Perceived Discomfort, Pain and Nonpain Symptoms in a Postanesthesia Care Unit: An Observational Study

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Purpose: *To assess patient-perceived discomfort in a postanesthesia care unit (PACU) and to explore the contributing symptoms and related characteristics.*
Design: *Cross-sectional observation was used in this study.*
Methods: *Postgeneral anesthesia patients in a PACU were asked to report their overall discomfort level on a 0 to 10 scale and to report and rank the symptoms they were suffering. All data were analyzed with SPSS software.*
Findings: *The average level of perceived discomfort was 4.90 ± 2.669. A hierarchical regression model showed that pain and nonpain symptoms contributed 0.084 and 0.074 to the overall discomfort level, respectively. Dry mouth, sore throat, and urethral catheter discomfort were the most common nonpain symptoms. Sex, department, anesthesia duration, American Society of Anesthesiologists physical status classification and other symptoms were all related to symptom reports.*
Conclusions: *PACU patients suffer medium levels of discomfort, with pain and nonpain symptoms contributing nearly equally to it. In addition, multiple related characteristics were identified.*

Keywords: *discomfort, postanesthesia care, nonpain symptom, pain.*

PATIENT COMFORT IS A DESIRABLE holistic outcome in nursing. Nurses provide different interventions to promote comfort in various settings. The standards of perianesthesia nursing practice have identified comfort as an important criterion for assessment and management of the perianesthesia patient,[1] making comfort care a primary part of postanesthesia care unit (PACU) nursing.

The technical definition of comfort is not only a state of peace and serenity but also relief, ease, or transcendence from the discomfort.[2,3] The identification and resolution of discomfort is a basic goal in comfort care. Postoperative patients often suffer multiple symptoms because of the primary illness, anesthesia, and surgical operation. Pain is the most prominent discomfort in postoperative patients and has long been considered the main concern of comfort care in the PACU. A great deal of research on postoperative pain control has been reported in the literature. One frustrating fact is that pain is still far from being fully controlled.[4,5] Fortunately, comfort can be improved even if pain cannot be fully resolved.[6] On the basis of

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these facts, comprehensive management of pain and nonpain symptoms simultaneously would be of great importance in the enhancement of patient comfort in the PACU.

In contrast to pain, nonpain symptoms have been much less frequently discussed in the literature. Several different postoperative symptoms have been described, including postoperative nausea and vomiting (PONV), feelings of coldness, and discomfort related to prior intubation; the association of these symptoms, in combination with pain, was referred to as "postoperative discomfort" in 1999,[7] which to our knowledge first described the multidimensional symptoms co-occurring in postoperative patients. Closs and Briggs[8] reported that pain and nonpain symptoms are different based on careful analysis of pain and discomfort descriptions from postorthopaedic surgery patients; then Zegerman et al[9] described the nonpain postoperative symptoms, and showed that nonpain symptoms troubled the patients so much that they would still remember the unpleasant feelings 24 hours later. Robleda et al[10] assessed patients after abdominal surgery by asking them to rate their symptoms using a list of postoperative pain and nonpain symptoms, which revealed that nonpain symptoms—movement restriction and dry mouth—were the main causes of discomfort at 24 hours (pain 82% vs movement restriction 79% and dry mouth 70%). Many other researchers also discussed postoperative symptoms, but often focused on only one dimension—such as the interference to sleep because of drains after mastectomy[11]—or merely assessed the level of symptoms as a single nonpain symptom.[12-15] Studies aimed at systematically describing the postanesthesia symptoms and related characteristics are still lacking.

Comfort is a subjective concept, and the measurement of comfort depends on the perception of the patients. A symptom is defined as "the subjective evidence of disease or physical disturbance observed by a patient" in the Webster's Third New International Dictionary. In comparison with "sign," the perception of the patients is the essence of a symptom. When the patients and nurses were interviewed, their definitions of and concerns for comfort were very different, with the perianesthesia nurses most concerned about body position and pain management, whereas the patients mentioned other less obvious needs, such as self-esteem.[16] In a study regarding the perception of postoperative symptoms, significant differences between patients and health care professionals' perceptions were also identified.[17] Thus, the assessment of comfort level and symptoms should be based on the report of the patients to avoid neglecting troublesome issue that may be causing discomfort. Medical staff may still tend to trust their assumptions over patient's reports. A study from Zegerman et al[9] reported that many patients suffer from nonpain symptoms that were not dealt with properly by the staff because the staff did not consider the patients' complaints worth attending to. Such examples further emphasize the importance of assessing comfort level and symptoms based on patients' self-reports.

The overall discomfort level and the contributing symptoms in PACU patients were investigated in this study using self-report–based assessment. Related characteristics were also analyzed.

Study Questions

- What is the overall discomfort level of patients in the PACU?
- What are the main symptoms that contribute to discomfort?
- What characteristics are related to these symptoms?

Method

Study Design

Cross-sectional observation was used in this study. Patients were asked to report their overall discomfort level and to report and rank the specific symptoms they were suffering. For symptoms that cannot be clearly defined, the patients were encouraged to describe their feelings, and the symptoms were recorded as "location + discomfort."

Participants

Adult patients (aged >18 years) recovering in the PACU after elective surgery under general anesthesia were included. Exclusion criteria were (1) age < 18 years, (2) emergency surgery, (3) other types of anesthesia, and (4) inability to express their feelings because of postoperative mechanical

ventilation, unconsciousness, mental illness, or any other reason.

Ethical Considerations

The whole study process conformed to the Declaration of Helsinki and was approved by the ethics Committee at Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology (20130105). All participation was voluntary.

Data Collection

Basic characteristics including age, sex, and surgical specialty were transcribed from the medical records of the patients, and body mass index (BMI) was calculated by bodyweight in kilograms divided by height in meters squared. American Society of Anesthesiologists (ASA) physical status classification and anesthesia duration (in minutes) were recorded before anesthesia by nurses. When the patients arrived in the PACU, the nurse asked the patient to report their overall discomfort level on a 0 to 10 scale, with 0 representing "no discomfort at all" and 10 representing "the worst discomfort you can imagine." Then, the patients were asked about the specific symptoms that were troubling them. If more than one symptom was reported, the patient would then be asked to rank the symptoms. Nursing interventions were taken immediately when a symptom is identified, doctors were asked for treatment when necessary.

Data Analysis

The data analysis was performed using SPSS (version 18.0, SPSS, Inc, Chicago, IL). Continuous variables were expressed as the mean ± SD, and categorical variables were presented as the count (percentage). The one-way analysis of variance test was used to analyze the difference in discomfort score. The Mann-Whitney *U* test and Kruskal-Wallis test were used for comparison between two or more groups, and the Nemenyi post hoc test was used as well. Bivariate Spearman's rank correlation was used to quantify the association. Forward stepwise linear regression (*P* value for entry at .10) was performed to assess the contribution of different symptoms to the overall discomfort level, and then a hierarchical regression using the entered variables in the stepwise regression was performed with the nonpain complaints entered as a cluster. All statistical tests were bilateral, and the level of significance was $P < .05$.

Findings

BASIC CHARACTERISTICS. In total, 295 patients with a mean age of 39.3 were included in the study. Seventy-nine (26.8%) of them were male, and the average BMI was 22.7. A total of 20.7% of the patients were from the Eye, Ear, Nose, and Throat (EENT) Department; 34.2% of them were from the General Surgical Department; and 45.1% were from the Obstetrics and Gynecology (OBGYN) Department. The ASA classification in most of the patients (96.9%) was lower than 3, and the average anesthesia duration was 131.2 minutes (Table 1).

PATIENT-REPORTED OVERALL DISCOMFORT LEVEL. The overall discomfort level was assessed by asking the patients to rate their discomfort from 0 to 10, with 0 indicating no discomfort and 10 indicating the worst condition. The average score among the participants was 4.90 + 2.67, and no significant difference in the overall comfort level was found among departments, sexes, age groups, ASA classification, BMI score, or anesthesia duration groups (Table 2).

Table 1. Basic Characteristics of the Participants (N = 295)

Characteristics	n (%)	Mean (SD)
Male	79 (26.8)	
Age		39.3 (13.72)
BMI		22.7 (3.18)
Department		
EENT	61 (20.7)	
General surgery	101 (34.2)	
OBGYN	133 (45.1)	
ASA classification		
1	168 (56.9)	
2	118 (40)	
3	7 (2.4)	
4	2 (0.7)	
Anesthesia duration		131.2 (70.1)

ASA, American Society of Anesthesiologists; BMI, body mass index; EENT, eye, ear, nose, and throat; OBGYN, obstetrics and gynecology.

Table 2. Patient-Reported Overall Discomfort (N = 295)

Characteristics	Mean (SD)	*P*
Sex		.962
Male, n = 79	4.77 (2.778)	
Female, n = 216	4.94 (2.634)	
Age (y)		.392
< 30, n = 94	4.80 (2.650)	
30-50, n = 132	4.76 (2.760)	
>=50, n = 68	5.30 (2.511)	
BMI		.732
< 18.5, n = 23	4.91 (2.193)	
18.5-24, n = 180	4.96 (2.685)	
25-30, n = 84	4.86 (2.799)	
>30, n = 8	3.88 (2.357)	
Department		.595
EENT, n = 61	4.69 (2.661)	
General, n = 101	4.95 (2.662)	
OBGYN, n = 133	5.00 (2.688)	
ASA classification		.610
1, n = 168	5.08 (2.620)	
2, n = 118	4.64 (2.741)	
3, n = 7	4.86 (2.854)	
4, n = 2	5.00 (2.828)	
Anesthesia duration (min)		.432
< 80, n = 82	5.18 (2.602)	
80-150, n = 110	4.90 (2.685)	
≥150, n = 103	4.67 (2.669)	

ASA, American Society of Anesthesiologists; BMI, body mass index; EENT, eye, ear, nose, and throat; OBGYN, obstetrics and gynecology.

PATIENT-REPORTED SYMPTOMS. As shown in Table 3, among the 295 participants, 273 (92.54%) patients reported symptoms, 185 (62.71%) patients reported pain, and 181 (61.36%) patients reported nonpain symptoms. Dry mouth (19.66%) and sore throat (15.93%) were the most common nonpain symptoms. Urethral catheter discomfort, dizziness, somnolence, feeling cold, and PONV were also frequently reported symptoms. Symptoms reported by less than 10 patients include nasal discomfort, shivering, eye discomfort, numbness, abdominal bloating, precordial discomfort, headache, gastric tube discomfort, body positioning, asthenia, lisp, hunger, hand swelling, and cough.

CONTRIBUTION OF COMMON SYMPTOMS TO OVERALL DISCOMFORT LEVEL. Forward stepwise linear regression with the *P* value for entry at .10 was initially performed. Sore throat and somnolence were excluded in the analysis. Then, the hierarchical regression showed that the ΔR^2 for pain and nonpain symptoms were 0.084 and 0.074, respectively. Pain, urethral catheter discomfort, and PONV significantly affected the patient-reported overall discomfort, whereas dizziness negatively affected the overall discomfort. Dry mouth and feeling cold showed nearly significant effect on the overall discomfort level (Table 4).

CHARACTERISTICS RELATED TO SYMPTOMS. A comparison of symptoms in male and female patients was conducted using the Mann-Whitney *U* test. The Kruskal-Wallis test was used to compare symptoms in patients from different departments, and the Nemenyi post hoc test was conducted if significant differences were observed. Female patients rated pain and PONV higher than male patients. Significant differences in pain rankings were also found in different departments (Table 5). The post hoc Nemenyi test showed that patients from the EENT Department rated pain higher than patients from the General Surgery Department ($P = .003$) and OBGYN ($P = .007$).

Table 3. Common Symptoms and the Correlation With Overall Discomfort (*N* = 295)

	Total n (%)	Rank 1 n (%)	Rank 2 n (%)	Rank 3 n (%)	Rank 4 n (%)
Pain	185 (62.71)	148 (50.17)	34 (11.53)	3 (1.02)	0 (0.00)
Dry mouth	58 (19.66)	41 (11.53)	15 (5.08)	2 (0.68)	0 (0.00)
Sore throat	47 (15.93)	34 (11.53)	10 (3.39)	3 (1.02)	0 (0.00)
Urethral catheter	27 (8.14)	14 (4.41)	11 (3.05)	1 (0.68)	1 (0.00)
Dizziness	27 (9.15)	9 (3.05)	13 (4.41)	5 (1.69)	0 (0.00)
Somnolence	20 (6.78)	4 (1.36)	12 (4.07)	3 (1.02)	1 (0.34)
Feeling cold	13 (4.41)	5 (1.69)	7 (2.37)	1 (0.34)	0 (0.00)
PONV	11 (3.73)	4 (1.36)	6 (2.03)	1 (0.34)	0 (0.00)

PONV, postoperative nausea and vomiting.

Table 4. Contribution of Symptoms to the Overall Discomfort Level (N = 295)

	ΔR^2	β Value	Standardized β Value	95% CI	*P*
Pain	0.084	0.330	0.290	0.205 to 0.456	.000
Nonpain symptoms	0.074				.000
Dry mouth		0.141	0.099	−0.014 to 0.295	.074
Dizziness		−0.261	−0.119	−0.495 to 0.026	.029
Urethral catheter		0.314	0.152	0.092 to 0.536	.006
Feeling cold		0.307	0.103	−0.014 to 0.628	.061
PONV		0.465	0.143	0.115 to 0.815	.009
R^2 at last	0.158				

CI, confidence interval; PONV, postoperative nausea and vomiting.

The association between the basic characteristics, medical conditions, and symptoms was assessed with the bivariate spearman's rank correlation test. As shown in Table 6, with the increase in anesthesia duration, patients rated pain, dizziness, and somnolence lower. As the ASA classification escalates, rating of somnolence reduced.

ASSOCIATION BETWEEN THE SYMPTOMS. Pain was negatively associated with dry mouth, sore throat, urethral discomfort, and feeling cold. A significant negative association between dry mouth and sore throat was also identified (Table 7).

Discussion

The current research describes discomfort and contributing symptoms among patients in the PACU after general anesthesia. The average level of patient-reported overall discomfort was 4.90 + 2.67 on a 0 to 10 scale, which indicated a medium level discomfort. With pain as the first complaint, several symptoms other than pain, such as dry mouth and sore throat, were also frequent complaints among patients. Pain, PONV, urethral catheter-related discomfort, and dizziness were significantly associated with patient-reported overall discomfort. Sex, department, ASA score, and anesthesia duration were related characteristics of postoperative symptoms in the PACU. In addition, correlations between the symptoms were also identified.

As tissue damage is an essential part of surgical treatment, pain was considered to be unavoidable after surgery.[18] One hundred eighty-five patients (62.71%) in this study complained of pain, with 80% of them ranking pain as the most disturbing symptom. Moreover, a significant correlation between pain and overall discomfort level was observed in the regression model (P = .000). These results indicate that pain is still the greatest contributor to the overall discomfort level of postoperative patients, a finding which is consistent with the research of Easter et al.[19] On the other hand, these facts suggested that pain management is still an unsolved issue in nursing postoperative patients. The results from our study showed that pain complaints were higher in female patients than in male patients, which is consistent with a previous study from Storesund et al.[20] According to the study from Flaskerud et al,[21] the difference in social roles and cultural expectations between male and female patients may be the reason for the difference in rate of pain. Departmental differences were also documented in our study. Pain ratings in patients from the EENT Department were

Table 5. Comparison of Symptoms in Patients of Different Sex and Department (N = 295)

Z	Discomfort	Pain	Dry Mouth	Sore Throat	Urethral Discomfort	Dizziness	Somnolence	Feeling Cold	PONV
Sex	0.034	3.067*	−0.821	−0.299	−0.358	0.556	−0.320	1.569	2.040†
Department	0.882	12.179*	1.602	2.063	5.999	0.062	1.878	3.284	3.445

PONV, postoperative nausea and vomiting.
*$P < .01$.
†$P < .05$.

Table 6. Correlation of Symptoms With Age, BMI, ASA Score, and Anesthesia Duration (N = 295)

	Discomfort	Pain	Dry Mouth	Sore Throat	Urethral Discomfort	Dizziness	Somnolence	Feeling Cold	PONV
Age (y)	0.065	0.048	−0.039	−0.077	−0.034	−0.027	−0.022	0.085	0.003
BMI	−0.051	−0.005	0.006	0.067	0.022	−0.006	0.056	0.007	0.002
ASA score	−0.077	−0.092	0.013	0.085	0.055	−0.025	−0.127*	−0.024	−0.064
Anesthesia duration (min)	−0.105	−0.125*	0.024	0.032	−0.01	−0.144*	−0.137*	0.048	0.019

ASA, American Society of Anesthesiologists; BMI, body mass index; PONV, postoperative nausea and vomiting.
*$P < .05$.

significantly higher than in the patients from the General Surgical Department and OBGYN Department. The difference may be because of different pain sensitivities of different body parts, but further research is still needed.

In addition to pain, 181 patients (61.36%) reported nonpain symptoms, suggesting that nonpain symptoms were also important causes of discomfort in PACU patients. Dry mouth, a symptom that the medical staff may not consider worth attending to, was the most frequently cited nonpain symptom in this study. Similarly, in another study on postoperative patients who underwent general anesthesia, dry mouth was also among the top three complaints.[22] The causes of dry mouth in postoperative patients are complicated. The use of preoperative atropine and inhaled anesthetics before surgery inhibit the secretion function of the salivary gland, and blood loss during surgery may also contribute to dry mouth. Other frequently reported nonpain symptoms were sore throat, urethral catheter, dizziness, somnolence, feeling cold, and PONV. Sore throat and urethral catheter-related symptoms were the second and third most frequently mentioned nonpain symptoms in the present study, which is consistent with the research of Zegerman et al.[9] PONV is another frequent nonpain complaint in other studies.[22,23] Analgesics that slow bowel movement and the surgical manipulation of the bowel in abdominal surgeries are important contributors to postoperative PONV.[24] Although PONV was ranked seventh overall in the present study, it contributed significantly to the overall discomfort of the patients ($\beta = 0.465$). In a study concerning the importance for patients of certain symptoms over others, PONV, along with fatigue, pain, appetite loss, and diarrhea, constituted the most important concerns of the patients, whereas dyspnea, constipation, and insomnia were considered less important.[25] This suggested that PONV is an important postoperative symptom that needs to be addressed to ensure patient comfort. In a recent study, PONV was added to the list of standardized end points in a perioperative medical initiative.[26] Interestingly, PONV was only reported by women in our research. Similarly, two other studies also reported that women tend to rate PONV higher than men.[17,22] The cause of this difference is still undetermined, but observations suggest that more attention should be paid to PONV in women in a postanesthesia setting. Movement restriction is a common complaint after surgery according to other studies on postoperative discomfort.[8] We did not receive complaints about movement restriction in this study.

Table 7. Correlation Between Common Discomfort Conditions

	Dry Mouth	Sore Throat	Urethral Discomfort	Dizziness	Somnolence	Feeling Cold	PONV
Pain	−0.226*	−0.180*	−0.142†	−0.046	0.021	−0.125†	−0.091
Dry mouth	1	−0.197*	−0.022	0.035	0.001	0.061	−0.004

PONV, postoperative nausea and vomiting.
*$P < .01$.
†$P < .05$.

We think that this is because the assessment in our research was performed within 2 hours after surgery, and the patients did not need to walk or perform other daily activities.

Regression models showed that pain and nonpain symptoms contributed 0.084 and 0.074 to the overall discomfort level, respectively. The contribution of nonpain symptoms as a whole was nearly equivalent to pain, suggesting that more concern about nonpain symptoms should be raised in the PACU. On the other hand, all the patient-reported symptoms taken together only explained 0.158 of the overall discomfort, indicating that more sources of discomfort need to be identified. In the definition of comfort, four contexts, physical, psychospiritual, sociocultural, and environmental, were involved.[2] Because only the physical source of discomfort was considered in this research, it is reasonable that only 0.158 of the overall discomfort was explained in our model, but future research involving contexts of comfort should be conducted.

In a correlation analysis of symptoms with the basic characteristics and anesthetic conditions of the patients, the results showed that the ASA classification was negatively correlated with somnolence, which has not been reported before. As patients with an ASA classification higher than 2 have systematic diseases, we assume that somnolence may have been ignored by the patients because of other symptoms that were more serious or urgent. Another interesting finding is that anesthesia duration was negatively associated with pain, dizziness, and somnolence. We postulate that the time needed for the elimination of anesthetics and the onset time of analgesics may be the main cause of this difference. A correlation analysis between the frequently reported symptoms showed that pain was negatively associated with dry mouth, sore throat, urethral discomfort, and feeling cold, which supported the assumption that pain may mask other symptoms in patients and induce under-reporting of nonpain symptoms. Dry mouth was negatively associated with sore throat; this result showed that different symptoms in the same or adjacent location might be intermasked. The negative association between symptoms also needs to be considered in the assessment.

There are several limitations in the present study. First, we investigated the symptoms and overall discomfort by directly asking the patients about their feelings. This method made it impossible to assess the patients who were unconscious or required mechanical ventilation, which may have led to bias. Second, nonparametric tests were used in data analysis, increasing the possibility of type II error. In addition, the sample was limited, and only participants from the EENT, general and OBGYN departments were included. Thus, caution should be taken in the generalization of the findings.

Conclusions

Postoperative patients in the PACU suffer medium levels of discomfort. The contribution of three symptoms—pain, PONV, and urethral catheter—to discomfort score, accounted 79.1% of all symptoms. The prevalence and contribution of nonpain symptoms as a cluster were nearly equivalent to pain, indicating that more attention should be paid to nonpain symptoms. Related characteristics and the masking effect of pain should be considered when assessing the symptoms.

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References

1. *ASPAN: Standards of Perianesthesia Nursing Practice*. Cherry Hill, NJ: ASPAN; 2000.

2. Kolcaba K. Holistic comfort: operationalizing the construct as a nurse-sensitive outcome. *Adv Nurs Sci*. 1992;15:1-10.

3. Morse J. On comfort and comforting. *Am J Nurs*. 2000;9:34-38.

4. Apfelbaum JL, Chen C, Mehta SS, Gan TJ. Postoperative pain experience: results from a national survey suggest postoperative pain continues to be undermanaged. *Anesth Analg*. 2003;97:534-540.

5. Gordon DB, Pellino TA, Miaskowski C, et al. A 10-year review of quality improvement monitoring in pain management:

recommendations for standardized outcome measures. *Pain Manage Nurs*. 2002;3:116-130.

6. Buss H, Melderis K. PACU pain management algorithm. *J Perianesth Nurs*. 2002;17:11-20.

7. Diemunsch P. Postoperative discomfort. *Ann Fr Anesth Reanim*. 1999;18:617-618.

8. Closs SJ, Briggs M. Patients' verbal descriptions of pain and discomfort following orthopaedic surgery. *Int J Nurs Stud*. 2002;39:563-572.

9. Zegerman A, Ezri T, Weinbroum AA. Postoperative discomfort (other than pain)—a neglected feature of postanesthesia patient care. *J Clin Monit Comput*. 2008;22:279-284.

10. Robleda G, Roche-Campo F, Sanchez V, Gich I, Banos JE. Postoperative discomfort after abdominal surgery: An observational study. *J Perianesth Nurs*. 2015;30:272-279.

11. Saratzis A, Soumian S, Willetts R, Rastall S, Stonelake PS. Use of multiple drains after mastectomy is associated with more patient discomfort and longer postoperative stay. *Clin Breast Cancer*. 2009;9:243-246.

12. Takata H, Matsutani T, Hagiwara N, et al. Assessment of the incidence of chronic pain and discomfort after primary inguinal hernia repair. *J Surg Res*. 2016;206:391-397.

13. Sadowski B, Rodriguez J, Symmonds R, et al. Comparison of polypropylene versus polyester mesh in the Lichtenstein hernia repair with respect to chronic pain and discomfort. *Hernia*. 2011;15:643-654.

14. Tolver MA, Strandfelt P, Rosenberg J, Bisgaard T. Female gender is a risk factor for pain, discomfort, and fatigue after laparoscopic groin hernia repair. *Hernia*. 2013;17:321-327.

15. Orikasa S, Kanbe K, Shirai S, Shintaku I, Kurosu S. Suprapubic versus transurethral bladder drainage after radical prostatectomy: impact on patient discomfort. *Int J Urol*. 2012;19:587-590.

16. Wilson L, Kolcaba K. Practical application of comfort theory in the perianesthesia setting. *J Perianesth Nurs*. 2004;19:164-173.

17. Andion O, Canellas M, Banos JE. Physical well-being in postoperative period: a survey in patients, nurses and physicians. *J Clin Nurs*. 2014;23:1421-1429.

18. Whelan CT, Jin L, Meltzer D. Pain and satisfaction with pain control in hospitalized medical patients: no such thing as low risk. *Arch Intern Med*. 2004;164:175-180.

19. Easter B, DeBoer L, Settlemyre G, Starnes C, Marlowe V, Tart RC. The impact of music on the PACU patient's perception of discomfort. *J Perianesth Nurs*. 2010;25:79-87.

20. Storesund A, Krukhaug Y, Olsen MV, Rygh LJ, Nilsen RM, Norekvål TM. Females report higher postoperative pain scores than males after ankle surgery. *Scand J Pain*. 2016;12:85-93.

21. Flaskerud JH. Pain and culture: the catastrophizing construct and measurement. *Issues Ment Health Nurs*. 2015;36:152-155.

22. Huppe M, Kemter A, Schmidtke C, Klotz KF. Postoperative complaints: gender differences in expectations, prevalence and appraisal. *Anaesthesist*. 2013;62:528-536.

23. Macario A, Weinger M, Carney S, Kim A. Which clinical anesthesia outcomes are important to avoid? The perspective of patients. *Anesth Analg*. 1999;89:652-658.

24. Habib AS, Gan TJ. Evidence-based management of postoperative nausea and vomiting: a review. *Can J Anaesth*. 2004;51:326-341.

25. Osoba D, Hsu MA, Copley-Merriman C, et al. Stated preferences of patients with cancer for health-related quality-of-life (HRQOL) domains during treatment. *Qual Life Res*. 2006;15:273-283.

26. Voncina G, Newcomb P. Effects of enhanced family visitation in postanesthesia services. *J Perianesth Nurs*. 2016;31:415-421.