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Predictors of pre- and postoperative anxiety in emergency surgery patients

A.N. Karanci*, G. Dirik

Department of Psychology, Middle East Technical University, 06531 Ankara, Turkey

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Abstract

Objective: Emergency surgery is a highly stressful life event. Patients experience distressing anxiety both before and after surgery and this anxiety affects their recovery process. The aim of the present study is to examine variables related to pre- and postoperative anxiety in emergency surgery patients. **Methods:** The sample consisted of 146 emergency surgery patients who had abdominal surgery in an emergency surgery clinic. The research instruments were administered before and after the surgery. State Anxiety Inventory (STAI-A State), Anxiety Specific to Surgery Questionnaire (ASSQ), a scale tapping fears and worries specific to surgery developed for the present study, Ways of Coping Inventory (WCI), and the Multidimensional Scale of Perceived Social Support (MSPSS) were administered. **Data analysis:** Data were analyzed by using the appropriate programs of the Statistical Package for the Social Sciences (SPSS). **Results:** There was a significant drop in anxiety from the pre- to the postoperative period. Female patients had higher preoperation anxiety than males. Females and males did not differ in anxiety at the postoperation period. Being female, waiting for primary suture for peptic ulcer perforation operation, and helplessness and self-blaming coping appeared as significant predictors of anxiety specific to surgery. Being female and awaiting for primary suture for peptic ulcer perforation were significant predictors of preoperative state anxiety. Finally, years of education were negatively and use of active coping was positively related to postoperative state anxiety. **Conclusion:** Patient sociodemographic and psychological characteristics and type of surgery need to be considered for identifying patients at risk of experiencing anxiety both before and after surgery and psychological support and clinical management needs to be tailored to the needs of the patients to alleviate their anxiety.

Keywords: Anxiety in emergency surgery; Pre- and postoperative anxiety

Introduction

Hospitalization and surgery are very important negative life events that lead to the experience of considerable anxiety in patients. This anxiety is related to being ill, the threat posed by potential surgery and the potential negative aftereffects of surgery, the role obligations of hospitalization such as being in a strange environment, having unfamiliar roommates, and the necessity to comply with medical procedures and numerous diagnostic tests [1,2]. Anxiety is particularly relevant for emergency surgery patients who by the nature of the urgent situation have very little time to adjust to the fact of having a medical problem and having to undergo surgery. High preoperative anxiety leads to physical problems like dizziness, nausea, and headaches [3]. Pre- and postoperative anxiety tends to be correlated [3–6]. Patients with high postoperative anxiety have longer hospitalization periods and report more postoperative pain [4].

Due to the distress anxiety causes for the patients and its relationship to physical well-being and recovery, it is important to identify variables related to both preoperative and postoperative anxiety in order to offer services suitable for the needs of patients who may be at greater risk for such anxiety.

Research has shown that preoperative anxiety is related to fears related to surgical failures, anesthesia, fear of loss of control, and fear of death [7,8], whereas postoperative anxiety has been found to be related to fears of pain, loss of physical functioning, potential negative effects of surgery on body image, returning to a normal daily routine, and career problems [1,7,9]. Certain sociodemographic characteristics, such as age, gender, marital status, and education have been noted to be related to anxiety experienced by patients. Women, young people, people with low education levels, and single individuals have been found to be more

* Corresponding author. Tel.: +90-312-210-3182; fax: +90-312-210-1288.

E-mail address: karanci@metu.edu.tr (A.N. Karanci).

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vulnerable to anxiety in the pre- and postoperative period [10–12]. Psychological characteristics of the patients, such as coping strategies and perceived social support have also been found to be related to pre- and postoperative anxiety. In terms of coping strategies, it has been found that emotion focused coping may be more suitable for reducing pre- and postoperative anxiety than problem focused coping for patients [3,13].

Social support literature stresses the buffering role of perceived social support against stress. Thus, it can be expected that patients who perceive a high amount of social support will experience lesser anxiety as compared to those with a low perception of social support [14].

The aim of the present study is to examine variables related to pre- and postoperative anxiety in emergency surgery patients. Based on the literature, it was expected that after controlling for illness-related and sociodemographic variables, ways of coping and perception of support will be related to both pre- and postoperative anxiety reported by the patients.

Method

Patients

The sample consisted of 146 (66 female and 80 male) emergency surgery patients who had abdominal surgery in the emergency surgery clinic of Numune Hospital in Ankara, the capital of Turkey. The following criteria were used in selecting the patients to be included in the sample: (1) age range between 18 and 65, (2) having to undergo appendectomy, cholecystectomy, and primary suture for peptic ulcer perforation, and (3) giving consent to participate in the study.

Main characteristics of the sample are presented in Table 1.

Table 1
Characteristics of the sample

Variables	Percentages (*N*)	Mean	S.D.	Range
Age		32.98	12.84	18–65
Education (in years)		7.45	3.98	0–15
Marital status				
Single	33 (48)			
Married	67 (98)			
Number of children		2.73	1.52	0–4
Hospitalized before	42 (62)			
Operated before	22 (33)			
Employed	44 (64)			
Unemployed	56 (82)			
Type of surgery				
Appendectomy	60.3 (88)			
Cholecystectomy	22.6 (33)			
Primary suture for peptic ulcer perforation	17.1 (25)			

Instruments

The research instrument contained five parts. The first part tapped sociodemographic (sex, age, education, marital status, number of children, employment status) and medical history information (previous illness and hospitalization/surgery history and type of present surgery). The second part was the Anxiety Specific to Surgery Questionnaire (ASSQ) prepared for the present study (see Appendix for the items of this scale). The questionnaire consists of 10 items prepared by the authors, on the basis of interviews with surgeons, nurses, and patients of the emergency surgery clinic about fears experienced before surgery and pilot tested with some patients for relevance and clarity of meaning. The items mainly reflected fears about pain and dying during the surgery and postsurgery complications and restrictions. The 10 items were presented with a five-point Likert response format (1 = *do not agree at all*, 5 = *completely agree*). The Cronbach's alpha for the scale was .79. The third part was the State Anxiety Scale of the State–Trait Anxiety Inventory (STAI-A State) [15]. The STAI-A State has 20 items, and it has been adopted for use in Turkish samples [16]. The patients were instructed to rate each item by considering how they feel at that moment on four-point Likert type scales (1 = *not at all*, 4 = *very much so*). The Cronbach's alpha for the preoperation administration of the STAI-A was .91 and for the postoperation it was .62. The fourth part was the Ways of Coping Inventory (WCI) [17], which has been previously used with Turkish samples [18,19]. The present study employed a slightly modified version of the WCI, which was used in a previous study to examine the relationship of coping with distress in earthquake survivors in Turkey [18]. In this study, helplessness and self-blaming coping were found to be positively related to distress levels, whereas problem solving and optimistic coping were negatively related to distress. The WCI has 42 items, rated on three-point Likert-type scales (1 = never, 2 = sometimes, 3 = always). The instructions require the respondents to consider each item and to give a rating based on how they generally cope with their troubles. The factor analysis of the WCI using principal components with varimax rotation yielded five factors, explaining 36.9% of the variance. The factors were labeled as fatalistic (Cronbach's alpha = .84), problem solving and optimistic (Cronbach's alpha = .65), helplessness and self-blaming (Cronbach's alpha = .53), active coping (Cronbach's alpha = .66), and distancing/seeking social support coping (Cronbach's alpha = .57). Finally, the last part was the Multidimensional Scale of Perceived Social Support (MSPSS) [20]. The scale measures perceived support from friends, significant others, and family members. It has been previously adopted and used with Turkish samples [21]. The items are rated on seven-point Likert-type scales (1 = *agree very strongly*, 7 = *disagree very strongly*). The Cronbach's alpha was .79 for this scale.

Procedure

The instruments were administered in the emergency surgery clinic over a 14-month period to patients admitted for abdominal surgery. Upon arrival at the clinic, the second author, who is employed as a full-time nurse in the clinic (as well as being a graduate student of clinical psychology), introduced herself, explained the purpose of the study, and obtained informed consent from patients who had a diagnosis of peptic ulcer perforation, appendicitis, and cholecystitis and who were between the ages of 18 and 65. These diagnostic groups were the most frequently presented groups in the clinic; thus, in order to restrict variations due to type of surgery, only these three groups were selected.

Study design

The instruments were administered to the patients on two occasions. The first one was the preoperation administration, which was done approximately 1–2 h before the surgery. The STAI-A State and ASSQ were given in a random order. In the emergency surgery clinic, all the patients are taken to the intensive care unit following their operations. They are returned to their emergency clinic rooms when they regain consciousness and when all major complications are dealt with. The second administration of scales, the postoperation administration, was done following their return from the intensive care unit. After settling in their rooms and the completion of necessary medical procedures, the patients were asked about their well-being and whether they feel like answering some more scales. After making sure that the patients are in a suitable state to answer the scales and after obtaining their consent, the postoperative administration was carried out (mean postoperation time in hours = 22.21, S.D. = 15.45). During this evaluation, sociodemographic and medical information forms, STAI-A State, WCI, and MSPSS were given. The scale administration was kept at a minimum before the surgery due to the physical condition of the patient and the urgency for the operation. In both administrations, the investigator gave the necessary instructions for each scale, read the items, and recorded the responses herself. The presurgery administration took about 15 min, while the postsurgery administration took about 30 min. All the patients approached gave consent for participation and interestingly expressed gratitude for being inquired about their fears. Thus, they approached the study very favorably.

Statistical analysis

Data were analyzed by using appropriate programs of the Statistical Package for the Social Sciences (SPSS) [22]. The following were used: factor analysis for WCI, Cronbach's alpha reliability analysis for the factors and scales used in the study, repeated measures ANOVA for examining gender by pre- and postsurgery differences in STAI-A, ANOVA for examining gender differences for ASSQ, and finally, multiple regression analysis programs to examine the predictors of the ASSQ and pre- and postoperation STAI-A. All significance testing took place at .05 level (two-sided).

Results

Pre- and postoperative anxiety scores

Pre- and postoperative anxiety scores were obtained by summing up the responses to the 20 items of the STAI-A State scale administered before and after the surgery. The means and standard deviations of the pre- and postoperative assessment for females and males are presented in Table 2.

A 2 (gender) by 2 (pre- and postoperation anxiety) repeated measures ANOVA on anxiety revealed a significant main effect for anxiety [$F(1,144) = 41.31$, $P < .001$], showing a decrease in anxiety from the preoperation (mean = 49.52, S.D. = 11.3) to the postoperation (mean = 42.99, S.D. = 5.9) period. The Gender × Anxiety interaction was also significant [$F(1,144) = 6.24$, $P < .01$]. Post-hoc Tukey analysis revealed that females had higher preoperative anxiety as compared to males [$F(1,145) = 7.14$, $P < .05$]. There was no significant difference between males and females in their postoperative anxiety levels [$F(1,145) = 02$, $P > .05$]. The pre- and postoperative STAI-A State scores were not significantly correlated ($r = .07$, $P > .05$).

ASSQ scores was calculated by summing up the responses to the 10 items (mean = 27.54, S.D. = 8.95, $R = 10–46$). Males and females did not differ in their ASSQ scores [$F(1,128) = .08$, $P > .05$]. The ASSQ scores were highly correlated with preoperative STAI-A State scores ($r = .58$, $P < .01$), but not with postoperative STAI-A State scores ($r = .12$, $P > .05$).

Predictors of pre- and postoperation anxiety and anxiety specific to surgery

In order to examine variables that are related to the pre- and postoperation STAI-A and ASSQ, three separate multiple regression analyses were conducted. In all of the three analyses, the same set of independent variables was used and was entered in two blocks. In the first block, sociodemographic variables (sex: female = 0, male = 1); age, years of education, marital status (married = 0, single = 1), number of children, previous hospitalization (yes = 0,

Table 2
Pre- and postoperation STAI-A State scores for males and females*

	Preoperation	Postoperation
Female	51.98[a]	42.92[b]
Male	47.05[c]	43.06[b]

* Means with different subscripts are significantly different from each other.

Table 3
Predictors of anxiety specific to surgery and pre- and postsurgery state anxiety

	ASSQ		STAI-A before		STAI-A after	
Predictors	*B*	β	*B*	β	*B*	β
Sex	−4.76	−.27*	−6.43	−.28*	1.40	.12
Age	−0.00	−.08	−0.20	−.23	−0.00	−.04
Education	0.17	.07	0.28	.10	−0.32	−.22*
Marital status	−3.28	−.17	2.35	.10	−1.55	−.12
Number of children	0.43	.07	1.45	.19	−0.13	−.03
Previous hospitalization	1.35	−.08	−1.53	−.07	1.70	.14
Previous operation	0.29	.01	1.73	.06	−0.91	−.06
Employed–unemployed	−1.09	−.06	−0.77	−.03	1.00	.09
Dummy peptic ulcer	5.34	.23*	9.30	.31*	−1.06	−.07
Dummy cholecystectomy	3.45	.15	4.83	.17	−0.66	−.05
R^2	.17		.17		.13	
R	.42		.42		.35	
$F\Delta$	2.82*		2.85*		1.93*	
Perceived social support	−0.00	−.04	−0.00	−.07	0.00	.13
Helplessness and self-blaming	0.39	.20*	0.18	.07	0.17	.14
Active coping	−0.58	−.14	−0.00	.01	0.78	.28*
Seeking social support	−0.35	−.10	−0.51	−.11	−0.00	−.00
Fatalistic coping	0.37	.16	0.53	.18	0.00	.00
Problem solving and optimistic	0.34	.08	0.24	.04	0.28	.10
R^2	.09		.04		.17	
R	.51		.46		.54	
Total R^2	.26		.21		.30	
$F\Delta$	2.47*		1.01		4.99**	
Total $F\Delta$	2.80**		2.16		3.29**	

* $P<.05$.
** $P<.01$.

no = 1), previous operation (yes = 0, no = 1), employment status (not employed = 0, employed = 1), type of current operation (as dummy variables) were entered. In the second block, perceived social support, helplessness and self-blaming, active coping, seeking social support, fatalistic coping, and problem solving and optimistic coping were entered. The results of the three-regression analysis are shown in Table 3.

Predictors of ASSQ

As can be seen from Table 3, variables in the first block explained 17% of the variance [$F(10,135)=2.82$, $P<.05$], and the second block explained 9% of the variance in ASSQ [$F(6,129)=2.47$, $P<.01$]. In the final analysis, all variables explained 26% of the variance [$F(16,145)=2.80$, $P<.001$]. Being female (sex: female = 0, male = 1), waiting for peptic ulcer perforation operation, helplessness and self-blaming coping appeared as significant predictors of ASSQ.

Predictors of preoperative STAI-A State anxiety

For STAI-A, variables in the first block explained 17% of the variance [$F(10,135)=2.85$, $P<.05$], whereas the second block explained 4% of the variance, which was not significant [$F(6,129)=1.01$, $P>.05$]. In the final analysis, all variables explained 21% of the variance [$F(16,145)=2.16$, $P<.05$]. Being female (sex: female = 0, male = 1) and awaiting for peptic ulcer perforation operation appeared as significant predictors of preoperation STAI-A.

Predictors of postoperative STAI-A State anxiety

As can be seen from Table 3, variables in the first block explained 13% of the variance [$F(10,135)=1.93$, $P<.05$], whereas the second block explained 17% of the variance [$F(16,129)=4.99$, $P<.001$]. In the final analysis, all variables explained 30% of the variance [$F(16,145)=3.29$, $P<.001$]. Years of education and active coping appeared as significant predictors of postoperation STAI-A.

Discussion

The main aim of the present study was to examine variables related to anxiety experienced by emergency surgery patients before and after their operations. Before the surgery, two different scales were used for assessing anxiety. The first one was the ASSQ, which was developed to be used in the present study. It aimed to tap specific fears and worries related to what may happen during and after surgery. The second scale was the STAI-A State, which examines the symptoms of anxiety experienced by patients at that moment.

The results showed that emergency surgery patients had considerable state anxiety before surgery. Considering that

80 is the maximum score that can be obtained from the STAI-A State, a mean approaching 50 can be regarded as moderately high. The comparison of the anxiety scores of the present sample with anxiety scores reported in previous studies, which were mainly conducted with samples of general surgery patients in Turkey shows that the present sample had higher anxiety. STAI-A State was found to be around 38 in a sample of general surgery patients before their surgery (LeCompte & Lecompte, 1981, cited in Ref. [16]), 41 before surgery, and 29 after surgery in another sample of general surgery patients [23]. Considering the fact that patients face emergency surgery suddenly without much prior preparation, it can be expected that emergency surgery is a more stressful event than general surgery and thus the results of the present study seem to be in agreement with previous results, only demonstrating higher anxiety for emergency situations. The drop in anxiety from the pre- to the postsurgery assessment supports this view. The patients seem to be in a state of relief at the postoperation assessment period, probably by seeing that the operation is over and that they are still alive. This result is in line with the findings of previous research noting a decrease in anxiety from pre- to postoperation periods [3,24]. The researchers observed that the patients were more willing to answer the research questions in the postoperative assessment and expressed their pleasure for being asked about their psychological state. The results showed that although there were no gender differences in the postoperative period, females had higher preoperative state anxiety as compared to males.

The present study failed to find a correlation between pre- and postoperative state anxiety scores, which is contradictory to the results of some previous studies [3,5,6]. This difference may be related to the timing of the postsurgery assessment. In the present study, the mean postsurgery assessment time was 22 h, whereas in the literature, the postsurgery assessments are usually conducted 1 week or later after the surgery. This difference in timing was mainly due to the conditions of the emergency clinic in which the present study was conducted. The policy of stay in the emergency clinic is short term. Following surgery, the patients are either discharged from the hospital in a short time or they are sent to the general surgery clinics. Thus, due to difficulties of follow-up, the researchers collected data quite soon after the operation. The relatively lower reliability of the postoperation STAI-A can also be related to this timing factor. This can be taken as a shortcoming of the present study and in future studies it will be fruitful to follow the patients either to their home environments or to other wards. However, it is also important to understand the anxiety of patients during their stay in the emergency clinic so that effective strategies to alleviate their anxieties during their short stay can be planned. The drop in anxiety noted in the postoperation period may be reflecting a relief period for patients and their anxiety levels may increase subsequently and may show correlations with their preoperation scores in more delayed assessments. Therefore, in future studies, a second postoperation measurement may reveal fluctuations in anxiety over time that may be valuable in guiding the timing of psychological services after surgery.

ASSQ assesses specific fears and worries related to surgery. Thus, the ASSQ can be taken as a measure of threat perception, and as proposed by the cognitive models of anxiety, threat perception is an important cognitive variable that is related to anxiety [25]. The ASSQ scores correlated significantly with the presurgery STAI-A scores, which provided support for the validity of the newly developed ASSQ. In other words, having specific fears about what may happen during and after surgery are related to the symptoms of anxiety reported by patients. The examination of variables related to ASSQ, in line with previous findings [10,26], showed that women had higher scores. This may be related to women being more anxiety prone or to reporting differences between males and females to self-report assessment devices [27]. Therefore, it may be useful in future research to use other methods of assessment as well, such as observations and reports from others in order to obtain reliable results on this gender difference. The type of operation also appeared as a significant predictor of ASSQ scores. Waiting for primary suture for peptic ulcer perforation seems to be related to higher anxiety. This can be related to patients' knowledge and expectations about peptic ulcer operations or certain personality characteristics may contribute to both the development of ulcers and vulnerability to experience anxiety. Helplessness and self-blaming coping were the only coping factors that contributed significantly to ASSQ scores. Thus, after controlling for the effects of all the sociodemographic and illness-related variables helplessness coping still contributed significantly in explaining variance in the ASSQ scores. Although, there is no single superior way of coping in the face of negative life events, adopting a helpless approach and blaming oneself seem to be ineffective in dealing with the stress of an upcoming surgery. Watson et al. [28] found that high scores on helplessness and hopelessness was related to relapse and death at 5 years in a sample of cancer patients. The self-blame component may be related to the experience of anxiety, since it may prime the patient into trying to find ways to fence off the threat posed by the surgery and thus be hypervigilant.

Similar to ASSQ scores, preoperative state anxiety was found to be related to being female and having to undergo primary suture for peptic ulcer perforation. Thus, from these results, it seems that gender is an important variable related to anxiety reported/experienced by patients before surgery. Ways of coping related only to ASSQ scores and not to preoperation state anxiety. Type of operation (primary suture for ulcer) is related to both types of preoperation anxiety measures. Thus, clinically, females and peptic ulcer patients may need special care in order to help them deal with their preoperative anxieties.

Comparing the two presurgery anxiety measures, it was found that the study variables explained more variance in

anxiety specific to surgery as compared to presurgery state anxiety. Furthermore, ways of coping and perceived social support did not contribute significantly to the explained variance in state anxiety, whereas helplessness was a significant variable for the ASSQ scores. Since the WCI taps general ways of coping, it is meaningful to note that helplessness is related to the ASSQ, which is a measure of specific threat perception and not to the perception of state anxiety symptoms. In future studies, it seems useful to examine the differential effects of these two types of anxiety for surgery- and recovery-related variables and to adopt the measure that best relates to them. Surgery-specific anxiety might be a more sensitive measure for worries and fears related to surgery [4] and thus further research with the ASSQ may prove to be valuable.

Years of education is negatively related and use of active coping was positively related to postoperative state anxiety. Education can be taken as a personal resource. The finding shows that with more education, patients experience less anxiety immediately after surgery. This can be related to their better grasp of their medical condition and the procedures applied. In the prediction of postoperation state anxiety, coping appeared as an important predictor even after controlling for the effects of sociodemographic and illness-related variables. Compared to the contribution of ways of coping to preoperation anxiety measures, it was seen that coping variables explained a greater percentage of variance for postsurgery anxiety as compared to presurgery anxiety. In the postsurgery period, when the patients are still hospitalized, the general tendency to use active coping does not seem to be suitable. In the postsurgery hospital environment, the patients are expected to rest and comply with medical care. Therefore, those employing active coping may find it difficult to exercise control and thus experience anxiety. Thus, in the clinical management of these patients, it may be valuable to offer them ways to get actively involved in their own recovery process, which may give them a sense of control that may match their active coping styles.

The present results seem to point out that certain types of coping are related to anxiety reported by the patients. However, for the pre- and postsurgery periods, different coping strategies are detrimental. Helplessness and self-blaming increase anxiety specific to surgery, whereas active problem solving increases postsurgery state anxiety. However, we need to be cautious in interpreting these results. Although, the present study instructed the patients to rate how they generally cope with troubles in their lives, we need to keep in mind that their anxiety might have affected the way they responded to the coping inventory. Future longitudinal studies assessing coping specific to troubles related to surgery and assessments of various affective reactions, such as anxiety and depression may bring about valuable information on the relationship between coping and affective reactions. Furthermore, the present study did not examine surgery and recovery variables that may be related to anxiety, such as complications, duration of hospital stay, and reported pain. It will be fruitful to examine this relationship in future studies. Contrary to some previous studies [10,12], the present study did not show that younger patients experience more anxiety. This lack of relationship between age and anxiety may be related to the emergency surgery conditions of the present study. Future studies comparing emergency surgery with general surgery patients may give valuable information on why emergency situations suppress the previously noted age differences in anxiety.

Perceptions of social support did not appear to be significant for either the pre- or the postoperation anxiety score. This may be related to the timing of assessments and the emergency nature of the operation, which may not provide adequate time for the social support effects to show themselves.

Conclusions

The present results pointed out that females experience more preoperative anxiety. Therefore, it is important to understand this gender effect and find effective ways to reduce it. Giving knowledge about surgery and its favorable consequences may be effective in reducing their worries. Coping strategies seem to be related to both pre- and postoperative anxiety, although they seem to be more important for postsurgery anxiety. Active coping is related to postoperative anxiety, whereas helplessness and self-blaming anxiety are related to preoperative surgery-specific anxiety. Therefore, patients' characteristic ways of coping may need to be considered in planning for clinical management procedures. Those using helplessness and self-blaming coping can give information about the causes of their present condition to reduce unnecessary self-blame before the surgery, whereas those using active coping may benefit from being given some active role in their own management. Peptic ulcer patients seem to be especially vulnerable to preoperation anxiety. The effects of various psychological strategies matching the needs of anxiety-vulnerable patients need to be investigated in future studies in order to provide more suitable services that will enhance the recovery process and reduce the distress levels of emergency surgery patients.

Appendix. Anxiety Specific to Surgery Questionnaire

1. Thoughts of dying frequently come to my mind.
2. If something happens to me, my family and children will remain helpless.
3. I am afraid that I may not regain my consciousness after the operation.
4. I worry that I may die during the operation due to bleeding or other reasons.

5. I worry that I may not recover completely after the operation due to inflammation or other problems.
6. I am afraid that after the operation, I may not be able to walk again and/or I may not be able to care for myself as before.
7. I worry that I will have a lot of pain after the operation I will.
8. I believe that I will get rid of all my pains and problems after the operation.
9. I am afraid that I will be physically disabled by the operation.
10. I think I will feel pain during the operation.

References

[1] Duits AA, Duivenvoorden HJ, Boeke S, Taam MA, Mochtar B, Krauss XH, Passchier J, Erdman RAM. A structural modeling analysis of anxiety and depression in patients undergoing coronary artery bypass graft surgery: a model generating approach. J Psychosom Res 1999;46:187–200.

[2] Taylor SE. Health psychology. New York: McGraw-Hill, 1995.

[3] Groot KI, Boeke S, Van den Berg HJ, Duivenvoorden HJ, Bonke B, Passchier J. The influence of psychological variables on postoperative anxiety and physical complaints in patients undergoing lumbar surgery. Pain 1997;69:19–25.

[4] Boeke S, Duivenvoorden HJ, Verhage F, Zwaveling A. Prediction of postoperative pain and duration of hospitalization using two anxiety measures. Pain 1991;45:293–7.

[5] Taenzer P, Melzack R, Jeans ME. Influence of psychological factors on postoperative pain, mood and analgesic requirements. Pain 1986; 24:331–42.

[6] Manyande A, Salmon P. Recovery from minor abdominal surgery: a preliminary attempt to separate anxiety and coping. Br J Clin Psychol 1992;31:227–37.

[7] Brown S. Quantitative measurement of anxiety in-patients undergoing surgery for renal calculus disease. J Adv Nurs 1990;15:962–70.

[8] Clarke DM, Russell PA, Polglase AL, McKenzie P. Psychiatric disturbance and acute stress responses in surgical patients. Aust N Z J Surg 1997;67:115–8.

[9] Kincey J. Surgery. In: Broome AK, editor. Health psychology: process and applications. London: Chapman & Hall, 1989. pp. 460–75.

[10] Jelicic M, Bonke B. Preoperative anxiety and motives for surgery. Psychol Rep 1991;68:849–50.

[11] Mackenzie JW. Day case anesthesia and anxiety. Anesthesia 1989; 44:437–40.

[12] Wells JK, Howard GS, Nowlin WF, Vargas MJ. Presurgical anxiety and post surgical pain adjustment: effects of a stress inoculation procedure. J Consult Clin Psychol 1986;54:831–5.

[13] Watts S, Brooks A. Patients' perceptions of the preoperative information they need about events they may experience in the intensive care unit. J Adv Nurs 1997;26:85–92.

[14] Elizur Y, Hirsh E. Psychological adjustment and mental health two months after coronary artery bypass surgery: a multisystemic analysis of patients' resources. J Behav Med 1999;22(2):157–77.

[15] Spielberger CD, Sydeman JJ. State, trait anxiety inventory and state–trait anxiety expression inventory. In: Marvish ME, editor. The use of psychological testing for treatment planing and outcome assessment. Hove (NJ): Erlbaum, 1994. pp. 292–301.

[16] Öner N, Le Compte A. Durumluk–Sürekli Kaygı Envanteri El kitabı (Handbook of State–Trait Anxiety Inventory). İstanbul: Boğaziçi Üniversitesi, 1985.

[17] Folkman S, Lazarus RS. Manual for the ways of coping questionnaire. Palo Alto (CA): Consulting Psychologist Press, 1988.

[18] Karanci NA, Alkan N, Akşit B, Sucuoglu H, Balta E. Sex differences in psychological distress, coping, social support and related variables following the 1995 Dinar (Turkey) earthquake. North Am J Psychol 1991;1(2):189–204.

[19] Uçman P. Ülkemizde çalışan kadınlarda stresle başa çıkma ve psikolojik rahatsızlıklar (Coping with stress among employed women in our country). Psikol Derg 1990;7:58–75.

[20] Zimet GD, Dahlen NW, Zimet SG, Forley GK. The Multidimensional Scale of Perceived Social Support. J Pers Assess 1988;52: 30–45.

[21] Eker D, Arkar H. Çok boyutlu algılanan sosyal destek ölçeğinin faktör yapısı, geçerlilik ve güvenilirliği (The factorial structure, reliability and validity of the multidimensional social support scale). Türk Psikol Derg 1995;34:45–55.

[22] Green SB, Salkind NJ, Akey TM. Using SPSS for Windows. New Jersey (NJ): Prentice-Hall, 1997.

[23] Kumral A. Durumluk–sürekli anksiyete, postoperative ağrı ve hemşirelik etkileşiminin ilişkileri (Trait–state anxiety, postoperative pain and interactions with nurses). Unpublished doctoral dissertation, Ege Universitesi Tıp Fakültesi, İzmir, 1979.

[24] O'Hara MW, Ghoneim MM, Hinrichs JV, Mehta MP, Wright EJ. Psychological consequences of surgery. Psychosom Med 1989;51: 356–70.

[25] Beck AT, Emery G, Greenberg RL. Anxiety disorders and phobias: a cognitive perspective. New York: Basic Books, 1985.

[26] Badner NH, Nielson WR, Munk S, Kwiatkowska C, Gelb A. Preoperative anxiety: detection and contributing factors. Can J Anaesth 1990;37(4):444–7.

[27] Joiner TE, Schmidt NB, Lerew DR, Cook JH, Gençöz T, Gençöz F. Differential roles of depressive and anxious symptoms and gender in defensiveness. J Personal Asses 2000;75:200–11.

[28] Watson M, Haviland JS, Greer S, Davidson J, Bliss JM. Influence of psychological response on survival in breast cancer: a population-based cohort study. Lancet 1999;354:1331–7.