

# Preoperative anxiety in ambulatory surgery: The impact of an empathic patient-centered approach on psychological and clinical outcomes



Lígia Pereira<sup>a,b,\*</sup>, Margarida Figueiredo-Braga<sup>b,1</sup>, Irene P. Carvalho<sup>b,1</sup>

<sup>a</sup> Ambulatory Surgery Unit, Centro Hospitalar do Porto, Porto, Portugal

<sup>b</sup> Department of Clinical Neurosciences and Mental Health, School of Medicine, Oporto University, Porto, Portugal

## ARTICLE INFO

### Article history:

Received 26 August 2014

Received in revised form 14 October 2015

Accepted 18 November 2015

### Keywords:

Preoperative anxiety

Ambulatory surgery

Empathic patient-centered approach

Surgical outcomes

Surgical wound healing

## ABSTRACT

**Objective:** This study aims to evaluate the influence of an empathic patient-centered approach on preoperative anxiety and surgical outcomes in ambulatory surgery patients.

**Methods:** A sample of 104 patients undergoing general ambulatory surgery was randomly assigned to the intervention (IG) and the control (CG) groups. Before surgery, the IG received personalized information through an empathic patient-centered interview. The CG received standardized information on surgical procedures. Anxiety was assessed before and after the preoperative interview and after the surgery. Wound healing, post-surgical recovery and satisfaction with the quality of preoperative information were assessed after the surgery.

**Results:** The two groups were identical at baseline regarding anxiety, socio-demographic and clinical characteristics. After the patient-centered intervention, the IG showed lower levels of preoperative anxiety ( $p < 0.001$ ) and pain ( $p < 0.001$ ), better surgery recovery ( $p < 0.01$ ) and higher levels of daily activity ( $p < 0.001$ ) and of satisfaction with the information received ( $p < 0.01$ ) than the CG. The IG also showed better wound healing (tissue type,  $p < 0.01$ ; local pain,  $p < 0.01$ ).

**Conclusion:** An empathic patient-centered intervention can reduce preoperative anxiety and increase surgical recovery, wound healing and patient satisfaction.

**Practice implications:** This approach is applicable in pre-surgical interviews and can potentially be used in the routine care of various surgical contexts.

© 2015 Elsevier Ireland Ltd. All rights reserved.

## 1. Introduction

An increasing number of surgical procedures are presently performed in ambulatory surgery, representing 75% of the annual scheduled surgeries. Ambulatory surgery represents a more comfortable and less expensive alternative to conventional surgery, since it can minimize the impact of hospitalization and contribute to patients' early recovery [1,2]. Ambulatory surgery reduces waiting surgical lists, involves the patient and his or her family, and provides an individualized and humanized care, promoting faster postoperative recovery and socio-professional rehabilitation [3]. Despite these advantages and today's technical improvements and increased quality of medical interventions, ambulatory surgery may represent a disturbing moment,

triggering anxiety in patients and their families, not only because of the intervention itself, but also because of fear of the unknown [1–4]. Even if the surgery is minor (requiring only one-day recovery in the hospital), raised anxiety levels are evident and may impact outcomes, which warrants research.

Anxiety is a human response to situations of threat, a psychological reaction to stress factors, with psychological and physiological components. Surgery tends to raise anxiety levels regardless the type of operation. About 80% of adult patients submitting to a surgery report anxiety caused by anticipation of pain, separation from family, loss of independence, fear of surgical procedures and of the anesthesia, the possibility of changes in body image and of death [5,6].

High levels of anxiety have been shown to adversely influence surgical procedures and to be a contributing factor in surgical outcomes [7–10]. Studies addressing the relationship between immune responses and psychological states in inpatient care showed that preoperative anxiety is associated with a slower, more complicated and more painful postoperative recovery [9–12].

\* Corresponding author at: Department of Clinical Neurosciences and Mental Health, School of Medicine, Oporto University, Porto, Portugal.

E-mail address: [ligiaper@gmail.com](mailto:ligiaper@gmail.com) (L. Pereira).

<sup>1</sup> These authors contributed equally to this work.

Frequently analyzed outcomes were patients' anxiety, knowledge of what a patient retains from education, satisfaction with the procedure, pain and length of hospital stay. However, retention of patient knowledge from preoperative education and satisfaction were the only positive outcomes influenced by inpatient and outpatient standardized education when no specific communication strategies were applied [7]. In studies performed in ambulatory surgery, some patients reported feeling that nurses were not open to their concerns and a sense of abandonment during the preoperative period [5,6]. Others showed that patients' most common complaints regarding nurses' intervention were insufficient information, inadequate respect and insufficient empathy [13–16].

Many strategies for reducing anxiety have been used in both inpatient and outpatient settings, but only a few have proven successful [5,13–28]. The most effective interventions from the current literature are preoperative interventions using empathy and patient-centered approaches. Though empathy is a complex concept lacking a consensual definition, in clinical practice empathic communication has been viewed as the appreciation of the patient's emotions and expression of that awareness to the patient, leading to the latter feeling understood, respected and validated [29,30]. The patient-centered model includes exploration of the patient's main reason for the visit, concerns, expectations and need for information, emotional needs and life issues, integrating the understanding of the whole person (the patient's world) with the understanding of the disease [31,32]. The objectives of empathic patient-centered approaches are to encourage patients to express their feelings and to provide psychological support and tailored information. Successful interventions also aim to answer patients' questions in a calm, supportive and confident manner within an atmosphere of privacy, care and concern, with a nonjudgmental and respectful attitude [19–23,29–32].

These strategies have reduced the preoperative anxiety of patients in inpatient care. Interventions focused on the evaluation of individual anxiety precipitating factors, and tailored information addressing patients' needs have been associated with a better recovery including lesser need for sedatives and fewer medical and psychological complications [19–23]. Delivery of routine standardized instructions about the surgical procedures helps patients to obtain adequate information and knowledge about the surgical preparation protocol and the surgery. However empathic, patient-centered approaches have been more effective in reducing anxiety levels [5,19–23]. Studies in outpatient settings also conclude that nursing staff can contribute to reduce preoperative anxiety, namely by helping the patient to understand the surgical experience, listening and responding to patients' concerns, giving information about what they will face on the operation day and on the post-surgery period, giving them confidence within a calm environment, and reducing uncertainty by clarifying doubts [5,17–22].

Studies have demonstrated that anxiety is associated with a slower wound healing and a slower and more painful recovery [9–12]. Although research suggests that an empathic patient-centered approach is effective in reducing patients' preoperative anxiety in both inpatient and outpatient care, to the best of our knowledge no research has examined the effects of these interventions on patients' physiological outcomes, namely surgical wound healing.

The aim of this study is to evaluate the effect of a preoperative empathic patient-centered intervention on the preoperative anxiety and post-surgical recovery of patients in ambulatory surgery. This is an increasingly common procedure, but research on the effects of empathic patient-centered approaches in this context is scarce.

## 2. Methods

### 2.1. Setting

The study was conducted in a general hospital in Northern Portugal between August 2013 and July 2014.

### 2.2. Measures

#### 2.2.1. Baseline socio-demographic and clinical data

Sex, age, education, residence, marital status, professional status, previous surgeries, psychiatric history, use of psychotropic drugs and type of anesthesia employed in the surgery were collected from participants' clinical records. Patients' trait anxiety (representing a stable anxiety that is characteristic of an individual, distinct from a state anxiety, which is transient and dependent upon the occurrence of particular events [33–36]) was assessed with the State-Trait Anxiety Inventory Form Y (described in Section 2.2.2). Research on socio-demographic and clinical factors showed that these variables are important anxiety predictors [37]. Regarding the surgery, the American Society of Anesthesiologists' (ASA) criteria were used to assess patients' physical status. These criteria follow an algorithm for the assessment of surgical risk, divided in six categories, from I- healthy person to VI-declared brain-dead person [8]. Ambulatory surgery guidelines [3,4,8] recommend that only patients classified as ASA I–III be accepted for ambulatory surgery. An anesthesiologist routinely performs this evaluation on all the patients and decides the type of anesthesia to be employed, either local (e.g., Monitored Anesthesia Care—MAC) or general anesthesia [8,37].

#### 2.2.2. Outcome measures

Anxiety was assessed with the State-Trait Anxiety Inventory Form Y (STAI-Y). The STAI-Y is a 20-item self-report instrument which includes separate measures of state and trait anxiety. The original STAI was constructed by Spielberger [34] and has been adapted to more than 30 languages for cross-cultural research and clinical practice. Reliability and validity tests have provided sufficient evidence that the STAI-Y is an appropriate and adequate measure for studying anxiety in research and clinical settings. The Portuguese form of the questionnaire [33] was used in the present study. Each subtest ranges from 20 to 80, higher scores indicating greater anxiety. A cut-off point of 39–40 has been suggested for detection of clinically relevant symptoms for the state anxiety scale, with a higher score for older adults. Test–retest reliability coefficients for the Portuguese version range from 0.31 to 0.86, with temporal application intervals ranging from 1 h to 104 days [33,36].

Post-surgical clinical outcomes were collected from patients' clinical records. These data are routinely assessed by nurses one day after the surgery, according to ambulatory surgery guidelines [3,4,8]. They included pain, return to active life, and we used a surgery recovery score obtained from the presence or absence of the remaining aspects: fever, sleep, blood loss, analgesic consumption, nausea/vomiting and need for (further) healthcare resources, all self-reported. In addition, the guidelines include the assessment of patients' satisfaction with the quality of preoperative information delivered by nurses. The surgery recovery score was used as a recovery index ranging from 0 (good recovery) to 6 (poor recovery). Pain, level of activity after surgery and quality of the information received were each evaluated on Likert-type numeric rating scales ranging from 0 (painless, not active, poor quality) to 4 (excruciating pain, normal life activities, excellent quality). Numeric rating scales are self-reported simple and universal instruments with demonstrated validity and sensitivity in studies of pain in Portuguese samples [38].

Surgical wound healing was evaluated with three dimensions one month after the surgery and according with the hospital's routine care endorsed in the ambulatory surgery guidelines [3,4,8]: local pain, type of tissue and presence of exudate. Local pain was again assessed through a self-report numeric rating scale varying from 0– painless to 4–excruciating pain [38]. Type of tissue and exudate are criteria of the Pressure Ulcer Scale for Healing (PUSH), used for nurses' direct assessment of the wound. Evaluation and registration of the wound status are fundamental throughout the surgical treatment process. The PUSH is a useful tool for assessing and establishing goals, as well as for evaluating the course of the surgical wound. A total PUSH score can be obtained by adding the values of the scale's three parameters (surface area, exudate and type of wound tissue). Values range from 0 (tendency to scarring) to 17 (deterioration of the wound) [39–41]. This study uses exudate and type of wound tissue levels obtained through the Portuguese adaptation of the PUSH [40], each registered on a Likert-type scale ranging from 0 (scarring tissue, no exudate) to 4 (necrotic tissue, abundant exudate). The PUSH has shown good psychometric properties, with a level of internal consistency of 0.78 [39–41].

### 2.3. Participants

A convenience sample of adult participants (ages above 18 years old) was selected from the hospital records of patients undergoing general ambulatory surgery during August 2013 through July 2014. Patients diagnosed with major psychiatric or neurological pathologies were excluded to ensure understanding of consent forms and evaluation instruments. One hundred and four eligible patients were contacted during that period and received verbal and written information about the study. All accepted to participate, having signed an informed consent form. The study was approved by the

hospital administration and ethics committee (088/2013-7). The sample's characteristics are presented in Table 1.

### 2.4. Procedure

The 104 participants were randomly assigned to the intervention (IG) and the control (CG) groups. The CG received the routinely delivered standardized information about hospitalization norms and description of the surgical preparation procedures in an individual interview lasting 15 min. This interview includes a question eliciting patients' doubts about the information received, but lacks consideration for personal concerns and emotions. The IG received a 15-min individual interview applied by a trained nurse following a patient-centered approach. The intervention consisted of initially eliciting and exploring patients' questions and personal concerns about the surgery, and then addressing these questions and concerns in a customized fashion through delivery of personalized information and empathic response to emotions through explicit appreciation of these emotions, leading to a sense of validation and understanding [29–32]. For this study, a nurse trained in communication skills (LP) invited three other hospital ambulatory surgery nurses and trained them on the empathic patient-centered approach. Training occurred on the week before the interviews and consisted of a two-hour individual session that included presenting the materials and examples of interactions, and practicing with discussion and feedback until the skills were acquired.

Patients were assessed immediately before (T0) and immediately after (T1) their pre-surgical appointment at the hospital, one month before the surgery. Follow-up assessment was performed by a nurse, according to the ambulatory surgery guidelines, 24 h after the surgery through telephone interviews (T2) and one

**Table 1**  
Sample's socio-demographic, psychological and clinical characteristics.

	Total (n = 104)	Control group (n = 52)	Intervention group (n = 52)
Age (years) mean (SD)	43.7 (14.5)	44.2 (14.7)	44.1 (14.5)
Education (years) mean (SD)	10.9 (3.1)	10.4 (2.9)	11.4 (3.2)
Sex n (%)			
Male	69 (66.3)	33 (63.4)	36 (69.2)
Female	35 (33.7)	19 (36.5)	16 (30.8)
Marital status n (%)			
Single	33 (31.7)	19 (36.5)	16 (30.8)
Married	69 (66.4)	32 (61.5)	35 (67.3)
Others	2 (1.9)	1 (1.9)	1 (1.9)
Surgeries n (%)			
Yes	23 (22.1)	11 (21.5)	12 (23.1)
No	81 (77.9)	41 (78.8)	40 (76.9)
Surgery type n (%)			
Inguinal Hernia Repair	32 (30.8)	12 (23.1)	20 (38.5)
Hemorrhoidectomy	11 (10.6)	5 (9.6)	6 (11.5)
Pilonidal sinus resection	17 (16.3)	9 (17.3)	8 (15.4)
Other	44 (42.3)	26 (50.0)	18 (34.6)
Anesthesia type n (%)			
General	74 (71.2)	34 (65.4)	40 (76.9)
Local (MAC)	30 (28.8)	18 (34.6)	12 (23.1)
ASA surgical risk n (%)			
ASA I	64 (61.5)	34 (65.4)	30 (57.7)
ASA II	37 (35.6)	17 (32.7)	20 (38.5)
ASA III	3 (2.9)	1 (1.9)	2 (3.8)
Trait anxiety mean (SD)	36.8 (8.9)	38.4 (9.3)	35.2 (8.5)
State anxiety mean (SD)	36.3 (10.7)	38.7 (11.5)	33.9 (9.2)

ASA: American society of anesthesiologists; MAC: monitored anesthesia care; SD: standard deviation.

month after the surgery, at the hospital (T3). The follow-up measures are those endorsed by the ambulatory surgery guidelines and are routinely applied in the hospital and widely employed in this context.

Patients' state anxiety was assessed at T0–T3. Data referring to post-surgical clinical outcomes and satisfaction with preoperative information were obtained at T2. Surgical wound healing was evaluated at T3. Baseline socio-demographic and clinical data referring to medical history, surgical and anesthetic procedures, and patients' trait anxiety were collected at T0. The study design and evaluation procedures are detailed in Fig. 1.

### 2.5. Analysis

Data were analyzed in PASW 18.0 (Predictive Analytics Software). Repeated-measures procedures were used to evaluate change in anxiety over time. Chi-square and independent-samples *t*-tests were used to compare the groups regarding socio-demographic and clinical variables, anxiety levels and follow-up assessment variables. Bonferroni correction was used for multiple comparisons ( $\alpha = 0.013$ ).

## 3. Results

### 3.1. Baseline anxiety, socio-demographic and clinical assessment

The IG and the CG were similar regarding anxiety levels, socio-demographic and clinical characteristics. At baseline, no statistically significant differences were found between the two groups regarding age, sex, educational level and marital status, number of previous surgeries and type of surgery performed, physical status/surgical risk and type of anesthesia received or levels of state and trait anxiety.

**Table 2**

Anxiety at T0, T1 and T3.

	Evaluation times			Differences over time <sup>b</sup>	
	T0	T1	T3	T1 – T0	T3 – T1
Control group (n = 52)	38.7 (11.5)	38.5 (11.2)	37.9 (11.4)	–0.2 (–0.3)	–0.6 <sup>*</sup> (0.2)
Intervention group (n = 52)	33.9 (9.2)	31.6 (9.4)	30.7 (9.3)	–2.3 <sup>*</sup> (0.2)	–0.9 <sup>*</sup> (–0.1)
Differences between groups <sup>a</sup>	4.8 (2.3)	6.9 <sup>*</sup> (1.8)	7.2 <sup>*</sup> (2.1)		

T0: before the preoperative interview; T1: after the preoperative interview; T3: after the surgery. State anxiety assessed with the STAI-Y 1.

<sup>\*</sup>  $p < 0.001$ .

<sup>a</sup> Independent-samples *t*-test.

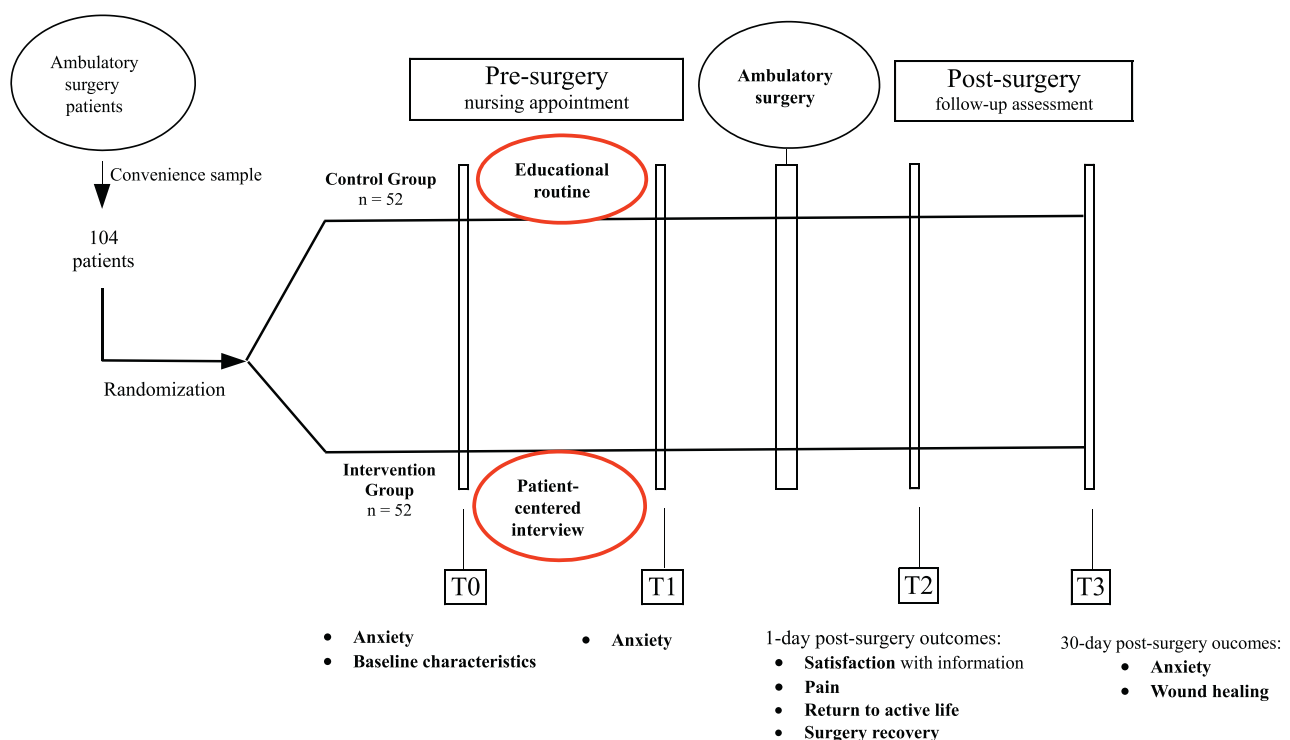
<sup>b</sup> Repeated-measures, within-subjects contrasts.

### 3.2. State anxiety

Repeated-measures procedures show that state anxiety levels decreased significantly over time in both the CG ( $F(1) = 14.748$ ;  $p = 0.000$ ) and the IG ( $F(1) = 56.991$ ;  $p = 0.000$ ) as shown by Greenhouse–Geisser, Huynh–Feldt and lower-bound tests. Within-subjects contrasts indicate that this decrease is significant in the IG from T0 to T1 ( $F(1) = 46.815$ ;  $p = 0.000$ ) and from T1 to T3 ( $F(1) = 30.651$ ;  $p = 0.000$ ). In the CG, however, the decrease is significant only after the surgery, at T3 ( $F(1) = 12.317$ ;  $p = 0.001$ ) (Table 2). In addition, the IG showed significantly lower levels of state anxiety than the CG after the intervention, at both T1 ( $t(102) = 3.390$ ;  $p = 0.001$ ) and T3 ( $t(102) = 3.535$ ;  $p = 0.001$ ) (Table 2).

### 3.3. Surgery recovery and information satisfaction

After the surgery, at T2, the IG showed significantly lower levels of pain ( $t(95) = 3.607$ ;  $p = 0.000$ ), better surgery recovery



**Fig. 1.** Study design and evaluation procedures.

**Table 3**  
Follow-up assessment.

Recovery and Satisfaction <sup>a</sup> —means (standard deviations)			
	CG (n = 52)	IG (n = 52)	Differences between groups <sup>b</sup>
Satisfaction with information at T2	2.4 (0.6)	2.7 (0.5)	0.3 <sup>*</sup> (0.1)
Clinical assessment at T2			
Pain	0.7 (0.6)	0.3 (0.5)	0.4 <sup>**</sup> (0.1)
Activity level	2.5 (0.9)	3.1 (0.7)	0.6 <sup>**</sup> (0.2)
Surgery recovery	1.2 (0.7)	0.8 (0.5)	0.4 <sup>*</sup> (0.2)
Surgical wound healing at T3			
Exudate level	0.3 (0.6)	0.1 (0.3)	0.2 (0.3)
Tissue type	0.4 (0.7)	0.1 (0.3)	0.3 <sup>*</sup> (0.4)
Local pain	0.4 (0.5)	0.1 (0.3)	0.3 <sup>*</sup> (0.2)

IG: intervention group; CG: control group; T2: one day after the surgery; T3: one month after the surgery.

<sup>\*</sup>  $p < 0.01$ .

<sup>\*\*</sup>  $p < 0.001$ .

<sup>a</sup> Obtained from patients' clinical records (according to ambulatory surgery guidelines for patient assessment): patients' satisfaction with the quality of preoperative information, pain and level of daily activity evaluated with numeric rating scales, each ranging from 0 (poor, painless, not active) to 4 (excellent, excruciating pain, normal life activities); surgery recovery index reflecting the presence or absence of several symptoms, ranging from 0 (good recovery) to 6 (poor recovery); surgical wound healing items measured through the PUSH, each ranging from 0 (no exudate, scarring tissue) to 4 (abundant exudate, necrotic tissue), and local pain evaluated through a numeric rating scale ranging from 0 (painless) to 4 (excruciating pain).

<sup>b</sup> Independent-samples *t*-test.

( $t(102)=3.075$ ;  $p=0.003$ ) and higher levels of physical activity ( $t(102)=3.824$ ;  $p=0.000$ ) than the CG. The IG also reported significantly more satisfaction with the quality of the preoperative information received than the CG ( $t(102)=2.666$ ;  $p=0.009$ ) (Table 3).

At T3, the IG showed significantly lower levels of local pain ( $t(102)=3.261$ ;  $p=0.002$ ) and better wound tissue type ( $t(102)=2.893$ ;  $p=0.005$ ) than the CG (Table 3). However, no significant difference was found between the two groups regarding wound exudate ( $t(102)=2.021$ ;  $p=0.046$ ).

## 4. Discussion and conclusion

### 4.1. Discussion

Our results indicate that an empathic patient-centered approach applied to preoperative interviews reduced anxiety levels and promoted a better post-surgical recovery in patients undergoing general ambulatory surgery. These results lend support to the higher efficacy of patient-centered empathic interventions when compared with routine informative interviews [22,31] and highlight the advantages of focusing on each patient's needs, emotions and fears regarding the surgery. This study also provides support for the patient-centered model of communication, including the empathic approach addressing emotions, in clinical practice [29–32]. The application of this model improved not only patients' psychological health and satisfaction with the information received, but also physical recovery, both self-reported and externally assessed.

The efficacy of preoperative interventions in reducing anxiety and increasing patients' satisfaction has been recognized, particularly when empathic patient-centered approaches are used, [5,13–28]. The present study extended these findings to physical outcomes of recovery and to the context of ambulatory surgery, a rising surgical option for procedures with short anesthesia and operating times. We confirmed that anxiety levels decreased significantly before the surgery in the intervention group exclusively, and satisfaction with the quality of the information delivered by nurses was greater in this group than in the group receiving the routine informative interview. The decrease in anxiety observed in both groups of patients after the surgery reflects the expected evolution in anxiety levels. These are typically

higher before the surgery and decrease with time [13]. After the surgery, the intervention group showed lower levels of pain, higher levels of daily activity, better surgery recovery and wound healing than the control group. Greater recovery and satisfaction are important markers of health care quality [2–4,8,14,23].

The sample size limited our study, and we recommend that considerably more work be done to determine the effect of an empathic patient-centered approach delivered by nurses on surgical outcomes, namely wound healing. It is possible that this approach directly effects both preoperative anxiety and post-surgical outcomes. Alternatively, it may lead to a decrease in preoperative anxiety which, in turn, contributes to a better post-surgical recovery, by counteracting the effects of anxiety on a slower, more complicated and painful postoperative recovery [5–13]. Future studies are needed to disentangle these effects. Further studies should also assess the effect of anxiety on surgical wound healing in patients submitting to the same surgical procedures.

Our results highlight the importance of training nurses on communication skills, specifically on empathic patient-centered approaches. Our study shows that this model is applicable to ambulatory surgery preoperative interviews and can be implemented within the same time frame as current routine preoperative interviews. This and other studies [22,23,31,32] indicate that application of this model to nurses' general care of patients undergoing surgery and thereafter is promising and warrants further research.

## 5. Conclusion

Our results show that an empathic patient-centered approach applied at the pre-operative nursing appointment significantly reduces patients' preoperative anxiety, improves surgical recovery and wound healing, and increases patient satisfaction with the quality of the information provided.

## 6. Practice implications

This study highlights the efficacy of a brief and feasible patient-centered approach which can be taught to, and applied by nurses in routine care in various surgical contexts.



## Conflict of interest

No conflict of interest has been declared by the authors.

## Role of funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

## Acknowledgements

The authors gratefully acknowledge the contributions of Teresa McIntyre, for suggestions. The authors also thank all the patients who agreed to participate in this study.

## References

- [1] P. Lemos, M. Monteiro, L. Fonseca, Can we find predictive factors of postoperative vomiting after day surgery? *Acta Med. Port.* 21 (2008) 335–340.
- [2] P. Lemos, A. Pinto, G. Morais, Patient satisfaction following day surgery, *J. Clin. Anesth.* 21 (2009) 200–205.
- [3] Direcção Geral de Saúde—Definição de Cirurgia de Ambulatório. Disponível em URL: <http://portal.arsnorte.minsau.de.pt/portal/page/portal/SGLC/Licenciamento/C3%81reas/Unidades%20Privadas%20Sa%C3%BAde%20com%20Internamento/Legisla%C3%A7%C3%A3o%20espec%C3%ADfica>.
- [4] C. Toftgaard, G. Parmentier, International terminology in ambulatory surgery and its worldwide practice, in: P. Lemos, P. Jarrett, B. Philip (Eds.), *Day Surgery—Development and Practice*, International Association for Ambulatory Surgery, London, UK, 2006, pp. 35–59.
- [5] L. Bailey, Strategies for decreasing patient anxiety in the perioperative setting, *AORN J.* 92 (4) (2010) 445–460.
- [6] M.L. Bellani, Psychological aspects in day-case surgery, *Int. J. Surg.* 6 (2008) 544–546.
- [7] C. Fink, M.K. Dienner, T. Brucker, G. Muller, L. Paulsen, M. Keller, M.W. Buchler, P. Knebel, Impact of preoperative patient education on prevention of postoperative complications after major visceral surgery: study protocol for a randomized controlled trial (PEDUCAT trial), *Trials* 14 (2013) 271.
- [8] J.C. Rothrock, *Alexander's Care of the Patient in Surgery*, 14th ed., Mosby, St. Louis, MO, 2011.
- [9] D. Upton, Mood disorders in patients with acute and chronic wounds: a health professional perspective, *J. Wound Care* 21 (2012) 42–48.
- [10] J.P. Gouin, J.K. Kiecolt-Glaser, The impact of psychological stress on wound healing: methods and mechanisms, *Immunol. Allergy Clin. N. Am.* 31 (1) (2011) 81–93.
- [11] J.K. Kiecolt-Glaser, R. Glaser, Methodological issues in behavioral immunology research with humans, *Brain Behav. Immun.* 2 (1998) 67–78.
- [12] J.K. Kiecolt-Glaser, R. Glaser, Psychological influences on surgical recovery. Perspectives from psychoneuroimmunology, *Am. Psychol.* 53 (11) (1998) 1209–1218.
- [13] C.A. Mendes, A. Silva, G. Fonseca, Influence of a preoperative psycho-educative program in the levels of anxiety in the post operative patient, *Rev. Ref. II* (2005) 9–14.
- [14] T.F. Gardner, M.U.S. Nnadozie, B.A. Davis, Patient anxiety and patient satisfaction in hospital-based and freestanding ambulatory surgery centers, *J. Nurs. Care Qual.* 20 (2005) 238–243.
- [15] M. Mitchell, General anaesthesia and day-case patient anxiety, *J. Adv. Nurs.* 66 (2010) 1059–1071.
- [16] J.A.M. Marcolino, F.M. Suzuki, L.A.C. Alii, Measurement of anxiety and depression in patients preoperatively. Comparative study, *Rev. Bras. Anesthesiol.* 57 (2) (2007) 157–166.
- [17] L.Y. Kiyohara, L.K. Kayano, L.M. Oliveira, et al., Surgery information reduces anxiety in the pre-operative period, *Rev. Hosp. Clin. Fac. Med.* 59 (2004) 51–56.
- [18] O. Karayurt, The effects of different preoperative teaching methods on state anxiety preoperative period and level of the pain postoperatively, *J. Cumhur. Univ. Sch. Nurs.* 2 (1998) 20–26.
- [19] M. Mitchell, A patient-centered approach to day surgery nursing, *Nurs. Stand.* 24 (2010) 40–46.
- [20] M.J. Pritchard, Managing anxiety in the elective surgical patient, *Br. J. Nurs.* 18 (2009) 416–419.
- [21] A.R. Kempe, R. Gelazis, Patient anxiety levels—an ambulatory surgery study, *AORN J.* 41 (1985) 390–396.
- [22] S. Gonçalves, M. Figueiredo-Braga, Communicate, inform and educate in preoperative anxiety—development of a brief intervention, *Rev. Psiquiatr. Clínica* 33 (2012) 99–108.
- [23] C. Soltner, J.A. Giquello, C. Monrigal-Martin, Continuous care and empathic anesthesiologist attitude in the preoperative period: impact on patient anxiety and satisfaction, *Br. J. Anaesth.* 106 (2011) 680–686.
- [24] M. Cooke, W. Chaboyer, M.A. Hiratos, Music and its effect on anxiety in short waiting periods: a critical appraisal, *J. Clin. Nurs.* 14 (2005) 145–155.
- [25] K.J. Walker, A.F. Smith, Premedication for anxiety in adult day surgery, *Cochrane Database Syst. Rev.* (4) (2009) CD002192.
- [26] N. Brick, Premedication for anxiety in adult day surgery patients, *AORN J.* 92 (2010) 101–102.
- [27] F.S. Weber, The influence of playful activities on children's anxiety during the preoperative period at the outpatient surgical center, *J. Pediatr. (Rio J.)* 86 (2010) 209–214.
- [28] J.K. Carroll, E. Cullinan, L. Clarke, The role of anxiolytic premedication in reducing preoperative anxiety, *Br. J. Nurs.* 21 (2012) 479–483.
- [29] K.A. Stepien, A. Baernstein, Educating for empathy. A review, *J. Gen. Intern. Med.* 21 (5) (2006) 524–530.
- [30] A.L. Suchman, K. Markakis, H.B. Beckman, R. Frankel, A model of empathic communication in the medical interview, *JAMA* 277 (8) (1997) 678–682.
- [31] M.A. Stewart, Effective physician-patient communication and health outcomes: a review, *CMAJ* 152 (1995) 1423–1433.
- [32] M. Stewart, J.B. Brown, A. Donner, I.R. McWhinney, J. Oates, W.W. Weston, J. Jordan, The impact of patient-centered care on outcomes, *J. Fam. Pract.* 49 (9) (2000) 796–804.
- [33] L. McIntyre, *State Trait Anxiety Inventory (STAI). Versão de investigação*, Universidade do Minho, Braga, 1995.
- [34] C.D. Spielberger, *Manual for the State-Trait Anxiety Inventory (STAI: Form Y)*, Consulting Psychologists Press, Palo Alto, CA, 1983.
- [35] C.D. Spielberger, *State-Trait Anxiety Inventory and State-Trait Anger Expression Inventory*, in: M. Maruish (Ed.), *The Use of Psychological Tests for Treatment Planning and Outcome Assessment*, Erlbaum, Hillsdale, NJ, 1994, pp. 292–321.
- [36] T. McIntyre, P. Carvalho, G. Milhazes, Anxiety and depression in the pregnancy process: preliminary data, *Rev. Port. Anest.* 08 (02) (1997) 57–65.
- [37] W. Caumo, Risk factors for preoperative anxiety in adults, *Acta Anesthesiol. Scand.* 45 (2001) 298–307.
- [38] M.A. Ferreira-Valente, J.L. Pais-Ribeiro, M.P. Jensen, Validity of four pain intensity rating scales, *Pain* 152 (10) (2011) 2399–2404.
- [39] K. Furtado, Preventing pressure ulcers: a quality certificate, *Nursing* 175 (2003) 20–23.
- [40] P.L. Ferreira, Measuring the quality of life of patients with chronic wounds: the pressure ulcer scale for healing and wound impact of Cardiff schedule, *Nursing* 221 (2007) 32–41.
- [41] N.A. Stotts, An instrument to measure healing in pressure ulcers: development and validation of the pressure ulcer scale for healing (PUSH), *J. Ger. Med. Sci.* 56A (2001) 795–799.