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A Nurse Led Pre-Operative Patient Education Intervention and its Effect on Anxiety Levels in General Surgical Patients

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A Nurse Led Pre-Operative Patient Education Intervention and its Effect on Anxiety Levels in General Surgical Patients

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Abstract

Background

Substantial research has shown anxiety can negatively affect patients during the surgical period. Healthcare staff have limited time to educate.

Objectives

This study assessed the effect of pre-operative patient education on general surgical patients' level of state anxiety. Also, compared the differences of pre and post intervention anxiety scores between patients undergoing different types of surgery and anticipating varied length of hospital stay.

Methods

A one-hour educational class, either in-person or online, provided information about surgery and recovery phase to 20 pre-operative patients. Participants' anxiety levels before and after the class were measured using the State Anxiety Inventory questionnaire. Paired t-tests were used to compare anxiety levels before and after the intervention. Changes in anxiety levels within different lengths of stay and types of surgery were also assessed. One open-ended question was asked to assess perceptions of the education.

Results

Patients' state anxiety levels decreased significantly from $M = 41.85$ ($SD = 11.64$) pre-intervention to $M = 34.85$ ($SD = 10.08$) post-intervention, $t\ (19) = 3.75$, $p < .001$. However, there was no significant difference in the change of anxiety level between different surgical groups and anticipated varied length of stay. Written feedback from participants indicated the intervention helped with preparing for surgery, increasing confidence, and decreasing anxiety.

Conclusion

Nurse led verbal pre-operative education decreases anxiety in surgical patients which may lead to improvement in patient self-efficacy and outcomes. Further research is needed to determine whether these findings are generalizable.

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A Nurse Led Pre-Operative Patient Education Intervention Effect on Anxiety Levels in General Surgical Patients

Background

Long standing research has shown anxiety affects a patient's experience with surgery. Common concerns among patients and families include fear of the unknown, the possibility of pain, and the impact of surgery on quality of life post-operatively (Prichard, 2011). Lack of health knowledge can be a stimulus for higher anxiety in surgical patients (Sadati et al., 2013). In addition to the aforementioned factors, the type of surgery can influence anxiety levels. When surgery is more life-altering, such as mastectomy or gastrointestinal surgeries, anxiety may be more significant (Pritchard, 2009). Other factors that may contribute to higher anxiety during the pre-operative period include loss of independence and privacy, fear of death, and a history of smoking (Wilson et al., 2016).

Anxiety in hospitalized patients, specifically adult surgical patients, can affect their outcomes and recovery. Anxiety can have a negative physiological effect on patients contributing to slower and/or poor recovery (Harkness et al., 2003). It may also exacerbate signs and symptoms of comorbidities (Guo et al., 2012). Higher anxiety levels affect a patients' perception of post-operative pain, analgesic use, and length of stay (Sadati et al., 2013). Furthermore, anxiety can negatively affect knowledge retention, self-care, and patient participation within the healthcare team (Sjöling et al., 2003). Additionally, higher anxiety levels increase the need for therapeutic intervention causing an increase of medical costs, such as, medications and providers' time (Marciniak et al., 2005).

Many patients continue to come to the hospital uneducated and worried about their surgery (Garretson, 2004). Other healthcare fields have found benefits of patient education

before their procedure. When knee joint replacement patients received pre-operative education, surgical orthopedics found a reduction in the length of stay, as well as, anxiety and pain levels decreased faster after surgery without an increase of complication or readmission rates (Jones et al., 2011; Sjöling et al., 2003). Pre-procedure cardiology literature noted a decrease in depression and anxiety in Chinese patients when patients received education (Guo et al., 2012). The reduction of anxiety leads to more positive outcomes, such as, a decrease in complications like slow wound healing and a better quality of life (Aasa et al., 2013; Ayyadhah Alanazi, 2014). Garretson (2004) has found that length of stay is shorter and infection rates are reduced in patients who receive pre-operative education. Providing more patient education pre-operatively contributes to better knowledge retention (Aasa et al., 2013; Gezer & Arslan, 2019). Educated patients create a safer environment, such as, the reduction of medication and procedure errors through communication with the healthcare team (The Joint Commission, 2016). A well-knowledgeable patient reduces pre-operative anxiety levels and makes the unknown more familiar (Ayyadhah Alanazi, 2014; Nikumb et al., 2009).

Problem Statement

At an urban hospital within the Rocky Mountain region, there were preparatory courses for joint replacement and bariatric surgeries; however, there was not a course for the general surgical patient undergoing surgery for gastrointestinal, urinary, urogynecology, and/or endocrine issues. Most surgical patient education occurred during clinic visits with medical providers preceding surgery. Educational discussions were limited to what providers could discuss within the time constraints of a pre-surgical appointment and generally focused on the surgical procedure itself.

Purpose

This study assessed the effects of a pre-operative patient educational class has on surgical patients' feeling of anxiety for their scheduled surgery at an urban, acute care hospital.

Specific Aims

The specific aims of our study were to:

1. Create and implement a one-hour long, on-site or online, educational class for general surgical patients and families to attend prior to their surgery.
2. Assess patients' anxiety levels before and after the educational class using the state anxiety subset of the State-Trait Anxiety Inventory (STAI) questionnaire.
3. Assess the relationship between anxiety levels, expected length of hospital stay, and type of surgery.
4. Examine the patient's perception of how the class will help them plan for their upcoming surgery.

Significance

Living in the digital age, there are many methods and avenues to find and access information. According to Fox (2014), 72% of adults conduct internet searches for health information and many seek information online prior to consultation with physician (Seckin, 2014). Misleading and erroneous information can be disseminated through the internet, social media, and word of mouth (Murugiah et al., 2011). Furthermore, the information available on websites are typically not monitored by certified health professionals (Fahy et al., 2014).

Professional nurses are responsible for educating their patients as a component of their occupation (American Organization of Nurse Executives, 2010). According to Pritchard (2011), nurses can help to minimize patients' anxiety levels by providing pre-surgical education. In

addition, Garretson (2004) observed patient satisfaction was greater and anxiety was less, when nurses were giving the instructions.

Quality patient education can benefit patients in a variety of ways. Elgin (2018) notes that 35% of the U.S. population has a basic or below basic level of health literacy. Increasing patients' knowledge related the healthcare process through patient education increases the likelihood that they will be engaged with their care (Elsevier, 2015; Elgin, 2018). Being able to retain and recall post-operative instructions after discharge can impact the recovery period (Elgin, 2018). In addition, patient education can increase patient satisfaction, decrease length of stay, and decrease infection rates (Ellrich & Yu, 2015; Garretson, 2004; Wilson et al., 2016).

The American College of Surgeons (ACS) provides some guidelines on what to teach surgical patients. These guidelines are intended to assist physicians in educating their patients about topics such as consent guidelines, the patient's bill of rights, surgical risk/benefit, and procedure description (ACS, n.d.). ACS (2006) recognizes the need for quality patient education to create a well-informed patient who can be an effective member of the healthcare team. However, there are no ACS guidelines about the best methods or timing for teaching this information.

Printed materials are the most prevalent method of delivery of surgical patient education (Ronco et al., 2012). It is unclear which education delivery strategy is best for surgical patients (Ayyadhah Alanazi, 2014; Elgin, 2018). Furthermore, it is unclear if pre-operative education can reduce the state anxiety level among patients with different types of surgeries or different expected lengths of stay. Wilson et al. (2016) reported that providing written materials reduced patients' anxiety, which was further reduced through a class format. The authors noted that the

classroom format allowed the opportunity for patients to ask questions and engage in a dialog outside of the chaotic post-operative environment (Wilson et al., 2016).

Literature Review

Literature discussing pre-operative education and the effect on anxiety levels in general surgical patients was appraised. Databases used were CINHAL, Cochrane Library, and Scopus using keywords, such as, “pre-operative or preoperative,” “patient education,” and “anxiety” with a limit of adult population. Excluded from the review were orthopedic, cardiac, pediatric, and same-day surgery patient populations as these types of interventions are not typically admitted to the general surgical unit. Overall, this review showcases a range of different methods of educational delivery, topics discussed, evaluation tools, and outcomes.

Several different methods of patient education have been described in the literature, however, none of the studies delivered education in a classroom or webinar format. There were no reports of which methodology is best. The most popular method was to meet with participants in one-on-one meetings in various settings prior to their surgical day. A Swedish study described colorectal patient education delivered in verbal and written formats by nursing staff a week before surgery using an individualized 2-hour session (Aasa et al., 2013). An Iranian study conducted one-on-one verbal education sessions with a nurse compared to a booklet to disseminate information the night before cholecystectomy or hernia repair surgery (Amini et al., 2019). Also in Iran, nurses met with female cholecystectomy patients individually the day prior to surgery to discuss information regarding pre- and post-operative education (Sadati et al., 2013). Finally, a day or two prior to abdominal surgery nurses in Taiwan conducted one-on-one educational sessions that lasted up to a half hour (Lin & Wang, 2005).

Other studies used written materials, videos, and websites for educational delivery prior to surgery (Gezer & Arslan, 2019; Hering et al., 2005; Kakinuma et al., 2011; O'Connor et al., 2014; Salzwedel et al., 2008). Personalized leaflets were used with colorectal surgical patients that corresponded to their specific type of surgery in Ireland (O'Connor et al., 2014). Thyroidectomy patients were provided educational booklets the day before surgery in Turkey (Gezer & Arslan, 2019). Another methodology used with surgical patients pre-operatively were videos which discussed the anesthesia process and procedures with anesthesiologists in Japan and Germany (Kakinuma et al., 2011; Salzwedel et al., 2008). A different study used an informational website that was accessed by patients in the medical clinic about the anesthesia process and procedures (Hering et al., 2005). A classroom format, including webinar or online, to educate patients was not found in the literature.

There was a wide range of educational topics used in the studies; however, there was no evidence of which topics are most likely to decrease anxiety levels with general surgical patients. The most common topic was on the anesthetic process and procedures including different types of anesthesia, surgical risks and benefits, and possible complications (Amini et al., 2019; Hering et al., 2005; Kakinuma et al., 2011; Salzwedel et al., 2008). Other education focused more on pre- and post-operative instructions and guidelines; such as, familiarizing patients with the operating room environment and events that occur during the post-operative period while in the hospital (Aasa et al., 2013; Amini et al., 2019; Gezer & Arslan, 2019; Sadati et al. 2013). A study by Lin and Wang (2005) included pain management information along with standard patient education. Another type of patient education studied focused on diagnosis and treatment plan in conjunction with the patients' upcoming surgery (O'Connor et al., 2013).

The literature revealed four evaluation tools designed to assess anxiety levels in general surgical patients and STAI was the most frequently used tool (Amini et al., 2018; Hering et al., 2004; Kakinama et al., 2011; Sadati et al., 2013; Salzwedel et al., 2008). All of the studies except Hering et al. (2004), selected this evaluation tool due to its reliability and validity in different languages, specifically German, Iranian, and Japanese. The Visual Analogue Scale for Anxiety was also used to measure anxiety in pre-operative patients (Ling & Wang, 2005; Salzwedel et al. 2008). O'Connor et al. (2014) selected the Hospital Anxiety and Depression Scale due to its ease of use. Gezer and Arslan (2019) utilized the Anxiety Specific to Surgery Questionnaire with thyroidectomy patients. While there is no evidence that any of these evaluation tools is best for measuring anxiety levels in surgical patients, using the STAI evaluation tool could make comparisons among studies easier because of its popularity. The STAI reliability and validity across various populations and ease of use also supported its selection for this study.

Results of studies assessing the impact of education on anxiety levels were mixed. Several studies in which physicians, anesthesiologists, and advanced practice nurses educated patients on their surgical procedure or anesthesia processes reported no change in patient anxiety levels, despite large sample sizes (Gezer & Aslan, 2019; Hering et al., 2005; Kakinuma et al., 2011; Salzwedel et al., 2008). In contrast, smaller studies in which nurses educated patients using both written and verbal communication found a decrease in patient anxiety levels (Amini et al., 2018; Lin & Wang, 2005; O'Connor et al., 2014; Sadati et al., 2013). Moreover, educational interventions which discussed pre- and post-surgical instructions using verbal and/or written methodology showed a decrease in anxiety levels across different evaluation tools (Amini et al., 2019; Gezer & Arslan, 2019; Lin & Wang, 2005; Sadati et al. 2013). A qualitative study conducted by Aasa et al. (2013) revealed that security, responsibility, participation, and trust

were important to surgical patients who had received education from a nurse. As one patient noted, "…after the session, it felt less frightening and threatening to be admitted to hospital" (Aasa et. al, 2013, p. 1608). These authors concluded that nurses should have face-to-face interaction when educating patients about the pre- and post-operative periods, supplemented with written materials, in order to decrease anxiety in surgical patients.

This literature review provides several insights to inform the delivery of pre-operative education to reduce patient anxiety levels. First, teaching a broader view of patient educational topics using more verbal and written communication is most likely to decrease anxiety levels among surgical patients. By having nursing staff who are experts in the post-operative period teach the course, could also have positive effects on anxiety levels. Given the lack of prior research, examining classroom and webinar delivery of pre-operative education may provide new insights related to the impacts of this method delivery on patient anxiety.

Theoretical Framework

Social Cognitive Theory (SCT) was adapted to assist in the change of patient behaviors (U.S. Department of Health and Human Services: National Cancer Institute, 2005). SCT was used to guide the intervention with a goal of decreasing anxiety in the pre-operative patient (Figure 1). The educational class filled in the unknown of the hospital environment and set expectations post-operatively, satisfying the first step in SCT, reciprocal determinism. The second step, behavioral capability, course objectives outlined the knowledge and skills to be successful during the post-operative period. Through the mastery of this new knowledge participants should have a decrease of fear of the unknown, causing a reduction in anxiety. Thirdly, understanding the expectations of before and after surgery promoted a decrease of anxiety. The fourth step was giving participants a timeline and guideline regarding the skills and

exercises will encourage self-efficacy and goal formation. Observational learning, the fifth step, included in the educational course were several videos and demonstrations about how to properly use the tools and exercises providing modeling for the participant. Finally, providing the rationale for each skill and exercise reinforces patient compliance and incentive to reduce the chance of complications post-operatively.

Variables

The demographic characteristics examined in this study included participants' age in years, gender, level of education, race, the distance from personal residence to hospital, and type of surgery. The population focus of this study was adult general surgical patients who receive different types of operative procedures; thus, the surgery type was categorized by anatomical system.

The independent variable was an hour-long group class that provides pre-operative patient education. The dependent variable was participants' pre-operative state anxiety scores. The measurement of the dependent variable was based on types of surgery and expected length of stay. Expected length of stay was defined as the number of nights the patient expects to be admitted to the hospital.

Methods

Research Design

A pre-test/post-test design was used to investigate changes in participants' state anxiety score before and after participating in a one-hour educational class about surgery and recovery after surgery. HealthOne and The George Washington Institutional Review Boards approved this as an expedited study.

Study Sample

This study used a convenience sample of adults who were scheduled to have general surgery at a metropolitan hospital in the Rocky Mountain region. General surgery includes procedures for gastrointestinal, gynecological, urinary, endocrine, and other cancer related processes. This intervention was open to all general surgical patients regardless of health history.

Inclusion Criteria

Participants of all gender, races, ethnicity, and religious affiliation were included if they met the following inclusion criteria: 1) were 18 years of age or older; 2) had scheduled a general surgical procedure for gastrointestinal, gynecological, urinary, endocrine, or other cancer related processes at the facility; and 3) were able to read, write, and understand English.

Exclusion Criteria

Participants were ineligible to participate in the study if they met the following exclusion criteria: 1) were receiving weight loss or orthopedic surgery as those patients have already received specialized pre-operative education; 2) surgical treatment for cardiac or neurology ailments because they are not typically admitted to the general surgical unit; and 3) received emergency or non-scheduled surgery were excluded due to the lack of time to attend the pre-operative class.

Recruitment of Subjects

Recruitment of study participants relied heavily on communication about the educational class using several modalities. Initially, four surgeons' offices were selected for primary focus due to the numbers of surgeries they complete at the facility. Prior to data collection, a letter of introduction outlining the project, educational intervention, educational objectives, and logistic and contact information was sent to the office managers. The primary investigator (PI) encouraged office staff to hand out promotional flyers to patients when it was determined that

the patient would be having surgery (Appendix A). Flyers were also posted in public areas throughout the medical campus. Multiple phone calls and meetings with each office manager occurred throughout the data collection to sustain momentum. In addition, a brief presentation of the study and educational intervention was given to general surgeons at surgical grand rounds to boost visibility and support. An open dialog with all facility's surgical department heads and the surgical readiness department was established to reduce any barriers during participant recruitment. Online methods for advertising included the facility's website and internal electronic newsletters. One physician allowed the PI to conduct classes in the clinical office one day a week.

Setting

The general surgical unit cared for approximately 1,200 patients in 2017, not including bariatric weight loss surgeries (personal communication, Sue Bachelder, February 15, 2018). The four surgeons' practice accounted for approximately 25 operative procedures a week. The facility is located in an urban area of the Rocky Mountain region. The average length of stay is 2.2 days (personal communication, Sue Bachelder, January 31, 2017). All patients are adults who are medically stable to withstand general surgery.

Intervention

Best Practices

Since the literature did not reveal evidence about which educational topics or delivery methodologies were most likely to reduce anxiety, professional groups were searched for best practices. The design of the educational program used in this study was based on evidenced-based practices for patient education from the ACS and for patient teaching in nursing. The ACS Principles of Patient Education provide guidance related to the topics that should be included in

pre-surgical education (ACS, 2006). In addition to these topics, best practices for patient teaching in nursing recommend covering patient plan of care, safety measures, health promotion, and pain management within patient teaching (Lippincot, 2017). According to Lippincot (2017), patient teaching should, “Provide an environment that's free from distractions and conducive to learning…Make sure that patient teaching sessions are interactive” (para. 6 &16). The course objectives reflect these evidenced-based practices (Appendix B). Additional evidence-based nursing practices were gleaned from policies and procedures at the facility, including the facility’s Up-To-Date account. The surgical staff nurses and the medical team from the surgeons’ offices agreed with the educational materials.

The Educational Class

The creation of the educational intervention was completed with the assistance of education professors at The George Washington University. As the literature suggested, the educational intervention was created with the level of patients’ healthcare literacy in mind. The class was understandable, legible, and interactive for participants and lay terms were used where possible; the Flesch-Kincaid reading level was 6.9.

The educational intervention occurred on-site at the medical campus in a classroom setting or the participant attended an online class. The PI was also the instructor of the course. Participants self-enrolled into the classes, therefore, education was received any time prior to surgery.

As shown in the literature, discussing pre- and post-operative information, events, and skills, demonstrate the best educational material to reduce anxiety in surgical patients. It was unknown what type of surgery the patient was having prior to the start of class; therefore, the focus of the education was general and applicable to all types of procedures. Class information

included logistical topics, such as location of check-in, cafeteria, and parking. Safety roles of the healthcare team, including the patient and family, components of bedside nurse report, and goals for discharge were also included in the educational class. Tools such as, an incentive spirometer, pulse oximetry, patient whiteboards, sequential compression devices, and environmental safety were demonstrated, and rationales provided. If the participant admitted to smoking, a smoking cessation handout was discussed and provided (Appendix C). A pain management handout was reviewed and given to all in-person participants (Appendix D). If participants chose, a paper copy of the PowerPoint slides was made available to take home.

The online class utilized the facility's meeting platform to set up and conduct the educational instruction through a video conference platform. Participants were able to attend by using a computer or tablet. Mobile formats, while feasible, were discouraged due to the small viewing window and inability to use all online meeting features easily, such as the chat box for the survey links. Handouts and PowerPoint slides were emailed to participants if they requested and provided an email address.

Instruments

Demographic Survey

Basic information was collected to look for any demographic influences. This data included age, gender, race, level of education completed, type of surgery, estimated length of hospital stay, and how far the participant must travel to the facility (Appendix E).

Anxiety Survey

Our study utilized the state anxiety subset of the STAI for analyzing anxiety levels in relation to the intervention. During the STAI's creation, a large sample of adults (n=1,838) were studied to ascertain reliability and construct validity among college students, prisoners, mental

health patients, and medical-surgical patients (Spielberger et al., 1983). The survey was found to have good reliability with a high alpha coefficient of 0.93 (Spielberger et al., 1983). Since then, the survey has been used widely in research within the social sciences, education, and dentistry (Spielberger et al., 1983). Additionally, it has been identified to have reliability with the elderly population (Spielberger et al., 1983). Permission to use the evaluation tool was granted from Mind Garden, publisher of the STAI, in both paper and electronic versions.

A scoring sheet provided by the survey owners was used for scoring individual questions. For the state anxiety inventory (SAI) a Likert scale is used and given a score of one to four. There are 20 questions on the survey thus, the scoring range is from 20-80, meaning the higher the score the higher the anxiety. There does not appear to be clinical ranking of what constitutes high, moderate, or low level of anxiety with this survey (Julian, 2011).

Open-Ended Question

One open-ended question was asked in written format after the class to gain some patient perception on “How did they feel the education session might help them prepare for their surgery?”

Data Collection Procedure

Prior to the start of class, participants received a copy of the information sheet for participation that included an overview of the study, researcher contact information, time commitment, and purpose of the study (Appendix F). It was emphasized that no personal information would be collected or shared.

The SAI survey administration was completed by the PI. A paper version of the SAI was administered twice, once before the class and again after class. The demographic survey was

administered, once before class. For online class participants, a link was provided to an electronic form where the participants filled out the surveys.

Once participants were educated about the study and verbally gave consent, they were given a survey packet. Each page within the packet was labeled with a random three-digit number to track scores across each administration time. For those who completed the online course, a link in the chat box of the meeting platform was provided for access to the surveys. The online surveys asked participants for a pet name on the before and after surveys for tracking purposes. Instructions on how to take the survey were located at the top of each anxiety survey. Completion of the surveys was considered consent to participate in the study.

The raw data from the anxiety survey was scored and demographic data was entered into an Excel spreadsheet. Only the PI's password protected computer was used to record and store data, this information was sent to the PI's facility email address as a backup and was encrypted. This email address can only be accessed from a facility owned computer. None of the forms or Excel sheet have any patient identifiers.

Data Analysis Plan

The data was analyzed using IBM Statistical Package for the Social Sciences Statistics, version 26 (IBM Corp., Armonk, New York, USA).

Analyzing Qualitative Question

The responses from the open-ended question were evaluated and categorized. The PI reviewed each answer carefully with several readings of the responses to generate main themes. These themes were narratively described.

Reliability and Validity Analyses

Although further reliable and valid testing for the STAI is not necessary, Cronbach's alpha was re-run to estimate internal consistency with our patient sample which resulted α=0.828.

Hypothesis Testing

Hypothesis testing helped determine any correlation between the interventional class and anxiety levels at different points in time and with different clinical factors. The level of significance was set at .05 for all analyses. A paired t-test was used to compare the state anxiety score before and after the intervention to determine any change. Additionally, independent t-tests were used to determine any correlation of the state anxiety change scores within the different length of stays and types of surgery. Clinical factors were combined to provide better analysis.

Ethical Considerations

No patient identifiers were collected and only the PI administered, collected, and entered the data. The PI's computer is locked and secured by a case sensitive password providing privacy. Confidentiality was maintained by limiting connections with the patients and the completed surveys. Completed surveys were kept in an envelope and remained at the facility in an on-site locked office. Participants received the educational information and received medical care regardless of their participation in the study.

Results

Sample Characteristics

This sample size for this project was 20 participants (Table 1). The majority of participants were 40-69 years (*n* = 13, 65%), racially white (*n* = 18, 90%), and were women (*n* = 19, 95%). The most common type of surgery involved the endocrine system (*n* = 15, 75%) followed by gastrointestinal and other (*n* = 4, 10%), and one participant had urinary/gynecology

surgery (5%). Participants generally had some college education (n = 7, 35%) or a completed bachelor's degree or higher (n = 11, 55%). The distance in which the participants were traveling to our facility was more even; half of the participants live within the city limits or in the metro area. Whereas, the other half of participants live within the state or Rocky Mountain region. Finally, the anticipated length of stay was primarily a one-night admission (n = 13, 65%), followed by unknown length of stay (n = 4, 20%), same day surgery (n = 2, 10%), and two or more nights (n = 1, 5%).

State Anxiety Inventory

A paired t-test was conducted to compare the anxiety levels before and after class. The average state anxiety score for all participants before the interventional class was 41.85 (SD = 11.64). Whereas, the average state anxiety score after the intervention was 34.85 (SD = 10.08). Anxiety level decreased significantly after the educational class, t (19) = 3.75, $p < .001$.

Due to the limited sample size some clinical categories were combined for analysis; gastrointestinal, urinary, and gynecology surgeries were combined, as well as, same-day, two or more nights, and unknown lengths of stay. Among patients who were scheduled for endocrine surgeries (n = 15), the mean anxiety level decreased from M = 39.47 (SD = 11.750) before the intervention to M = 32.07 (SD = 8.66) after the intervention. For all other types of surgery (n = 5), the mean anxiety level decreased from M = 49 (SD = 8.69) to M = 43.2 (SD = 10.18). Anxiety levels for those participants who expected a one-night length of stay (n = 13) decreased from M = 39 (SD = 11.68) before the intervention to M = 33.54 (SD = 11.03) after the intervention. The anxiety levels among patients anticipating all other lengths of stay (n = 7) also decreased from M = 47.14 (SD = 10.29) to M = 37.29 (SD = 8.24).

Independent t-tests were completed to assess differences in anxiety change for different lengths of stay and the type of surgery (Table 2). The change in mean anxiety score for anticipated one-night admission was 6.23 (*SD* = 6.76) whereas, all other lengths of stay had a change in anxiety score mean of 9.85 (*SD* = 9.3). However, there was no significant difference in the change of anxiety level from pre to post educational intervention by the anticipated length of stay. For endocrine surgical participants, the mean state anxiety score decreased by 8.07 (*SD* = 8.1) whereas, for all other surgeries, the mean decreased by 5.8 (*SD* = 6.87). Also, there was no significant difference in the change of anxiety level from pre to post educational intervention by type of surgery.

Open-ended Feedback

Investigators analyzed all responses to open-ended questions over several readings to reveal three overarching themes: a sense of preparedness, confidence, and a decrease in anxiety.

Sense of Preparedness

The most frequent comments were related to patients' sense of preparedness for their upcoming surgical procedures. The pre-operative patient educational class made the unknown more visible and familiar, assisting patients in understanding what to expect and preparing mentally for their procedures. As one participant noted, "I have a much better understand of what to expect while I'm at the hospital." Another participant stated that, "It gave me information which persuaded me that the experience is well planned for to keep me safe and comfortable. I feel more prepared." While medical history was not collected, some participants had existing knowledge from their previous healthcare experiences. As shared by another participant, "I was pretty much already aware of most of it, but I very much appreciate the preparatory information. I think it is very useful."

Confidence

Participants' responses showed that the educational class had a positive impact on their ability to retain information after discharge. For example, one participant stated: "This will help me remember all the fine details without being inundated with gobs of info on day of surgery." Also, participants' responses reinforced the positive impact of the educational class had on their ability and self-confidence to care for themselves. One participant comment said: "It answered many questions and gave me some relief and more confidence." Interestingly, the education may have also improved patients' perceptions of the healthcare team, as reflected in this comment: "It helped very much for more confidence in my surgeon."

Decrease of Anxiety

While most of the comments reflected a decrease of anxiety some expressed this more than others. For example, one participant stated that, "Understanding exactly what will be done during my visit as well as answering any questions and easing any worries." Other comments ranged from feelings about the class to personal self-talk, for example, "It was helpful", and "Relax".

Discussion

This study focused on anxiety levels in general surgical patients before and after an educational intervention. It was anticipated that classes would be offered in a group setting; however, low enrollment created a need for other instructional modalities, including online and one-on-one in-person sessions. This finding highlights a need to offer pre-surgical education in multiple formats to meet the needs of diverse patients.

Anxiety Levels

Consistent with the literature, this study found that nurse-delivered education that discussed what to expect pre- and post-operatively contributed to a decrease of anxiety levels among surgery patients. Studies by Amini et al. (2018) and Sadati et al. (2013) both showed a decrease in anxiety in 160 patients ($p < .001$ and $p < .05$, respectively) using similar educational content, such as pre- and post-operative instructions, taught by nursing staff. Other studies reported a decrease in anxiety when nursing staff conducted education that focused on other topics like pain management and diagnosis and treatment before and after surgery (Lin and Wang, 2005; O'Connor et al., 2014). While our educational intervention did not cover diagnosis or treatment of ailments requiring surgery, it did discuss pain scales and pain management techniques. This may have helped reduce pre-operative patients' anxiety levels related to anticipated pain.

The method of education delivery may also impact anxiety levels. This study used different modes of communication including verbal, written, and visuals, delivered in-person or online. As discussed in the literature review, when nurses provided patients with verbal and written information about their surgeries, anxiety levels decreased. It is noteworthy that some prior studies that used other educational methodologies including video, website, or booklet did not find reductions in anxiety, despite having adequate sample sizes (Gezer & Aslan, 2019, $n = 62$, $t = 1.32$, $p = 0.197$) (Hering et al., 2005, $n = 64$, $p = 0.055$) (Kakinuma et al., 2011, $n = 211$, $p = 0.64$) (Salzwedel et al., 2008, $n = 209$, p = not reported). One study involving cardiac patients found a larger decrease of anxiety from verbal education when compared to usual care in written format (Harkness et al., 2003). Our results along with these findings highlight a need for additional research related to the relative impacts of different communication and delivery modalities on patient anxiety.

Type of Surgery and Expected Length of Stay

This study examined whether the impact of education on anxiety would vary based on type of surgery and expected length of stay. Convenience sampling influenced the types of surgeries we were able to include within our patient population. The physician who allowed us to conduct classes in their office was an endocrine surgeon who specializes in thyroid and parathyroid glands, thus, the majority of participants reported they were having surgery on their endocrine system.

Although the average anxiety levels within all surgical types decreased significantly over time in relation to the intervention, but there was no significant difference between types of surgery, suggesting that the type of surgery did not influence the change in patients' anxiety levels. The endocrine participants in our study had lower anxiety levels at baseline compared to other types of surgery. According to Caumo et al. (2001), thyroidectomy surgery is a minor procedure and these patients have less anxiety than patients undergoing medium-level surgeries including hysterectomies, transurethral prostate or bladder resections, and mastectomies. It is theorized that loss of body components and function, as in hysterectomy and mastectomy surgeries, causes higher anxiety levels rather than the complexity of the surgery (Caumo et al., 2001; Yilmaz et al., 2011). The other types of surgery examined in this study (i.e., gastrointestinal, urinary, and gynecology procedures) fall under the medium surgical level as defined by Caumo et al. (2001). This may explain the higher baseline anxiety level among patients in this group. Additionally, another study of thyroidectomy patients found no change in anxiety levels when an educational intervention was used (Gezer & Arslan, 2019). This may indicate that pre-operative education to reduce anxiety is less important for thyroidectomy patients than for those experiencing higher levels of surgery.

Anticipated length of stay was analyzed to determine whether this influenced anxiety level. Overall, the mean anxiety levels decreased significantly across the different lengths of stay; however, the change in anxiety scores was not significantly different between one night and other length expected length of stay. The length of stay group of two or more nights, unknown length of stay, and same-day surgeries had higher mean anxiety levels at baseline compared to the one-night length of stay group. At our facility, parathyroid and thyroid surgical patients are usually admitted for one night for observation, which could account for the majority of our sample anticipating a one-night length of stay. Again, since thyroidectomies are considered a minor procedure, this may account for the lower anxiety levels compared to the other lengths of stay (Caumo et al., 2001). Same-day surgical patients often have other concerns, such as, finding transportation to and from the facility and limited admission and pre-operative time at the facility which could contribute to an increase of anxiety (Wetsch et al., 2010). Conversely, a length of stay of 2 or more nights could be related to a major surgery, such as, a laparoscopic colectomy procedure which typically has a length of stay of 3.7 days (Cavallaro et al., 2018). A planned longer length of stay could account for a higher anxiety level. Also, some participants did not know their anticipated length of stay, and this lack of knowledge could have caused an increase in anxiety prior to the educational class. Finally, it is hard to anticipate if the anxiety is related to length of stay or type of surgery.

Patients' Thoughts

The perspective of patients who received pre-surgical education revealed additional information about the influence of pre-surgical education on anxiety levels. Our findings related to the positive impact of education on patients' preparedness, confidence, and anxiety reduction were similar to previous research. There is evidence that nurse- delivered verbal education helps

surgery patients feel more secure about the process and also helps to increase patients' self-responsibility and participation of their care (Aasa et al., 2013). The patient comment regarding improved confidence in the surgeon was unexpected. The relationship between patient and surgeon has a lot to do with feelings of trust and vulnerability (Axelrod & Goold, 2000). Pre-operative education may help in shared decision-making creating trust and improved quality of care within the healthcare team (Boss et al, 2016).

Limitations

There are several limitations acknowledged in this study. The sample size was small and included only one facility, so our findings are not generalizable to all pre-operative patients. In addition, this study focused on patients undergoing a surgical procedure for gastrointestinal, gynecological, urinary, endocrine, or other cancer related processes, and a large majority of those participants were having endocrine surgeries. Further study on the different types of surgery and its effect on anxiety levels may help to generalize our results to other patient populations.

Even with different classroom formats and different days of the week and times, patient attendance was poor. This could be related to the decreased number of surgical procedures at the facility. One explanation for this is the national trend of more same-day surgeries and an increase of surgical centers (The Leapfrog Group, 2019). The need to deliver the education at different times and methodologies to different patients also introduces the possibility that the education may not have been consistent for all participants. This limitation was minimized by having the same nurse deliver the education to all groups using the same set of educational materials.

Implications/Recommendations

Patients are spending less time in the hospital and are expected, in the future, to have more comorbidities. Patients need pre-operative education to help reduce anxiety and promote

positive patient outcomes. While providers' time is occupied with current patient loads due the nursing and physician shortage, higher anxiety levels in pre-operative patients can have negative ramifications for both the surgery and recovery periods. Delivering patient education prior to admission could lessen these factors. While development and delivery of pre-surgical education requires time and resources, reduced patient anxiety may lead to higher levels of patient satisfaction with less risk of complications and/or shorter lengths of stay, which can help to offset this investment.

Additional research would be helpful in adding to the nursing knowledge about the relationship between education and the adult surgical experience. This project only surveyed patients and not family members, who often attended with the patient. Their viewpoints could give further insight into the family's experience. Furthermore, this study used a brief evaluation tool, and a longer survey or personal interviews might reveal more detailed information about the factors associated with pre-operative education and its effects on anxiety. While recruitment challenges did not enable us to evaluate patient education delivered in a classroom environment, the delivery of education to groups rather than individual patients may provide a good avenue for nursing staff who have limited time and resources. Additionally, evaluating the effects of self-efficacy and/or health literacy, may provide clarity on the effectiveness of pre-operative patient education. Finally, one additional consideration for future research is the timing of the educational class within the pre-operative timeframe. Since our participants could attend class any time before the surgical day, it is unknown if the timing of the intervention affected anxiety levels.

It is unclear if the method of delivery had any influence on decreased anxiety levels in this study. The online delivery method has not been studied in the context of educating general

surgical patients. With the increase of telemedicine, electronic modalities may become more commonplace within patient education and support. Delivering pre-surgical education in both face-to-face and online formats may be the best way to reach the broadest population of surgery patients. Additional research is needed to determine the impacts of different education delivery modalities on patient satisfaction with, and the effectiveness of, pre-surgery patient education.

Sustainability

Given the current climate of limited nursing time and resources, several steps need to be taken to facilitate the long-term success of this program in a small, urban hospital. First, it will be important to explore methods and approaches to boost class attendance. Patient attendance was low until classes were conducted in a clinical office with office staff encouraging patients to attend immediately following pre-operative visits. Second, strong physician buy-in and leadership is paramount to sustaining a pre-operative educational program in the acute care setting. For example, orthopedic and bariatric surgeons at the facility require patients to attend pre-operative classes conducted by nurses and physician assistants, leading to positive patient outcomes and preparedness. A similar requirement for general surgery patients would help to overcome the challenges with patient attendance. Finally, a push to establish pre-operative patient education as a standard of practice would help to solidify long-term success.

Conclusion

The results of this study suggest that education for adult general surgical patients during the pre-operative period can decrease anxiety levels. The qualitative outcomes suggest positive perceptions about the education, including increased feelings of preparedness and confidence. A decrease in anxiety in surgical patients could improve patient self-efficacy and outcomes.

Leadership support of pre-surgery education will be important to realizing these potential benefits.

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Table 1

Patient Characteristics

	Frequency (%) *n=20*
Age in years	
18-39	2 (10%)
40-69	13 (65%)
70+	5 (25%)
Gender	
Male	1 (5%)
Female	19 (95%)
Race	
Hispanic	1 (5%)
White	18 (90%)
Other	1 (5%)
Education level	
Some high school	1 (5%)
Completed high school or equivalent	1 (5%)
Some college	7 (35%)
Completed bachelor's degree or higher	11 (55%)
Distance between facility and patient's residence	
Within city limits	4 (20%)
Within the metro area	6 (30%)
Outside the metro area, in-state	8 (40%)
Outside of the state within the Rocky Mountain region	2 (10%)
Type of surgery	
Endocrinology	15 (75%)
Gastrointestinal	2 (10%)
Urinary & Gynecology	1 (5%)
Other	2 (10%)
Length of Stay	
1 night	13 (65%)
2 or more night	1 (5%)
Same day surgery	2 (10%)
Not sure	4 (20%)

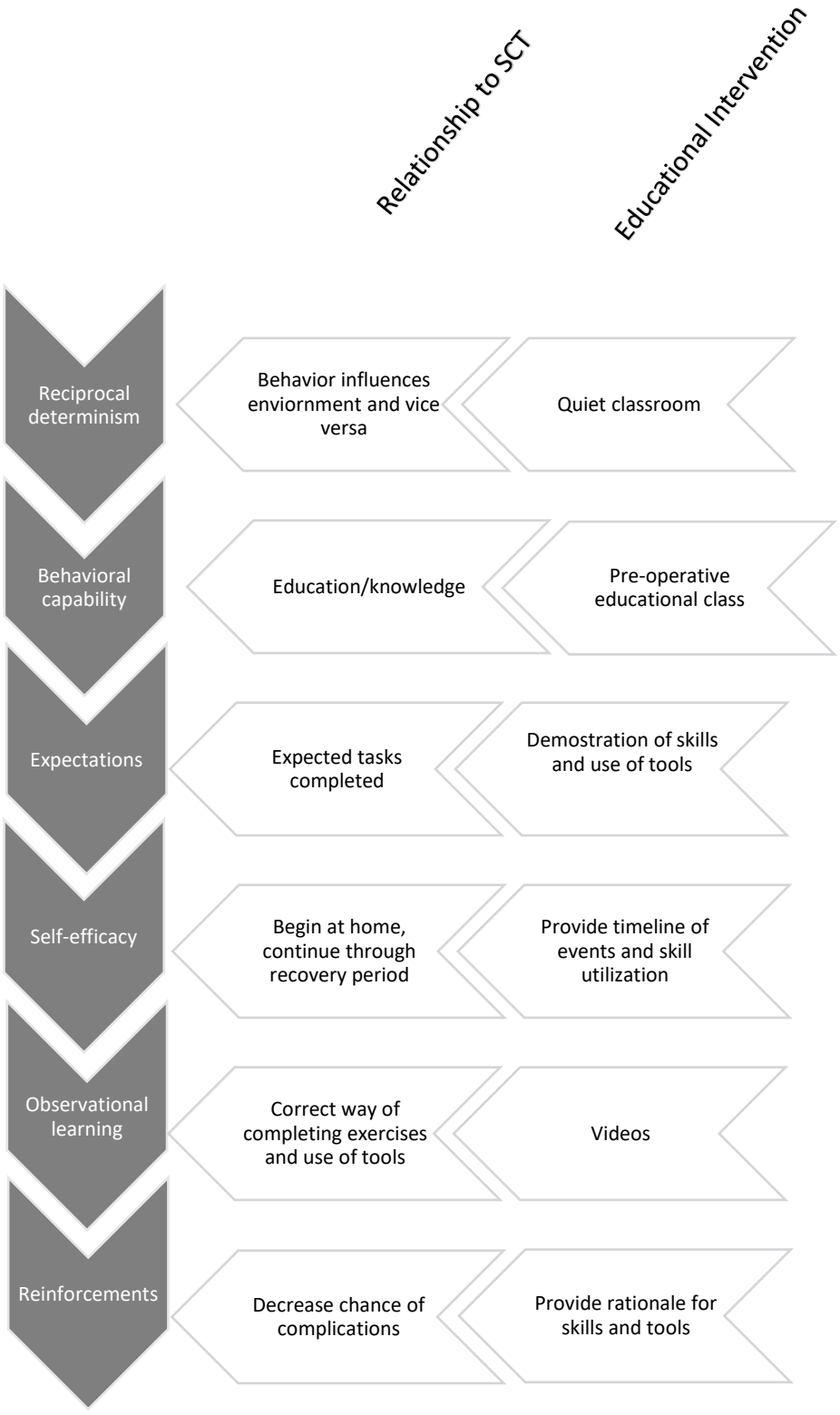
Table 2

Change in State Anxiety Scores by Clinical Factors

	n	Mean decrease of change scores (SD)	F	Sig.	t (df)	p
Expected Length of Stay						
1 night	13	6.23 (6.76)	1.255	0.277	-1.005 (18)	p = 0.328
All other lengths of stay	7	9.85 (9.3)				
Type of surgery						
Endocrinology	15	8.07 (8.1)	0.356	0.559	0.56 (18)	p = 0.583
All other types of surgery	5	5.8 (6.87)				

Figure 1

Social Cognitive Theory



Appendix A

Pre-Operative Class Flyer

Pre-Operative Patient Education Class

Coming to ABC Medical Center for surgery*?

Knowing what to expect when you're facing surgery is very important for your recovery! That's why the ABC Surgical team offers pre-operative classes for care of the general surgery patient and their families.

- How to prepare for surgery
- What to expect on your day of surgery, from arrival to discharge
- What to expect as you recover
- Learn about exercises and rehabilitation

**If you are having joint replacement or spine surgery, please take a dedicated ABC Orthopedic & Spine Center pre-surgical class. Visit http://ABCMedicalCenter.com/pre-op-joint-class for more.*

Family and friends welcome to join! No RSVP needed.

Where: Conference Room

When: Class dates and times vary, check website for updated listings

Call the education office at 3**.3**.2*** for more information or questions.

Appendix B

Educational Learning Objectives of the Intervention

Instructional goal

After the educational session the adult learner/patient will be able to discuss what to expect and participate in their care by using tools and exercises to assist their surgical recovery during their hospitalization.

Terminal objective: When preparing for surgery, the patient will be able to describe what to expect before and after surgery including logistics, care protocols, and the use of interventional tools and exercises to decrease risks and complications during hospitalization.

Subordinate objectives:

1.1 The learner will be able to explain how and when interventional tools will be used during recovery and the rationale for using each tool. Intervention tools include: *Foundational Knowledge*

a. Incentive spirometer
b. Sequential compression devices (SCDs)
c. White boards
d. Pulse oximetry
e. Need for oxygen
f. Pain scale/management

1.2 The patient will be able to explain how and when interventional exercises will be used during recovery and the rational for using each exercise. Interventional exercises include: *Foundational Knowledge*

a. Frequent ambulation – call don't fall

b. Cough/deep breath – splinting

c. Generalized incision care

d. Wash hands

1.3 The patient will be able to recall information about their plan of care and safety including:

a. Hospital information - visiting hours, cafeteria location, coffee, Walgreens

b. Room service

c. Hourly nursing rounds

d. Shift change/bedside report

e. Lab draws (usually in the early morning)

f. Discharge goals

g. Discharge procedure

h. Physician orders rule – ie. diet, medications

1.4 When thinking about their upcoming surgery the patient will value the interventions for their healthy recovery. *Caring*

Terminal objective: When recovering on the acute care unit, the patient will demonstrate the use of interventions so that they remain complication free.

Subordinate objectives:

2.1 The patient will be able to demonstrate the correct use of interventional tools during the post-operative period. *Application*

a. Incentive spirometer

b. Sequential compression devices (SCDs)

c. White boards

d. Pulse oximetry

e. Pain scale/management

2.2 The patient will be able to demonstrate the correct exercises during the post-operative period. *Application*

a. Frequent ambulation – call don't fall

b. Cough/deep breath – splinting

c. Generalized incision care

d. Wash hands

2.3 During their hospitalization the patient will value new knowledge to improve patient's outcomes. *Caring*

Appendix C

Smoking Cession Handout – From ACS's website

Quit Smoking Before Your Operation

Smoking increases your risk of problems during and after your operation. Quitting 4 to 6 weeks before your operation and staying smoke-free 4 weeks after it can decrease your rate of wound complications by 50 percent. Quitting permanently can add years to your life.

Your chance for a better recovery

Prepare for your Quit Day

As listed on the American Cancer Society website:

- Pick the date and mark it on your calendar.
- Tell friends and family about your Quit Day.
- Get rid of all the cigarettes and ashtrays in your home, car, and place of work.
- Stock up on oral substitutes (sugarless gum, carrot sticks, hard candy, cinnamon sticks, coffee stirrers, straws, and/or toothpicks).
- Decide on a plan. Will you use nicotine replacement therapy (NRT) or other medicines? Will you attend a stop-smoking class? If so, sign up now.
- Practice saying, "No thank you, I don't smoke."
- Set up a support system, which could be a group program such as Nicotine Anonymous or a friend or family member who has successfully quit. Ask family and friends who still smoke not to smoke around you or leave cigarettes out where you can see them.

- If you are using bupropion or varenicline, take your dose each day of the week leading up to your Quit Day.
- Think back to your past attempts to quit. Try to figure out what worked and what did not work for you.

Download a Quit Smoking Plan and "I Can Quit" Log

Dealing with Withdrawal

Nicotine replacement and other medicines can help reduce many of the physical symptoms of withdrawal. Most smokers find that the bigger challenge is the mental part of quitting. If you have been smoking for any length of time, smoking has become linked with nearly everything you do—waking up in the morning, eating, and drinking coffee. It will take time to “un-link” smoking from these activities, which is why, even if you are using a nicotine replacement, you may still have strong urges to smoke.

RESOURCES TO HELP YOU QUIT

Talk to your health care provider about the best option to help you with quitting, but know how truly important it is that you quit before your operation.

The National Alliance for Tobacco Cessation provides the latest information on how to quit smoking with its program called “Become an EX.” Proven methods to teach smokers how to quit and stay quit are provided.

The American Lung Association has information and plans like its “Freedom from Smoking” program, an online program that takes you through modules and provides you with the tools you need to quit.

The American Cancer Society has helpful detailed information and a hotline number on its website. Call the American Cancer Society at 1-800-227-2345 or visit this site.

Extensive help resources from government and professional associations offering quit help.

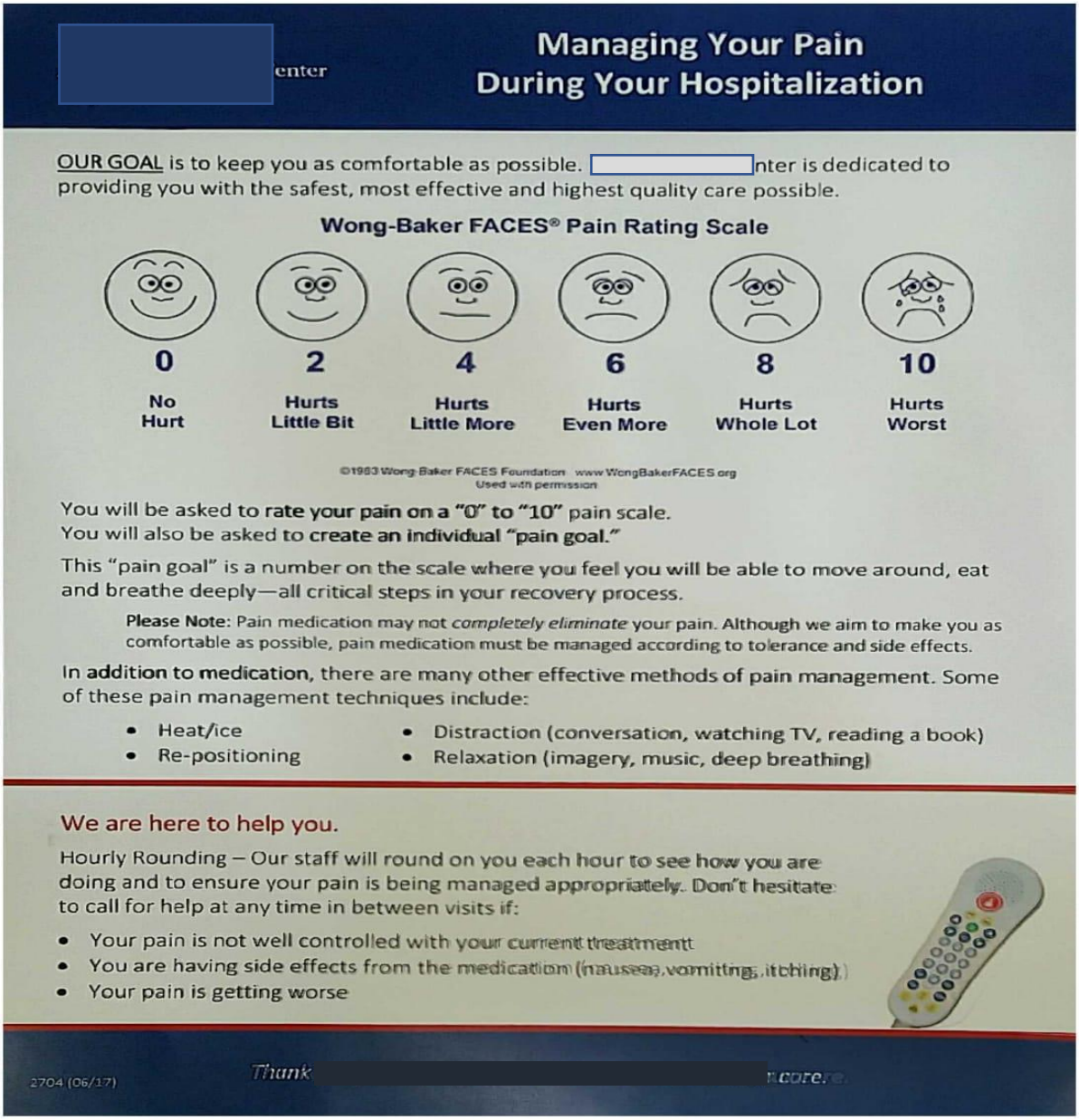
www.CDC.gov/tobacco

Support by phone or Internet including “talk to an expert.”

www.smokefree.gov

Appendix D

Pain Management Handout



enter

Managing Your Pain During Your Hospitalization

OUR GOAL is to keep you as comfortable as possible. [redacted]nter is dedicated to providing you with the safest, most effective and highest quality care possible.

Wong-Baker FACES® Pain Rating Scale

0	2	4	6	8	10
No Hurt	Hurts Little Bit	Hurts Little More	Hurts Even More	Hurts Whole Lot	Hurts Worst

You will be asked to **rate your pain on a "0" to "10"** pain scale.
You will also be asked to **create an individual "pain goal."**

This "pain goal" is a number on the scale where you feel you will be able to move around, eat and breathe deeply—all critical steps in your recovery process.

Please Note: Pain medication may not *completely eliminate* your pain. Although we aim to make you as comfortable as possible, pain medication must be managed according to tolerance and side effects.

In **addition to medication,** there are many other effective methods of pain management. Some of these pain management techniques include:

- Heat/ice
- Re-positioning
- Distraction (conversation, watching TV, reading a book)
- Relaxation (imagery, music, deep breathing)

We are here to help you.

Hourly Rounding – Our staff will round on you each hour to see how you are doing and to ensure your pain is being managed appropriately. Don't hesitate to call for help at any time in between visits if:

- Your pain is not well controlled with your current treatment
- You are having side effects from the medication (nausea, vomiting, itching)
- Your pain is getting worse

2704 (06/17) Thank [redacted]core.

f

Appendix E

Demographic Survey

Thank you for participating in this research study. A few demographic questions.

Age	☐ 18-39 years ☐ 40-69 years ☐ 70+ years
Gender	☐ Male ☐ Female
Highest level of completed education	☐ Some high school ☐ High School Diploma or equivalent ☐ Some College ☐ Bachelor's degree or higher
Race	☐ African American ☐ Hispanic ☐ White ☐ Other
Your place of residence	☐ Within the city limits ☐ Within the metro area ☐ In-state ☐ Rocky Mountain region

Which body system are you having surgery on?	☐ Endocrine ☐ Gastrointestinal ☐ Urinary or Gynecology ☐ Other_____
How many nights are you expected to be hospitalized?	☐ One night ☐ Two or more nights ☐ Same day surgery ☐ Not sure

Appendix F

Information Sheet

INFORMATION SHEET FOR PARTICIPATION IN A RESEARCH STUDY

Title: A Nurse Led Pre-Operative Patient Education Intervention and its Effect on Anxiety Levels in General Surgical Patients

Principal Investigator: Elisabet Harms, RN

Site: [redacted]

Purpose: You have been asked to participate in this study because you are planning to have surgery at [redacted]. This study should only take 10-20 minutes of your time. Your participation in this study is entirely voluntary. You should read the information below, and ask questions about anything you do not understand, before deciding whether or not to participate.

Procedures: If you volunteer to participate in this study, we would ask you to do the following things:

1. Attend a pre-operative educational class at [redacted] or an online video conference.
2. Complete a brief survey and questionnaire before the start of the educational class.
3. Complete a brief survey at the end of the educational class.

*Each survey should take 5-10 minutes of your time.

Voluntary Participation: Your participation in this research is VOLUNTARY. If you choose not to participate, it will not affect your relationship with [redacted] or your right to health care or other services to which you are otherwise entitled. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without prejudice

to your future care at [redacted]. Additionally, you will receive the patient education regardless of your decision to participate.

Risks and Benefits: There are no anticipated psychological, social, legal, or financial risks that might result from participating in this study. Based on other research with this kind of patient education in other surgical areas, researchers believe it is beneficial to patients planning to have surgery. Of course, because individuals respond differently to therapy, no one can know in advance if it will be helpful in your particular case. This research is not being done to improve your condition or health. This study will benefit the future care of patients at [redacted]. It will assist the nursing staff and nursing research to gain further insight to patient surgical experiences. It will help nursing educators understand the best modality of patient education in the general surgical patient.

Confidentiality Protections: The only people who will know that you are a research subject is the primary investigator and, if appropriate, your physicians and nurses. No information about you, or provided by you, during the research will be disclosed to others without your written permission, except: if necessary to protect your rights and welfare (for example, if you are injured and need emergency care) or to respond to threats that you make to harm yourself or others. Only these agencies have the right to look at your data: the HCA-HealthONE Institutional Review Board.

Financial Obligation:

There will be no cost to you or to your insurance company if you participate in this study.

Contact Persons:

Please contact research staff if you have any questions:

Elisabet Harms, RN – Primary Investigator

[redacted]

[redacted]

[redacted]

If you have questions regarding your rights as a research subject, you may contact the HCA-HealthONE Institutional Review Board (IRB) Administrative Office at 303-584-2300.