, and aromatherapy), whereas integrated medicine refers to how complementary therapies and modern medicine interact to treat the whole patient. Although not much research has been done on the use of these therapies in conjunction with each other, research on individual components support their use in clinical settings.

Guided Imagery encourages the patient to relax and breathe deeply while being led through a series of healing images produced by the patients' imagination (Bonadies, 2009; Cooper & Stollings, 2010; Miller, 2003). In an oft-cited study examining the physiological effects of guided imagery on surgical stress and wound healing, Holden-Lund (1988) reported that patients who received a guided imagery intervention showed reduced anxiety after surgery as well as decreased redness at wound margins the first day after surgery. Furthermore, Gonzales et al. (2010) reported that an experimental group who received guided imagery showed reduced pre-operative anxiety. Guided imagery therapy appears to be one of the most common complementary therapies as well as one of the most researched.

Aromatherapy is another modality that is gaining popularity within modern health care. Aromatherapy uses essential oils from plants, such as sage, lavender, and vanilla, to help in the treatment of mind and body (Mudd, 1996; Nourbakhsh & Taavoni, 2012). In a study of 17 hospice patients found that patients reported a reduction in pain and anxiety when exposed to lavender aromatherapy (Louis & Kowalski, 2002). Although this reduction was small, Louis and Kowalski (2002) argue that with a larger sample size and with increased exposure the effects may be greater.

Finally, healing touch therapy may aide in anxiety reduction and improved immune function. Unlike guided imagery, healing touch involves a direct relationship between the practitioner and the patient. The intent of healing touch is for the practitioner to work within the energy surrounding the patient. By using gentle physical touch or no touch at all the practitioner

theoretically can remove blockages from the patient's energy field (Wilkinson et al., 2002). In their 2002 study, Wilkinson et al. used saliva samples to track sIgA (which corresponds with immune function) in clients receiving healing touch for the first time. Results pointed to greater changes in sIgA for the clients when the healing touch therapist had more experience. Through self-report, clients also noted increased emotional and mental health and increased relaxation (Wilkinson et al., 2002).

Each of the above modalities individually has been shown to assist in the reduction of pain and anxiety in medical situations. Although many medical centers are developing programs using these modalities, little research exists on the effects of multiple modalities delivered as a program. Therefore, the goal of the present study was to evaluate a holistic perioperative medicine program, which incorporated several different complimentary therapies, for how well it helped patients manage pain and anxiety related to surgery.

Method

Participants

Participants in this study were surgical patients at Mercy Regional Medical Center. Participants were invited to participate by the Healing Therapies nursing team at the beginning of a one hour Healing Therapies (HT) session. 146 patients were asked to participate and of those asked, 35 declined stating, "Not enough time," and "too much paperwork" as two of the reasons.

Patients participating in the initial measure, prior to the HT session (T1), and those participating in the measure immediately after the HT session (T2) totaled 111. Of these 111, 67.6% (n = 75) were female and 32.4% (n = 36) male. Although participant's ages ranged from 18-90, the majority (55%) were in the 50-69 age range. Ethnic backgrounds for participants were White/Non-Hispanic 84.7% (n = 94), Native American 4.5% (n = 5), Hispanic/Latino/a 9% (n = 10), African American, 1% (n = 1), and Asian/Pacific Islander 1% (n = 1). Faith traditions for patients were Christian 64% (n = 71), None 4.5% (n = 5), Native American 3.6% (n = 4), Atheist 1.8% (n = 2), Buddhist 1.8% (n = 2), Compassion 0.9% (n = 1), Nature .9% (n = 1), Pagan .9% (n = 1), prayer/ritual .9% (n = 1), Spiritual-not-religious .9% (n = 1), Wicca 0.9% (n = 1), and no answer 19% (n = 21).

Patients were part of a surgical population with in-patient surgeries scheduled. Scheduled surgeries were, spine 50.5% (n = 56), knee 18% (n = 20), hip 17.1% (n = 19), c-section 4.5% (n = 5), hysterectomy 2.7% (n = 3), mastectomy 2.7% (n = 3), and other 4.5% (n = 5).

Design

This study was longitudinal in design with (T1) being completed before the HT session, (T2) being completed after a 1 hour HT session, and a third measure, (T3), was given to patients after surgery. For this paper, only T1 and T2 results will be discussed. Pain and state anxiety were the primary focus of the T1 and T2 measures, and the design used for these measures was a pre-post, within groups, repeated measures design.

Materials, Measures, and Procedure

Our pre (T1) and post (T2) measures were given before and after a 1 hour HT session. This session is given in special rooms that had been set aside for the purpose of this program. The HT room is set up with a massage type bed, a small waterfall, and other similar items to help induce a feeling of safety and relaxation.

All patients who desired to be in this study were asked to give informed consent. Next, the participant was asked to complete the T1 measure. This measure consisted of a 6 item anxiety scale (STAI6; Marteau & Bekker, 1992; Tluczek, Henriques, & Brown, 2009) of the State form (Form Y-1) of Spielberger's (1983) State-Trait Anxiety Inventory (STAI). Researchers Marteau

and Bekker (1992), and Tluczek, Henriques, and Brown (2009), have found this 6 item version to be a reliable representation of the longer 20 item state anxiety measure. The 6 item scale asks participants to rank their answers on a 4-point Likert scale (1 = Not at all; 2 = Somewhat; 3 = Moderately so; 4 = Very much so) based on how they were feeling at that moment.

Other questions on the T1 measure were a standard pain inquiry (likert scale 1-10) and two author constructed questions designed to analyze self-empowerment and hopefulness. Basic demographics addressed were age, gender, ethnic background, faith tradition, and type of surgery planned. Each session began with the nurse leading the patient through a personalized healing plan (appendix). This plan consisted of identifying areas of fear and addressing those areas using personal affirmations. The patient is also given an aroma-therapy and an eye-pillow. During the second part of the therapy, the patient relaxed on the massage table while listening to a guided imagery CD and receiving healing touch therapy.

At the end of the session, the participant was asked to complete the T2 survey. The T2 measure was similar to the T1 in that the 6 item anxiety measure and the 10 point pain scale were both repeated. Participants were then asked which components of the HT session they were given. Of the 111 participants, 103 (93%) participated in all aspects of the session. All participants were given materials to take home in order to continue use before and after surgery.

Results

We analyzed all data using SPSS for Windows 18.0.0. Alpha for statistical significance is set at .05. We conducted paired samples *t*-tests to assess the pre-post effects of the one-hour HT session on state anxiety, physical pain, hopefulness, and empowerment. Table 1 displays results. As predicted, patients reported statistically significant reductions in anxiety and pain. In addition, patients reported significant increases in hopefulness and empowerment.

To compare our patients' state anxiety scores against published norms, we conducted one-sample *t*-tests between our pre (T1) and post (T2) state anxiety means and those reported by Spielberger (1983) for a general medical surgical sample and for working adults. We prorated the means for our 6-item state anxiety scale to allow comparison with the 20-item version. Our pre-session (T1) scores ($M = 61.83$, $SD = 17.16$) were significantly higher than norms for both the general medical surgical ($M = 42.38$, $SD = 13.79$; $t(108) = 11.83$, $p = .001$) and working adult samples ($M = 35.20$, $SD = 10.61$; $t(108) = 16.20$, $p = .001$). Our post-session (T2) scores ($M = 41.11$, $SD = 12.06$) were equivalent to norms for the general medical surgical sample ($M = 42.38$, $SD = 13.79$; $t(108) = -1.09$, $p = .276$), and significantly higher than the working adult sample ($M = 35.46$, $SD = 10.61$; $t(108) = 5.12$, $p = .001$).

As possible moderators of the effects of the 1-hr HT session on pre-post changes in anxiety and physical pain, we examined demographic (i.e., sex, age, race, faith tradition), and surgery-related (i.e., number of days before surgery, type of surgery planned) variables. We used two-way mixed design ANOVAs to conduct these interaction analyses (between group moderators x within-groups pre-post repeated-measures for STAI6 and Pain). Table 2 displays results for gender and session practice as significant moderators. Interactions were not significant when testing age, race, faith tradition, number of days before surgery, or type of surgery planned as moderators.

Significant gender interactions emerged for state anxiety. Follow-up analyses by independent samples *t*-tests revealed that before the HT session, females reported significantly higher levels of anxiety than did males ($t(107) = 3.71$, $p = .001$). After the session, both females and males significantly reduced anxiety (see Table 2), and converged to anxiety levels similar to each other ($t(107) = 0.47$, $p = .628$).

Discussion

As predicted, patients in our study significantly reduced anxiety and pain after a one-hour holistic healing therapies session using multiple modalities including guided imagery, aromatherapy, eye pillow, and creating a written personal healing plan to prepare for surgery. The program appeared useful to a broad range of people in that most demographic and surgery-related variables did not moderate effects. Gender effects emerged, but only such that women entering the study reported higher initial anxiety than men. Both men and women significantly reduced anxiety as a result of the HT session, and converged to levels similar to each other after the session.

Strengths of our study include the longitudinal design with pre-post measurement of the effects of the HT session with standard anxiety and pain scales. The research occurring in the context of clinical care increases the external validity of our findings. Our participants were actual surgical patients, not just individuals imagining a medical stressor. Finally, our procedure of having patients return surveys in sealed envelopes in a locked security box increases data integrity and reduces the likelihood of research demand characteristics. In other words, this process minimizes the likelihood that patients were simply responding in a socially desirable manner to please their individual healthcare provider.

The major limitation of our study regards internal validity due to the lack of a control group for effects of the HT session. We do not know for sure whether the pre-post reductions in anxiety and pain are due to the HT session, or merely the passage of time, in this case one hour. We did not have a control group for a number of ethical and situational reasons. Because this research occurred in the context of clinical care for an existing program, we did not feel comfortable at this point offering the program to some individuals and not others. Future studies should use randomized control trials to examine whether programs (or individual components) are more effective than an attentional control or simply the passage of time.

A second limitation is that our outcome measures are self-report. Additional outcomes for future research might include whether this type of program reduces surgical inpatient length of stay, pain medications used, or changes in immune function. Pain and anxiety are by definition subjective, so self-report measures are appropriate. However, additional outcomes could be useful.

A final limitation regards external validity. Our sample included patients planning hip, knee, spine, c-section, hysterectomy, and mastectomy. The majority of these were planning spine surgery. Whether our findings would generalize to a broader population of surgical patients is a question for future research.

Overall our findings offer promising scientific support for holistic medicine programs and complementary modalities to help patients manage anxiety and pain related to surgery. By virtue of their frequent direct contact with patients, nurses are in a prime position to deliver these supportive interventions to patients. Future larger-scale studies using randomized control trials in a broader patient population will further strengthen the case for integrative medicine in hospital settings.

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Table 1
Paired Samples t-tests for Pre-Post Effects of Healing Therapies Session on State Anxiety, Physical Pain, Hopefulness, and Empowerment

DV	<u>Pre (T1)</u>	<u>Post (T2)</u>	<i>df</i>	<i>t</i>	<i>p</i>	% Δ
	<i>M (SD)</i>	<i>M (SD)</i>				
State Anxiety	3.09 (0.86)	2.06 (0.61)	107	13.08	.001***	-25.6%
Pain	3.83 (2.52)	2.64 (2.25)	94	7.15	.001***	-10.8%
Hopeful	3.51 (0.72)	3.76 (0.53)	104	-3.54	.001***	6.3%
Empowered	2.87 (0.96)	3.41 (0.81)	104	-5.96	.001***	13.5%

Notes. DV = Dependent Variable. The response format for State Anxiety, Hopefulness, and Empowered ranged from “1 = Not at all” to “4 = Very much so.” The response format for Pain ranged from “0 = No Pain” to “10 = Worst Possible Pain.” Percent change (% Δ) is calculated as the difference in mean scores between T2 and T1, divided by the total possible range of scores (e.g., for Pain $2.64 - 3.83 / 11 = -10.8\%$). Degrees of freedom vary somewhat across dependent variables due to missing data points for individual responses.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 2
Two-way Mixed Design ANOVAs for Significant Moderators of the Effects of the Healing Therapies Session on State Anxiety and Physical Pain

DV	Moderator	<u>Pre (T1)</u>	<u>Post (T2)</u>	<i>df</i>	<i>F</i>	<i>t</i>	<i>p</i>
		<i>M (SD)</i>	<i>M (SD)</i>				
Anxiety							
	Gender			1, 107	18.57		.001***
	Female	3.29 (0.81)	2.04 (0.61)	71		13.57	.001***
	Male	2.68 (0.81)	2.09 (0.59)	35		4.9	.001**
	Practiced in session			1, 105	8.08		.005**
	Yes	3.15 (0.85)	2.05 (0.60)	98		13.42	.001***
	No	2.41 (0.76)	2.14 (0.77)	7		1.86	.105
Pain							
	Practiced in session			1, 92	4.15		.045*
	Yes	3.90 (2.44)	2.61 (2.14)	87		7.36	.001***
	No	3.33 (3.77)	3.41 (3.75)	5		-1.00	.363

Notes. DV = Dependent Variable. *F*s are for two-way ANOVAs and *t*s for follow-up paired-sample *t*-tests comparing pre-post changes. Degrees of freedom vary somewhat across DVs due to missing data points for individual responses. Additional interaction analyses were not significant for age, race, faith tradition, number of days before surgery, or type of surgery planned. **p* < .05. ***p* < .01. ****p* < .001.

Appendix

PERSONAL HEALING PLAN FOR _____

- ❖ I create a healing environment with my music, aromatherapy, and eye pillow in a quiet comfortable space in my home.
- ❖ As I deeply breathe in and out, I relax my muscles, release tension, and observe my thoughts.
- ❖ Prayer or blessing _____

- ❖ My safe and nurturing place is _____

- ❖ My healing statements _____

- ❖ My image of myself healed and whole _____

- ❖ Short term surgery goals: Pre: _____

- ❖ During: _____

- ❖ After: _____

- ❖ I bring my eye pillow, aromatherapy, written healing statements, CD and CD player with small ear buds, labeled with my name, to the hospital on the day of surgery.
- ❖ I use my personal healing plan at least twice daily. I appreciate everyone involved in my healing.
- ❖ I share my healing statements with my health care providers, family and friends.
- ❖ On the day of surgery, I may request my anesthesiologist to play during surgery the music CD provided, or a CD of my choice, using small ear buds. This helps me maintain a relaxed state.