



THE EFFECT OF PREOPERATIVE EDUCATION ON ANXIETY LEVELS AND QUALITY OF LIFE OF PATIENTS UNDERGOING ELECTIVE SURGERY

Surgery

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ABSTRACT

Introduction: Preoperative anxiety is a common attitude in patients scheduled to undergo surgery and represents with psychological and physical disturbances affecting postoperative recovery and quality of life (QoL).

Objective: The aim of this study was to identify the effect of preoperative education on preoperative and postoperative anxiety and postoperative QoL in patients scheduled to undergo laparoscopic cholecystectomy (LC) and inguinal hernia (IH) repair, without prior surgical experience.

Methods: Patients scheduled to undergo LC and IH repair were randomly assigned to control group (CG) and to interventional group (IG). The 'State-Trait Anxiety Inventory for Adults' questionnaire was used to validate anxiety before surgery and after 3 months postoperatively. The 36-item Medical Outcomes Short Form Health Survey (SF-36) was used to investigate mental, physical and emotional domains of QoL. The CG was received only routine information by doctors. The IG received additionally oral information plus a booklet from an experienced surgical nurse. Data analyzed using paired and unpaired t-test and Anova tests. The level of statistical significance was set at $\leq 5\%$.

Results: Four hundred and fifty patients were scheduled to undergo either LC or IH repair, with 200 assigned to the IG and 250 to the CG. Age, sex, marital status and educational level were similar in both groups. Postoperative State anxiety was significantly lower in IG ($p < 0.001$). Patients of the IG showed greater improvement in all of the SF-36 scale domains, specifically in physical functionality ($p < 0.001$), physical role ($p < 0.001$), physical pain ($p < 0.001$), general health ($p < 0.001$), vitality ($p < 0.001$), social functionality ($p < 0.001$), emotional role ($p < 0.001$) and mental health ($p < 0.001$). There was not mortality or significant morbidity in both groups.

Conclusion: Preoperative education by an experienced nurse with oral and written information improves perioperative state anxiety and QoL. This method could be used for all surgical patients, irrespective for the surgical procedure.

KEYWORDS

preoperative patient education, preoperative anxiety, quality of life, general surgery

INTRODUCTION

Preoperative anxiety (PA) is a frequent feeling for most patients who are scheduled to undergo a surgical procedure (Wilson et al., 2015). It has been estimated that up to 80% of them may suffer from anxiety negatively influencing recovery (Stamenkovic et al., 2018). Negative thoughts are usually emerged as the surgical procedure is planned, increase to the greatest on admission to the hospital (McCleane & Copper, 1990) and include mainly fears of surgery and general anesthesia (Egbert et al., 1963), the fear of unknown, the possibility of being ill and the risk of death (Kindler et al., 2000). Furthermore, previous studies have noticed that PA increases anesthetic demands, postoperative analgesics and can delay recovery (Matthias et al., 2012). Additional risk factors include: female sex, pre-existing psychiatric disorders, cancer disorders, previous surgery and advanced educational level (Caumo et al., 2001).

Health-related quality of life (QoL) play a crucial role on the outcomes of surgical patients (Velanovich, 2001). According to the World Health Organization, QoL is defined as "an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns" (The WHOQoL, 1994).

Surgery for various reasons may have a positive or negative impact on QoL. For example, studies in women with breast cancer, have shown a compromised QoL (Enien et al., 2018). On the opposite, surgery in cases of Crohn's disease may improve the level of QoL (Casellas et al., 2000).

Literature Review

PA is defined as the undesirable state of restlessness or tension secondary to a patient being concerned about a disease, hospitalization, surgery or the unknown (Ramsey, 1972). It is distinguished in two types, the state and trait anxiety. State anxiety characterizes a temporary and unwanted feelings of nervousness or worry of a possible hazard, whereas trait anxiety characterizes the susceptibility of an individual toward feeling anxiety (Spielberger, 1966).

There are several psychometric tools to assess and measure PA (Bjelland et al., 2002; Cao et al., 2017; Davey et al., 2007; Hornblow et al., 1976; Kain et al., 1997; Moerman & Kidson, 1996; Spielberger, 1983). Although these tests were not initially evolved for the assessment of PA, they adopted by clinical physicians as they have demonstrated to be appropriate for the evaluation of PA (Stamenkovic et al., 2018). Among the above-mentioned tools, the State-Trait anxiety Inventory-STAI (Spielberger et al., 1983) represents the traditional "gold standard" for the evaluation of PA (Facco et al., 2013).

In daily clinical practice, there is a need for specific and reproducible tools for measurements of QoL after surgery (Urbach, 2005). Precise assessment of QoL of a patient after a treatment is crucial to know the effectiveness of treatments after intervention (Diez-Cañamero et al., 2020). The two important properties of QoL measurement are validity and reliability (Urbach, 2005). In the absence of these two decisive elements, the assessment of QoL it should not be used. The most used assessment tools of QoL include the Beck Depression Inventory (BDI), the Sickness Impact Profile (SIP), and the 36-item Short Form

Health Survey (SF- 36) (Diez-Cañamero et al., 2020). These tools, cover a wide range of conditions of life that can be adversely affected by ill health, such as physical functioning, emotional well-being, and ability to undertake work and social activities (Kaplan & Ries ,2007; Lam, 2010). In most studies the SF-36-item, evaluation of QoL is used.

Preoperative education for relief of PA traditionally is performed in the preoperative visit and refers to any education that focus on improvements of patient's information, health care, and outcome (Boor, 1978; Hayward J, 1975; Osholdi ,2007). However, the results from the literature are contradicted. For example, some studies have shown that patients appreciate to be informed about surgery and postoperative sequelae (Manani et al., 2010) while other didn't show any benefit (Erkilic et al., 2017).

Nurses and other health professional usually are responsible to bridging the gap between patients' perspectives and health care providers (Sjöling et al. ,2003; Tou et al. ,2013). Strategies to overcome PA include written information (Oldman et al, 2004), verbal information and/or multidisciplinary standardized information (Giraude-Le Quintrec et al. , 2003), teaching lessons (Santavirta et al. ,1994), psychological preparation including information, cognitive behavioral therapy and hypnosis (Powel et al., 2016), music therapy and acupuncture (Bradt et al, 2013, Attias et al, 2016, pharmacological therapy (Mistrwijk et al., 2013), personal experience with collaboration of the surgical team (Stamencovic et al., 2018), and video-cartoon animation (Tou et al., 2013). All in all, through this review, sufficient evidence has been established to reinforce the validity of preoperative patient education in the improvement of PA.

The aim of this study was to evaluate the effectiveness of an educational preoperative intervention on preoperative and postoperative anxiety and pre- and post-surgical QoL by preparing the patient for self-monitoring, implementing realistic objectives and expectations and encouraging active participation in the therapeutic processes.

Methods And Study Design

Sample Inclusion And Exclusion Criteria

The study sample was drawn from patients scheduled to undergo cholecystectomy and inguinal hernia repair at the University General Hospital "ATTIKON" of Athens over the period from 15/01/2015 to 30/01/2018. Patients were included in the study if they met the following criteria: they had not any surgical experience in the past, they could understand and speak the Greek language, they had been informed of the objective of the study, they had given their written consent form, they had not mental problems, and they had no hearing impairment. Patients without one or more of the above-mentioned criteria were excluded from the study.

Study Design

The patients were randomly divided into two groups according to the last number of their health records. The patients whose last number in the register ended in an odd digit formed the control group (CG) and those whose number ended in an even digit formed the intervention group (IG). Data from the study were collected by completing the SF-36 Health Overview scale and the State-Trait Anxiety Inventory for Adults questionnaire by Ch. Spielberger, following an interview between the researcher and the participant. After completing the SF-36 Health Overview scale and the 'State-Trait Anxiety Inventory for Adults' questionnaire, each patient in the IG received oral information and training on the intervention from an experienced surgical nurse, along with an informative leaflet to study.

Data Collection Tools

The SF-36 Health Overview scale (Short Form-36 Health Survey) was used to assess the patients' quality of life (QoL). The 36 questions from the SF-36 are classified into eight thematic scales of measurement (health dimensions), consisting of 2-10 questions each, representing the most frequently measured health dimensions in the most famous measuring instruments. In turn, these are summarized in two more general scales (Summary of Physical Health Components and Summary of Mental Health Components) that allow for the simultaneous measurement and assessment of physical and mental health levels (Ware & Serbourne, 1992).

The State anxiety (STAI-S) and Trait anxiety (STAI-T) were assessed by using the Greek version of the State-Trait Anxiety Inventory Scale Form Y questionnaire (Fountoulakis et al., 2001). It has the potential to distinguish the difference between transient/instantaneous anxiety

(state anxiety) and permanent and more general anxiety (trait anxiety). The STAI consists of 40 items, 20 items allocated to each of S-Anxiety and T-Anxiety categories (Spielberger, 1983). Responses of the S-anxiety scale evaluate the intensity of the current feelings. Responses for the T-anxiety scale evaluate the frequency feelings "in general". In the STAY (Y-1), ten statements denote anxiety (item number 3,4,6,7,9,12,13,14,17 and 18) and the remaining 10 statements (1,2,5,8,10, 11,15,16,19 and 20) represent the relaxed and pleasant state of the patient. STAI scores <40 indicate minimal anxiety while >40 score indicates severe anxiety (Spielberg et al., 1999).

Intervention

A leaflet containing information related to the patient's scheduled surgery, the causes and symptoms of the disease, types of tests performed and the postoperative course was given in patients of IG. Preoperative training provided information on preoperative testing and preparation. The period and procedure of hospitalization were analyzed. Information was also provided concerning anesthesia, and the duration and risks of the operation.

Information on possible postoperative complications was provided as well as instructions for both the period of pre- and post-hospital discharge and the smooth return to normal daily life. Clear instructions were provided for healthy dietary interventions, physical activity, postoperative signs and symptoms which they should report, as well as the time to obtain medical follow up. The average time for patient training was half an hour. Finally, there was a small ten-minute discussion with each patient during which they were asked to describe their feelings on the training and whether and to what extent they found it helpful.

The CG received no other information more than what they already knew or had been received from their doctor. Three months later, the same patients completed the above tools again following a telephone interview with the researcher.

Statistical Analysis

For the demographic characteristics of the patients, mean.

For the comparison of the mean values between the two measurements the paired t-test was used, whereas the comparison of the mean values between the demographic/clinical characteristics was performed using the parametric t-test and ANOVA test.

Analysis was performed using IBM SPSS-20. The level of statistical significance was set at $\alpha \leq 5\%$. The reliability of internal relevance (Cronbach's α index) was greater than 0.70 for all dimensions of both questionnaires.

Ethical Issues

The study was carried out following the implementation of the research protocol by the Scientific Council of the University General Hospital "ATTIKON". The principles of the Helsinki Declaration were followed throughout the study. Patients were informed of the objective of the study and the way the data would be collected, both in writing and verbally, and gave their consent accordingly. Participation was voluntary and patients were allowed to leave at any stage of the study.

RESULTS

Description Of Study Population

The study sample consisted of 450 patients undergoing cholecystectomy or inguinal hernia repair (55.6% and 44.4% respectively), 200 of whom constituted the IG and 250 the CG (Figure 1).

No statistical differences were found regarding sex (M/F: CG/IG: 287/163, $p = 0.317$), mean age (CG: 53.835 ± 12.1 , IG: 55.21 ± 13.8 , $p = 0.272$), distribution of surgical lesions (inguinal hernia, CG/IG, $p = 0.5$, cholecystectomy, CG/IG, $p = 0.317$, respectively), marital status (CG/IG, $p = 0.199$) and educational level (CG/IG, $p = 0.593$) between groups (Table 1).

The mean values of STAI-S and STAI-T scores for CG and IG are shown in Table 2. The mean STAI-T anxiety levels measured the day before surgery and 3 months later between groups didn't reveal statistically differences (44.56.53 vs 44.416.81, respectively, $p = 0.723$, and 40.12 3.12 vs 39.893.80 respectively, $p = 0.072$). It is interesting to note that the STAI-S levels of IG was statistically lower compared to CG (29.323.72 vs 45.185.41 respectively, $p < 0.001$).

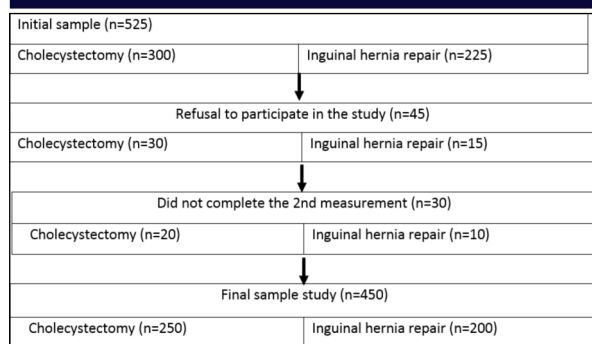


Figure 1. Study Flow Chart

Table 3 shows the details of preoperative and postoperative SF-36 scores of the patients of the two groups. Before surgery, besides the statistical differences in the subscale “physical pain” of SF-36 score between CG and IG (47.793.92 vs 47.964.12 respectively, $p=0.001$), there were not statistically different regarding the rest domains (physical functionality: 71.046.07 vs 68.337.47 respectively, $p=0.528$, physical role: 57.064.97 vs 56.834.65 respectively, $p=0.081$, general health: 54.634.04 vs 55.053.52 respectively, $p=0.057$, vitality: 59.806.26 vs 59.585.93 respectively, $p=0.178$, social functionality: 62.876.28 vs 63.355.43 respectively, $p=0.178$, emotional role: 68.346.33 vs 67.836.83 respectively, $p=0.191$, and general health: 48.335.00 vs 48.234.50 respectively, $p=0.739$). However, at 3 months postoperatively, a statistically difference between CG and IG in all subscales of the SF-36 score was seen (physical functionality: 60.728.8 vs 94.817.2, respectively $p<0.001$, physical role: 55.942.8 vs 90.529.4, respectively, $p<0.001$, physical pain: 58.029.3 vs 91.9, respectively, $p<0.001$, general health: 57.710.3 vs 62.65.5, respectively, $p<0.001$, vitality: 45.010.1 vs 49.58.0, respectively, $p<0.001$, social functionality: 71.325.2 vs 93.215.2, $p<0.001$, emotional role: 72.238.7 vs 90.529.4, $p<0.001$, mental health: 60.38.6 vs 68.13.7, $p<0.001$) (Table 3).

DISCUSSION

This randomized prospective study examined the impact of a preoperative educational program on perioperative anxiety and QoL in patients undergoing elective IH or cholecystectomy. We showed that informed patients by an experienced nurse one day before surgery reported statistically reduced state anxiety and 3 months postoperatively when compared with patients received routine medical information. Moreover, the SF-36 tool of health QoL measurement was found to be improved at 3-month follow-up in patients of IG compared with CG.

An essential element of preoperative preparation is educating patients about the surgical procedure, in order to empower them to surpass better any negative physical, emotional and mental feelings. Although the role of a nurse is different from the surgeon, it has been showed that health care professionals do not concentrate usually to the personal demands of the patients. Reasons for that include the excessive work and the limited time (Ayaz et al., 2020). A substantial number of studies (Guo et al., 2012; Guzelhan et al., 2020; Kalogianni et al., 2016; Oteri et al., 2021; Zhang et al., 2012) suggest that preoperative education delivered by nurses reduces anxiety, postoperative complications, hospital stay, improves recovery, and decreases physical disability. For instance, Guo et al. (2012) found that the participants in the preoperative education program among cardiac surgery patients had significantly less depression scores than control group (baseline adjusted mean difference -2.1-3.19 to -0.92, $p<0.001$). In addition, Zhang et al. (2012) investigated the impact of nurse-initiated preoperative education on postoperative anxiety symptoms and complications after coronary artery bypass grafting. They found that patients who completed a structured education and counseling course supervised by nurse on the day of admission and 3 days after surgery, had less anxiety and complications rates (lower extremity edema, respiratory infection, deep venous thrombosis and urinary retention) than the control group (40.1 [SD, 6.5] versus 48.9 [SD, 7.3], $p=0.01$). Similarly in our study with the use of a nurse-led protocol, postoperative state anxiety of IG patients was significantly lower than CG ($p<0.001$). On the contrary, a review study (Gurusamy et al., 2014) of patients randomly assigned to receive elective cholecystectomy, compared the harms and benefits of formal patient education for patients scheduled to undergo elective laparoscopic cholecystectomy.

The authors reported that the effects of formal patient education compared with standard care were uncertain.

Improved QoL has become one of the most critical concerns in a spectrum of surgical approaches (Peker et al., 2020; Sasajima et al., 2020; Wilson et al., 2012). For instance, several studies related to femoral fractures (Peeters et al., 2016; Siggeirsdottir et al., 2005; Sprague et al., 2018) examined the impact of preoperative education on postoperative activities of daily living and QoL. They found decreased length of hospital stay and increased QoL scores. In the present study, all the domains of SF-36 questionnaire were significantly improved at 3 months in patients participating in the IG ($p<0.001$).

Strengths And Limitations

Strengths of this study include the prospective randomization of the patients, the relatively large sample size, and the homogeneity of population regarding age, gender, health status and educational level. The subjects underwent common surgical procedures which usually accompanied with short-term hospitalization and low rates of postoperative morbidities. Indeed, the fact that all patients had no previously experience of surgery, support the reliability of our findings.

The method of the sample collection is a limitation of the study. The sample was collected using the easy sampling method since it concerned mid-gravity and low-risk surgery. In addition, the questionnaires were completed prior to the surgery using a face-to-face interview or were completed by the patients themselves, whereas after surgery they were completed by a telephone interview. It is not clear whether the results can be generalized in other patient populations. It has not been possible to provide information related to the educational level of the participants. To the extent that this is the case, we may have underestimated the size of unfulfilled information needs.

Implications For Practice

Our results provide accurate evidence of the positive effect of preoperative patient education. Nurse-initiated preoperative education and counseling one day before elective surgery is accompanied with reduced state anxiety and better QoL.

CONCLUSIONS

The value of information helps to reduce anxiety, develop a relationship of trust between patients and caregivers. In addition, the benefits of providing a high level of information to patients contribute to reducing complaints, increasing the satisfaction of healthcare workers and facilitating patient compliance with both the therapeutic guidelines and hospital regulations. The distribution leaflets relevant to the surgery play an important role. Patient educational training should not be considered to be of secondary importance. On the contrary, it should be included in day-to-day nursing and medical practice. Nurses and doctors can handle such conditions by assuming the role of the patient's instructor, eliciting the patient's fears and concerns in order to reduce anxiety and other negative emotions during their treatment. These interventions lead to better management of patient care and treatment.

Table 1. Demographic Characteristics Of The Patients

	Overall (n=450)	Control group (n=250)	Intervention group (n=200)	p value
Gender				
-Male	287	133	154	0.317
-Female	163	117	46	
Age (mean ±SD)	54.2±13.2	53.835±12.1	55.21±13.8	0.272
Disease				
Inguinal hernia (%)	200 (44.4)	108 (54)	92 (46)	0.5
Cholelithiasis (%)	250 (55.6)	122 (48.8)	128 (51.2)	
Marital status				
Married (%)	391(86.9)	220(88)	171(85.5)	0.199
Single (%)	38(8.4)	23(9.2)	15(7.5)	
Widower (%)	21(4.7)	7 (2.8)	14(7)	
Education level				
Elementary (%)	156(34.7)	98(39.2)	58(29)	0.593
High school (%)	188(41.8)	103(41.2)	85(42.5)	
Graduate (%)	106(23.5)	49(19.6)	57(28.5)	

Table 2. Comparison Of Means $\pm$ SD Of STAI Scale Between Control Group And Intervention Group Before Surgery And Three Months Later

Variables	Control group (n:250)	Intervention group (n:200)	p value	Control group (n:250)	Intervention group (n:200)	p value
	Day before surgery			3 months post-discharge		
STAI-T	49.336.62	42.265.85	<0.001	40.193.40	39.893.80	0.072
STAI-S	44.56.53	44.416.81	0.723	45.185.41	29.383.72	<0.001

Table 3. Changes In SF-36 Scale For The T2o Study Groups Before Surgery And After 3 Months

Variables	Day before operation			At 3 months post-discharge		
	Control group (n:250)	Intervention group (n:200)	p	Control group (n:250)	Intervention group (n:200)	p
Physical function ability	71.046.07	68.337.47	0.528	60.728.8	94.817.2	<0.001
Physical Role	57.064.97	56.834.65	0.081	55.942.8	90.529.4	<0.001
Physical Pain	47.793.92	47.964.12	0.000	58.029.3	91.915.6	<0.001
General health	54.634.04	55.053.52	0.057	57.754.193	60.611.4	<0.001
Vitality	59.806.26	59.585.93	0.178	45.010.1	49.58.0	<0.001
Social Function ability	62.876.28	63.355.43	0.178	71.325.2	93.215.2	<0.001
Emotional Role	68.346.33	67.836.83	0.191	72.238.7	90.529.4	<0.001
Mental health	48.335.00	48.234.50	0.739	60.38.6	683.7	<0.001

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