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Reducing the Surgical Patient's Family Member's Anxiety Using an Electronic Patient Tracking Board

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Abstract

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MSN, University of Phoenix, 2010

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Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctorate of Nursing Practice

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Abstract

Family members of surgical patients experience anxiety due to lack of consistent communication during the surgical process. Attending to the needs of the surgical patient's family members is an important factor easily forgotten in a busy clinical arena. The purpose of this project was to decrease the surgical patient's family member's anxiety by providing family members with timely and consistent information regarding the patient's progress through surgery. The theoretical foundation used was general systems theory showing that a change in one part of a system leads to change in the whole system with the use of improved communication and feedback. The key question asked was whether an electronic information system could provide additional information in conjunction with personal interaction to reduce the family member's anxiety. The project design was a prospective, randomized, posttest design in a single-center study using the State-Trait Anxiety Inventory Survey for Adults (STAI). The sample size was 80 surgical patients' family members. Results using the Wilcoxon-Rank-Sum test indicated that the addition of an electronic information display was unable to reduce STAI scores. The medians for the State portion of the survey were .823 across all categories for both the control and intervention groups. The medians for the Trait portion of the survey for both the control and intervention groups were .118 with p >05. Although the data suggests retaining the null hypothesis, a significant social change was the staff's heightened awareness of the surgical patient's family's vulnerability and the need for communication during the perioperative phase.

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Section 1: Overview of the Evidence Based Project

Introduction

The surgical waiting room can be an area of uncertainty, stress, and frustration. The hospital staff views surgery and its components as a nonthreatening, everyday occurrence. However, the surgical environment is unfamiliar for families and creates an atmosphere of fear and anxiety. Insufficient information is the cause of surgical waiting room uncertainty. Notifying the surgical patient's family member of the patient's progress is significant because the delay of information increases the family member's anxiety. Anxiety translates to decreased family member satisfaction and increased frustration (Muldoon, Cheng, Vish, DeJong, & Adams, 2011). Leske (1996) suggested that the waiting period during surgery is the time when anxiety is the highest for family members. Leske found that family members who received intraoperative reports were less anxious than those who did not receive reports. This project included consistent surgical patient information provided at regular intervals using an electronic patient tracking board to decrease the surgical patient's family member's anxiety.

One of the challenges in communication is consistency (Nursing, 2008). MacDonald, Latimer, and Drisdelle (2006) surveyed what was helpful to families while their relative was in surgery. Communication was at the top of the list. MacDonald et al. discovered that a surgical liaison nurse provided the necessary information and acted as a support mechanism for the surgical patient's family to decrease anxiety. Researchers in the University of Virginia Health System (as cited in Nursing, 2008) found that updating a patient's family members every 2 hours with a phone call provided comfort. Adopting

and sustaining a new procedure is necessary for success (Titler, 2010). According to Titler (2010), use of the translating research into practice (TRIP) strategy is necessary. he nature of innovation and proactive leadership will help to entice users to make a change. End users need to see the befit of the intervention put into practice. In an increasingly technological environment, the use of an electronic patient tracking board and a surgical waiting room volunteer may accomplish these same results (Surgical Information Systems, 2013).

A general theme I discovered was dissatisfaction with information provided to family members regarding the patient's surgical experience. Frequently, patients' families are not notified of surgical delays, incision time, and surgery end time. At my facility, there is a volunteer in the waiting room who provides information to families, but this does not occur consistently. Currently, the volunteer calls the main desk for an update, which is discouraged due to the high volume of calls at the operating room desk. If asked, the volunteer will seek information for the family. The operating room nurses become busy and often forget to update the patient's family. There is also a phone in the surgical waiting area for patient family members, with two numbers to call for information. The problem is that these numbers connect to direct care nurses who may be too busy to answer the phone at that time, leading to further family member frustration. Surgical patient family members' anxiety may lead to patient dissatisfaction, which is an important quality indicator (Kelly, 2011). Improving communication with family members may reduce their anxiety, which in turn may increase patient satisfaction (Kelly, 2011).

In this project I evaluated whether adding an electronic communication device to the surgical waiting room decreased the surgical patient's family member's anxiety. The intervention consisted of adding an electronic patient tracking board to the surgical waiting room. The goal was to reduce the surgical patient's family member's anxiety. According to Leske (1996), reducing the family member's anxiety may also reduce the patient's anxiety. Implementing consistent communication of patient information by using the electronic patient tracking board may reduce anxiety more effectively than the current method of the volunteer providing information to the family. A study by Leske (1996), who looked at surgical patients' family members' anxiety levels, will be used as the basis for this study by substituting the electronic tracking board as the source of patient family information.

The technological innovation of the electronic patient tracking board, supportive leadership, and potential reduction of family-member anxiety encouraged surgical staff members to make a change in communication to the surgical patient's family members. End users needed to see the benefit of the intervention to set new interventions such as the electronic patient tracking board into practice (White & Dudley-Brown, 2012). According to Leske (1996), family members' anxiety can be transferred to the patient. Therefore, improving communication of information may reduce anxiety in the surgical patient and family members.

Problem Statement

The surgical patient's family members do not receive patient information in a timely and consistent manner, which leads to anxiety, frustration, and decreased

satisfaction (Campbell, 2012). Current evidence indicates that family members' greatest need is timely information regarding the patient's surgical progress (MacDonald, Latimer, & Drisdelle, 2006). Receiving information impacts the family member's perception of care (Kynoch & Chang, 2011). According to Muldoon et al. (2011), anxiety can increase in family members if information is not provided. Incomplete information leads to heightened emotions and the inability to think clearly and ask appropriate questions. Chen, Miller, Jiang, and Klein (2005) suggested that the greatest threat to the success of any information system is a failure to communicate effectively. Lerman, Itzik, and Nurit (2011) indicated that information needs to be communicated to the surgical patient's family members to help them deal with stress, emotions, anxiety, and feelings of uncertainty. The electronic patient tracking board would provide a tool that could keep family members updated on the surgical patient's perioperative development. The electronic patient tracking board is a wall-mounted 52-inch high-definition screen where patient data is displayed using a unique patient identifier. The family receives a patient identifier at the time of admission to outpatient surgery. The family tracks the patient identifier on the screen to see their family member's surgical location (Surgical Information Systems, 2013).

Notifying the surgical patient's family member is important because the delay of information may increase the family member's anxiety. Anxiety translates to decreased satisfaction, and increased frustration and stress (Muldoon et al., 2011).Delays in communication can be tied to clinical reasoning. Clinical reasoning or decision making plays a role in that an experienced nurse will use critical thinking skills and notify the

family whereas a novice nurse may be task oriented. Clinical reasoning differs according to nursing experience and specific knowledge, and novice nurses have a limited ability to identify patient clues (Banning, 2008). Banning (2008) used the label of heuristics that encompass informal thinking strategies or cognitive shortcuts to enable quick decision making.

Communication is linked to patient safety, satisfaction, and anxiety. Researchers have shown that good communication skills are imperative for ensuring improved patient outcomes and patient satisfaction (Lang, 2012). The Joint Commission (2014) has new standards for communication that are intended to ensure that health care providers communicate effectively with patients. The Joint Commission bases its actions on research that indicates an association between poor communication, negative health outcomes, and increased cost (Blackstone, Garrett, & Hasselkus, 2011). The use of the electronic patient tracking board may improve communication with surgical patient's family members and reduce their anxiety.

Purpose Statement

The purpose of this project was to determine whether the surgical patient's family member's anxiety was decreased by increasing communication in a timely and consistent manner using an electronic patient tracking board to update the surgical patient's family members of the patient's surgical progress (Surgical Information Systems, 2013).

Objective

The objectives were written using the specific, measurable, attainable, relevant, and time- bound (SMART) method (Kettner, Moroney, & Martin, 2011). The objectives of the project are the following:

1. To achieve a patient family anxiety score of less than or equal to 2 using the electronic patient tracking board intervention. This rating was calculated using the State-Trait Anxiety Inventory for Adults based on a score rating of 1-4.
2. To ensure seamless communication at regular intervals during patients' surgical experience as evidenced by decreased surgical patients' family members' anxiety scores. Improved communication was attempted by utilizing advanced technology to track the patient in real time using the electronic patient tracking board.

The intervention of the electronic patient tracking board was used to accomplish the objectives. The purpose of the project was to measure change in anxiety scores between the two groups: (a) volunteer only and (b) the volunteer plus electronic patient tracking board.

It was important for representative involvement in developing goals and objectives for the program because they provided the support, recognition, and sustainability of the program. Empowerment built stronger connections between the stakeholders and the end users (Compas et al., 2008). End users identified needs related to areas the program impacted. Having the staff involved in developing goals and objectives for the program empowered them to make changes that they deemed useful

and needed. Involving staff helped to develop a sense of connection and ownership of the program, which led to greater acceptance (Hodges & Videto, 2011).

One strategy for involving the staff in the design and adoption of the study and subsequent changes was the use of the precede-proceed model. According to this model, voluntary behavioral change is more likely to be adopted and supported. The premise is staff involvement drives sustained change. Asking staff about their perceptions of the problem and their goals for improvement strengthened the needs assessment (Hodges & Videto, 2011). Strategies used to navigate lack of interest were to have a clearly stated, multidisciplinary, leadership-driven approach to developing goals and objectives. A specific, clearly stated, and measurable goal was necessary for successful change. Involving staff who work in outpatient surgery and outlining the benefits of timely and consistent communication with family members helped to promote staff support. Staff took ownership and strove to succeed when they saw a benefit changing (Hodges & Videto, 2011). Implementing a project champion kept the group on task and provided feedback to stakeholders, which kept them interested in accepting and sustaining goals and objectives (Compass et al., 2008).

Significance to Practice

Waiting for family members during surgery produces anxiety. Unexpected delays, lack of communication, and a perception of isolation upset family members, producing a feeling of fear and anxiety (Muldoon et al., 2011). The Institute of Medicine (IOM), the American Association of Colleges of Nursing (AACN), and The Healthy People Initiative all view communication as an important aspect of patient- and family-centered

care. According to the (McAdam, 2012), anxiety and distress from some sources during a patient's hospitalization need to be identified and eliminated. According to the IOM (2011), the patient's perception of quality of care is dependent on the quality of interaction and communication with the health care team. The Healthy People Initiative (2013) supported the delivery of accurate health care information that is tailored and targeted for each specific patient. The use of the electronic patient tracking board and timely and consistent information is an option to keep family members updated on the patient's progress through the surgical experience. Stress can alter the family's ability to comprehend information or to ask appropriate questions and can cause them to act aggressively toward staff. Family members need to be free of stress and anxiety so that they can support the patient (Muldoon et al., 2011). Monitors placed in the surgical waiting room allow family members to track the progress of the patient. The family members can watch for changes on the board, thereby decreasing their anxiety (McKesson, 2008). Staff find it challenging to contact family members in a timely fashion. Decreased communication impacts the family's feelings of anxiety and stress. The electronic patient tracking board updates families immediately as changes occur (Vocera, n.d.). Data show that personal communication from a staff member was the most useful to family members. Other researchers have documented that psychoeducational interventions reduce family members' anxiety while waiting for the surgical patient. More research is needed to determine whether there are other effective ways of communicating with family members during their loved one's surgery (Leske,

1996). With the introduction of informatics in health care, there are more options available to improve communication.

Project Question

Does adding an electronic patient tracking board reduce the surgical patient's family member's anxiety by providing timely and consistent communication as compared to the current process of a volunteer to provide the information to family members?

Evidence-Based Significance of the Project

Selecting and defining the problem of increased anxiety and decreased satisfaction among the surgical patient's family members was the first step in designing an evidence-based intervention (Zaccagnini & White, 2011). Evidence as early as 1995 indicated a need for effective communication for the surgical patient's family members (Leske, 1995). Several researchers used different strategies for supplying information to the surgical patients' family members, but few addressed the electronic patient tracking board. In this project I introduced a different method of communication using the principles identified in previous studies (Sunrise Information Systems, 2013) . I sought to determine whether use of the electronic patient tracking board decreased the surgical patient's family member's anxiety. Positive results would allow for promoting use of an electronic patient tracking board as a change in practice. One of the reasons for disseminating research is to use the findings to improve practice. Publication enables sharing the results with others (Zaccagnini & White, 2011).

The Appraisal of Guidelines for Research and Evaluation (AGREE) model includes research information, clinical experience, and patient choice. The evidence-

based nursing practice allows for continuous improvement to patient care and outcomes (Zaccagnini & White, 2011). The AGREE model supports health promotion through systematic clinical guidelines that help the clinician make decisions. Successful implementation requires stakeholder involvement and a clearly defined plan. Different options are also clearly identified. The need for timely and consistent information for the surgical patient's family member is a problem improved through stakeholder engagement, commitment, and the electronic patient tracking board (AGREE Trust, 2009).

Assumptions

The primary assumption for this project were surgery is a source of anxiety for the surgical patient's family members, and family members have a need for decreased anxiety during the surgical experience. Another assumption was that family members could describe their anxiety in a questionnaire.

Limitations

Limitations of this study included the ability of family members to understand how to use the electronic patient tracking board. Another limitiation is the volunteer offering information so the family member does not use the electronic patient tracking board. And the last limitation would be the malfunction of the electronic patient tracking board. Limitations also included the nurses in each area accurately charting the time the patient arrived. If the nurse forgot to document patient arrival time, then the information would have been incorrect and the family members would have been in the waiting room wondering why there was a delay. For the electronic patient tracking board to be

accurate, the staff needed to be diligent in logging arrival times. Staff may not have engaged in the new process and may have found work-arounds that defeated the purpose of the electronic patient tracking board (Neau, 2012).

Summary

In the current health care environment, patient satisfaction, safety, and improved outcomes drive patient care. Family members are an important part of patient satisfaction. One of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) indicators asks how well the nurse communicated with the patient. The intention of HCAHPS is to improve the quality of health care (Center for Medicare and Medicaid Services 2013). One way this can be accomplished is through improved communication (Medicare, 2014). Anxiety can lead to decreased satisfaction. The use of the electronic patient tracking board, which allows family members to track progress of their loved one through surgical services, is a change to improve the current practice of communication. The electronic patient tracking board may provide timely and consistent information on the patient's progress through surgery while decreasing the surgical patient's family member's anxiety.

Section 2: Review of Scholarly Evidence

Introduction

The purpose of this project was to determine whether the surgical patient's family members' anxiety was decreased by increasing communication in a timely and consistent manner using an electronic patient tracking board to update the surgical patient's family members of the patient's surgical progress (Surgical Information Systems, 2013). Family members in the surgical waiting area are filled with uncertainty, stress, anxiety, and frustration. Notifying the surgical patient's family members of the patient's progress is significant because a delay of information increases the family members' anxiety (Muldoon et al., 2011).

Researchers addressed current tools for providing information to the surgical patient's family members. Researchers indicated success with the use of liaisons, telephone calls, and pagers AMAI, n.d.). However, there are no studies addressing the use of the electronic patient tracking board. In this section I review literature relevant to my study.

Literature Search Strategy

I searched current literature in peer-reviewed journals and manufacturer's information from 1990s to 2015 Various keyword combinations were used to find related articles on surgical patients' family members, surgical waiting rooms, anxiety, and communication. The used the words *surgical, family members, anxiety, waiting room, electronic information boards, communication, surgery, surgical waiting room*, and *patient satisfaction* to find appropriate articles. Most of the researchers described human

interactions between staff and family for communication updates. A gap exists between the human factor and technology. The databases for the published literature search included CINAHL, Medline, Walden Library, and PubMed. Unpublished literature included dissertation abstracts, manufacturers' websites, and conference proceedings. Approximately 100 articles were reviewed, and approximately 65 studies were relevant to this study. There were three articles that addressed the success of the electronic patient tracking board in different facilities without formal studies.

Specific Literature

Family members become anxious when they are not frequently updated regarding the patient's progress through surgery. Leske (1995) suggested that the time spent waiting for a surgical patient is the most anxiety-producing period during the surgical experience. According to an earlier study by Leske (1992), receiving progress reports intraoperatively resulted in decreased anxiety in family members. Anxiety was measured using mean arterial pressure and heart rate. Leske observed a significant difference with the mean anxiety level of 28.56 for the test group, who received in-person intraoperative progress reports. The control group, who did not receive intraoperative reports, showed a mean score of 43.42 for anxiety level. This study illustrates the need for consistent communication with the surgical patient's family members.

Muldoon et al. (2011), also evaluated family members' anxiety level. Their study indicated that consistent information provided to surgical patients' family members decreases anxiety. According to Muldoon et al., 73.1% of family members reported that an estimation of the time the surgery would last along with the introduction of the Family

Care Card greatly reduced their anxiety. This study also showed the need for consistent communication with the surgical patient's family members.

LaMontagne, Hepworth, Salisbury, and Riley (2003) investigated the attitudes of parents of children undergoing surgery. Parents reported that anxiety during their child's surgery was one of the hardest things to deal with. Reassurance and support during their child's surgery were important for dealing with stress. This study also supported Muldoon et al., (2011) that consistent communication with the surgical patient's family members would help to decrease their anxiety.

Researchers at the University of the Virginia Health System (2008) surveyed family members and also found that lack of consistent communication was a source of anxiety. Campbell (2012) verified lack of communication as a source of anxiety in an article outlining his experience of being in the surgical waiting room. Campbell supported the fact that family members become anxious when waiting for information regarding the surgical patient.

Gandolf (2012) identified a gap between actual waiting time and the individual's perception of waiting time. According to Gandolf, this gap needs to be reduced to decrease family members' anxiety. Gandolf also noted that unexplained wait time and anxiety made the wait feel longer. Patients' family members did not perceive the wait time during surgery to be as long when they received timely and consistent information regarding the surgical patient. Anxiety increased the longer the patients' family members felt they were without information. This study also supported the need for consistent and timely communication with the surgical patients' family members.

Kynoch and Chang (2011) showed that attending to the needs of the patient's family is important in all phases of care. The American Medical Informatics Association (AMIA, n.d.) noted that there was a major challenge in the surgical waiting room related to communicating with families. Staff noted that families in the waiting room experienced uncertainty as a result of insufficient patient information.

Raleigh et al. (2006) showed that a patient's significant others are more anxious than the patient. This anxiety could bring more feelings of stress to the patient. Family members of patients in the ICU displayed similar feelings of stress and anxiety. Raleigh et al. noted that staff might not be aware of the family member's needs. Myhren, Ekeberg, Langen, and Stokland (2003) agreed that communication with family members and staff awareness of the importance of communication were vital to decreasing family members' stress and anxiety. Staff were surprised that their communication with the family members of ICU patients helped to ease anxiety (Myhren et al., 2003).

Pillemer, Suitor, Henderson, and Meador (2003) investigated the communication between family members and staff in a nursing home. Educational sessions for both family members and staff centered on conflict-resolution techniques and effective communication. Prior to the educational intervention, relationships between staff and family members were stressful. Relationships between family members and staff improved after the intervention. The study took place in a nursing home, but findings be applied in other nursing environments.

Weeks (2000) supported the premise that the longer family members wait in the surgical waiting room, the more they worry and imagine the worst outcome. According to

Weeks, the attitude of family members affects the interaction between the family members and the patient, as they will be the primary caregivers. A patient's family members can feel isolation, timelessness, lack of support, and stress while waiting in the surgical waiting room. This could hinder the family member from asking appropriate questions to provide care for the patient.

All of the studies reviewed above support the need for timely and consistent information for the surgical patient's family members. The electronic tracking patient tracking board is an attempt to provide the surgical patient's family members with consistent information. It was my intention in this study to investigate whether the use of the electronic patient tracking board would be effective in decreasing the surgical patient's family members anxiety.

General Literature

Huang et al. (2006) explored the use of smartphones and mobile phones for communication with family members as a possible alternative to giving information to the surgical patient's family members. Reassuring family members through emotional support was another method discussed in the American Informatics Association (AMIA) study. This study showed support for an electronic solution to communication with surgical patients' family members.

Stone and Lammers (2012) showed that communication through staff and volunteers was another option to relieve uncertainty in the surgical patient's family members. This study heightened awareness of the importance of staff communication with surgical patients' family members. Family members rely on staff for communication

about the patient. Insufficient information often led to confused and upset family members. The solution was to provide accurate information to the family. Stone and Lammers reinforced the importance of timely and consistent information to reduce anxiety in the surgical patient's family members.

Topp, Walsh, and Sanford (1998) evaluated the effect of providing digital pagers to individuals who were waiting for surgical patients. Digital pagers provided the family with the security that they would not miss any information or meeting with the surgeon. Family members could reduce their stress and fear of the patient's death or complications in surgery by having the pager. According to Topp et al., the intervention in the surgical waiting room experience decreased family members' anxiety. Family members reported positive comments about receiving the pagers so they could leave the surgical waiting room. Topp et al. supported the use of technology to provide timely and consistent information for family members.

In a project by students at Cornell University (n.d.), the concept of waiting and its effects were analyzed. Findings suggested that the surgical waiting room was an emotional area producing stress for family members. Administrators at Cayuga Medical Center introduced strategies to support coping mechanisms such as the color of the room, furnishings, and technical equipment such as digital murals.

Foy et al. (2004) emphasized empowerment of family members to expect communication of their family member's progress. According to Foy et al.,(2004) developing a therapeutic relationship between the nurse, the patient, and the patient's family members, decreases barriers such as lack of communication. Foy et al. showed

that the human factor does play an important role in communication and decreasing anxiety.

Parikh (2013) supported the MD-Connect-Me application that allows the surgeon to text family members and friends while the patient is in surgery. Before the surgery, the patient signs up for this service, which provides family members and friends updates at regular intervals. Parikh supported the idea that electronics provided another means of updating the surgical patient's family members.

Several researchers explored the use of a nurse liaison to communicate information to the surgical patient family members (Lerman et al., 1994). The role of the nurse liaison was to provide information and help the family members cope with stress, anxiety, and feelings of uncertainty (Lerman et al., 1994). Staff at the University of Wisconsin Hospital developed a surgical waiting area communication program in which a registered nurse called the surgical waiting room after the incision was made and then every 2 hours (University of Wisconsin,n.d.). Both of these studies indicated the need for the human factor in communicating information related to the surgical patient and the creation of programs to improve these methods. The introduction of the electronic patient tracking board could be one possibility to improve communication.

Madigan, Donaghue, and Carpenter (1999) instituted a family liaison program to ensure communication with family members at regular intervals during their child's surgery. Regular intervals were not defined. Stefan (2010) discussed the relationship between a nurse liaison and less anxious family members. Stefan showed a way to

alleviate patients' fears and reassure loved ones. These studies were chosen to illustrate the need for consistent and timely information regarding the surgical patient.

Micheli, Curran-Campbell, and Connor (2010) endorsed a surgical liaison showing that clear, timely communication during the time a loved one is in surgery decreased family members' stress and anxiety. Morey-Pedersen (1994) found that trained volunteers created a comfortable and caring environment assisting family members while they waited for their loved ones in surgery. Staff at Jefferson Hospital (n.d.) used a surgical support nurse for updates on the surgical patient. Because the surgical support nurse conducted rounds on all of the surgical patient families and then went to the operating room for updates, the information was not current and could be up to an hour old. These studies indicated that using an electronic device to provide timely and consistent information may be a more effective strategy.

Armstrong and Ramirez (2006) endorsed automatic tracking board that provides real-time data based on the location of the patient. The patient wears a tag that is powered by a wireless Internet connection using positioning technology. Many uses of the electronic patient tracking board have been identified both in the emergency room and the operating room. The electronic patient tracking board decreases confusion regarding the status of the patient, improves patient safety, increases efficiency, and improves communication.

Electronic patient tracking boards have been implemented in several institutions such as Baptist Health System, St. Lukes Hospital, and the University of Washington Harborview Medical Center. Kenny (2013) reported that staff at Martin Memorial

Medical Center initiated a successful, color-coded system that tracks patients from pre-operation through recovery. Real-time information for surgical patients' family members can help to reduce their stress and anxiety (Kenny, 2013).

Communication of information preoperatively can reduce a patient's anxiety on the day of surgery. Preparing patients preoperatively will help to reduce psychological and physical problems (Hughes, 2002). Walker (2002) suggested that preoperative education and preparation will decrease patients' anxiety. Effective communication allows for the optimal care of the patient (Norgaard, 2012). Mangram, McCauley, Villarreal, and Berne (2005) also agreed that communication such as family rounding in a trauma unit increased information for families. Families felt positive having a consistent time each day to address their questions. Jacobowski, Girard, Mulder, and Ely (2010) showed that communication using a structured environment enhanced communication and increased family satisfaction. The study was done in the ICU, but the results can be applied in the surgical waiting area. This study provides support for improved communication.

Importance of communication for a patient, listed in Joint Commission National Patient Safety Goals, 2011, focused on patient safety and outcomes . The Joint Commission has new standards that ensure that health care providers communicate effectively with patients. Dingley, Daugherty, Derieg, and Persing (2008) supported improved communication stating that current research indicates that ineffective communication among health care professionals is one of the leading causes of medical errors and patient harm. Baker et al. (2012) found that understandable, complete, and

consistent information has been correlated with increased family satisfaction. Communication is important in health care to decrease risk and increase patient safety. Several studies have indicated that communication among health care personnel is essential for the safety of the patient (Piening, Haaijer-Ruskamp, deGraeff, Straus, & Mol, 2012). Lang (2012) explained that patient satisfaction is tied to Medicare reimbursement with communication being one of the skills being tracked. Sheehan (2005) showed that effective communication between the nurse and the patient is important in ensuring a positive outcome to the surgical experience. These goals for improved patient satisfaction and safety are accomplished through decreased anxiety and improved communication. Medland and Ferrans (1998) echoed this point in a study in the ICU that indicated the effectiveness of providing information to the patient's family in a consistent, structured manner. Grant and Hamilton (2006) also noted the importance of communication in decreasing stress and anxiety. In Grant and Hamilton's study, breast cancer patients were waiting for a phone call to implement their radiation or chemotherapy treatments. A phone call from the nurse explaining what they are waiting for and keeping them informed was enough to decrease their anxiety. These studies reinforced the positive impact of improved communication on the patient's experience.

Boyle, (2005), shows patient advocacy to be an important factor in the surgical experience. It is important that the patient, as well as the family, knows the commitment of the perioperative nurse during a time when the patient is under anesthesia and vulnerable. Benko, (2001) shows the importance of patient satisfaction through receiving an extra measure of care. Going the extra mile for patients providing excellent service is

key. Both of these studies focus on patient satisfaction through decreasing anxiety of the patient and the family member.

To date, this investigator found one article specific to the use of the electronic patient tracking board and the decrease of anxiety. This study will attempt to improve the missing information regarding the electronic patient tracking board and the effect on surgical patients' family member's anxiety.

Conceptual Model

The general systems theory provided the framework for exploring the proposed intervention of adding an electronic patient tracking board to the surgical waiting room to consistently update the surgical patients' family members. One of the guiding principles of this theory is that change in one part of the system leads to change in the whole system, and that information and feedback mechanisms between system parts are essential for system function. Equilibrium can be equated to patient family member anxiety. Decreased anxiety improves patient family member satisfaction. The general systems theory looks at input, which is the information received from the environment, throughput, which is the intervention that has been modified, output, that is the information collected as a result of the intervention, and feedback or the information received after the intervention has been sustained (McEwen & Willis, 2011). The relationship between what is being tested is uncovered. The focus is on investigating the effectiveness of an intervention (Sousa, Driessnack, & Mendes, 2007).

Summary

The major themes in the literature center on the importance of timely communication for the surgical patients' family members. Leske (1996) provided data that showed the surgical patients' family member's anxiety was less when consistent information was given during the perioperative phase. Different strategies were used in different facilities such as liaisons and electronics such as pagers. One facility had a nurse call the family member at regular intervals to decrease anxiety. Articles were written regarding the electronic patient tracking board, but there were not any studies that used the electronic patient tracking board as a new intervention. This study was conducted to display any difference in anxiety levels of the surgical patients' family members with the use of the electronic patient tracking board, With the use of the electronic medical record, many institutions will have the opportunity to use the electronic patient tracking board. This study offers an opportunity to fill the gap of information in this area. Determining ways to decrease the surgical patients' family member's anxiety is important to the researcher for improving patient satisfaction and providing quality patient care.

Section 3: Approach

Introduction

The purpose of this project was to determine whether the surgical patient's family member's anxiety was decreased by the use of an electronic patient tracking board to update the surgical patient's family members of the patient's surgical progress

Researchers have examined various tools for providing information to the surgical patient's family members.(Madigan et al., 2006). However, there are no studies specifically addressing use of the electronic patient tracking board. Researchers have shown improved communication with the use of liaisons, telephone calls, and pagers (Lerman et al., 2011). Use of the electronic patient tracking board may allow the surgical patient's family member to feel in control by having the ability to check the board on a regular basis.

Project Design

The research design chosen for the study was a prospective randomized study. I compared standard family communication via the volunteer with family communication via the volunteer plus the electronic patient tracking board for communicating with the family members.A family member of a patient presenting for surgery was randomly assigned to either the control group or intervention group. The control group received surgical patient information from the volunteer. The intervention group received information from the volunteer and the electronic patient tracking board.

I followed guidelines from www.random.org to randomize the family members to the control or intervention group. The study was terminated once 40 family members

were randomized in each group. A random sequence generator was used to randomize from 0 to 1. Zero was the control group, and one was the intervention group. The numbers were assigned to each of the eligible charts on a daily basis.

Power Analysis and Statistical Analysis

The power analysis determined for a difference between independent means in two equal groups required a sample size of 200 (alpha=0.05, beta=0.8, two-tailed, d=0.5). The assumption for the power analysis is that the results are normally distributed with equal variance. The calculations for the sample size were conducted using the *z* test. Power, effect size, and significance level were used to compute the sample size required to show significant results. The sample size was determined to be 100 participants in each group. I decided that a sample size of 200 per group would be used to reduce the risk of a Type II error. Due to a detected protocol error, only 80 subjects could be used out of the 400. The level of significance was based on the desired statistical power of .80 and a *p* value of 0.05. I used the Shapiro-Wilk test to determine that the data was not normally distributed.

Population and Sampling

The participants were family members who accompanied outpatient surgical patients on the day of surgery and were given the option of completing a survey. The sample size was determined to be 200 participants per group. Out of 400 participants, only 80 participants produced reliable data. There were 320 participants with skewed data due to study protocol violations.The volunteers gave all of the family members the unique patient identifiers and did not differentiate between the control and the

intervention computers. There were 40 participants in the control group and 40 participants in the intervention group. Approximately 20% of participants in the control group were older than 55 years of age, and 26% of participants in the intervention group were older than 55 years of age. Relationship to the patient included mother, father, sister, brother, daughter, son, or spouse in both groups. The greatest differences between relationships occurred for spouse in the control group at 47.5% and in the intervention group at 62.5%, and daughter at 15% in the control group and 5% in the intervention group, as shown in Table 1. Orthopedic and general surgical cases were highest with orthopedic cases at 25% for the control group and 15% for the intervention group and general surgery cases at 12.5% for the control group and 27.5% for the intervention group.

The following surgeries were included: cholecystectomy; hernia repair; open heart surgery; vascular surgery; thoracic surgery; gynecology surgery; orthopedic surgery; ears, nose, and throat surgery; plastic surgery; and general surgery. Endoscopies, bronchoscopies, and eye surgeries were excluded as well as radiology special procedures, thoracentesis, chest tube placements, and paracentesis as these were either done in the outpatient surgery room or they were less than a half hour in length.

Table 1: Demographics

Demographic	Overall		Control		Study	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Male	32	40%	16	40	16	40
Female	48	80%	24	60	24	60
Age						
1(18-25)	5	6.25%	3	7.5	2	5
2(26-36)	9	11.25%	8	20	1	2.5
3(37-47)	11	13.75%	5	12.5	6	15
4(48-57)	18	22.50%	11	27.5	7	17.5
5 (58-70)	18	22.50%	11	27.5	14	35
6(70>)	12	15.00%	2	5	10	25
Relationship						
1 Mother	8	10.00%	4	10	4	10
2 Father	1	1.25%	1	2.5	0	0
3 Sister	13	16.25%	6	15	7	17.5
4 Brother	2	2.50%	1	2.5	1	2.5
5 Daughter	8	10.00%	6	15	2	5
6 Son	4	5.00%	3	7.5	1	2.5
7 Spouse	44	55.00%	19	47.5	25	62.5
Ethnicity						
1 Caucasian	68	85.00%	30	75	38	95
2 African American	5	6.25%	4	10	1	2.5
3 Hispanic	6	7.50%	5	12.5	1	2.5
4 Asian	1	1.25%	1	2.5	0	0
Type of Surgery						
1 General	16	20.00%	5	12.5	11	27.5
2 GU	3	3.75%	2	5	1	2.5
3 Cosmetic/Superficial/Min	13	16.25%	8	20	5	12.5
4 GYN	9	11.25%	5	12.5	4	10
5 CV/Thoracic	1	1.25%	1	2.5	0	0
6 Ortho	17	21.25%	10	25	7	17.5
7 ENT	6	7.50%	0	0	6	15
8 Neuro	10	12.50%	6	15	4	10

The outpatient surgery area was a 25-bed unit located at the south end of the hospital and was a separate department within the main hospital. Patients could either begin their surgical experience in the outpatient area, have their procedure, and then be

discharged, or they could have their surgery and be admitted to the main hospital. Most of the patients lived in St. Augustine, Palm Coast, Palatka, Green Coves Springs, or Jacksonville, Florida. These cities were located within a 50-mile radius of St. Augustine.

Variables

The dependent variable in this study was the patient's family member's level of anxiety. The independent variable was use of the electronic patient tracking board. The control was the use of a volunteer in both groups to provide information.

Needs Assessment

A needs assessment helps to identify the target population, their health problems, a precipitating cause of the problem, and possible solutions. It was important to do a need assessment to plan and evaluate a program (Hodges & Videto, 2011). The identified population was the family members of surgical patients admitted through the same-day surgery department. According to Barrow (2010), understanding the health care needs of the population begins with identifying the demographics, health care needs, and predictive factors such as age and gender.

For this project, the needs assessment began with the identified problem of poor communication leading to the anxiety of surgical patients' family members. The problem was identified by an extensive literature search and validated by feedback from the surgical patient's family members. One solution was the addition of an electronic patient tracking board. The use of a demographics questionnaire in this study helped determine whether there were needs based on gender and age.

Data Collection

The study began with Institutional Review Board (IRB) approval 08-05-14-0372700 from Walden University and Flagler Hospital. All elective surgical patients' family members were eligible. Formal written consent was not necessary, as completion of the survey served as family member's consent. The eligible surgical patient's charts were assigned a randomized number (0 or 1) on the day of the procedure. The number determined which set of instructions the surgical patient's family members received. The control group received instructions in filling out the questionnaire when the surgical patient was ready to leave the recovery room. The intervention group received these instructions and a card (see Appendix C) along with an explanation of the use of the electronic patient tracking board. Upon arrival to the hospital, the surgical patient and family members were taken to a room in the outpatient surgery area. The outpatient surgery unit consists of 25 private rooms each containing a bathroom, television, recliner, and chair. The staff member explained the study verbally and gave the family a handout (see Appendix F). The patient selected the family member during the preoperative interview on the day of surgery after the study was explained. The family member was shown to the surgical waiting room when the patient was transferred to the holding area. The patient's family members in the intervention group had the unique patient identifier written on a card to track the patient on the electronic patient tracking board. The electronic board showed the three different areas the patient would be transferred to: holding, procedure, and recovery. When the patient was ready to be transferred to his or her room, the board indicated "Discharged To" along with the unit location. If the patient

was not being admitted to the hospital, the board indicated “Outpatient Discharge.”. When the volunteer in the surgical waiting room received notification that the patient was ready to be transferred from the postanesthesia care unit, he or she gave the patient’s family member a laptop computer to complete the questionnaire. The patient’s family member accessed the computer-based questionnaire through an icon located on the desktop. The icon was labeled Outpatient Surgery Study. Once the questionnaire was completed, the patient’s family member signed off and gave the laptop back to the volunteer. Family members in both groups filled out both portions of the State-Trait Anxiety Inventory for Adults (STAI) and the demographics section.

The control group was given information using the volunteer method. Volunteers or staff members notified the intervention group intermittently and through the use of the electronic patient tracking board . Once the family member clicked on the icon, he or she was brought to the demographics form and was prompted to complete the STAI Forms Y1 and Y2. The S-Anxiety scale was administered first, which was a series of 20 questions pertaining to how the participant felt at that time. The T-anxiety scale pertained to how the patient generally feels. The information sheet explained that all instructions must be read carefully and that there were two separate sets of instructions. It was recommended (Mind Garden, 2013),that the S-Anxiety scale be given first as it can be influenced by the anxiety created when filling out the T-test section. The intensity of the surgical patient’s family member anxiety was measured in the S-Anxiety score while the frequency of feelings was measured in the T-trait section of the questionnaire. The responses were checked electronically and were scored using a weighted rating. A rating

of 4 indicated a high level of anxiety for 10 S-Anxiety items and 9 T-anxiety items. Scores were calculated electronically. To obtain scores for each scale, I added the weighted scores for each of the 20 questions. I had purchased the Transform Online Survey and Scoring System option from Mind Garden. Mind Garden (2013) provided the data collection and scoring. The responses were scored on a Likert scale ranging from "Not At All" to "Very Much So" on the = Y-1 form and "Almost Never" to "Almost Always" on the Y-2 form. The responses were scored electronically by Mind Garden and the report identified scores ranging from 20 to 80, with 2 being equivalent to low anxiety and 80 equivalent to high anxiety. Once the questionnaire was completed, the information was stored by Mind Garden and was password protected.

The study took place over 2 months in the surgical waiting room outside of the outpatient surgery area. The waiting room had a volunteer sitting at a desk that was visible immediately when surgical patient family members entered. All family members were asked to register with the volunteer upon entering. The waiting room had a seating capacity to accommodate 50 people, a large flat-screen television on the far right wall, and a 60-inch flat-panel electronic patient tracking board located in the middle of the room facing the seating area. There were approximately 40 outpatient surgeries occurring daily with approximately 8 patients being admitted per day.

Two laptop computers were located in the outpatient surgery waiting room for completion of the survey. One computer was labeled "0" for the control group. The other computer was labeled "1" for the intervention group. The family member was identified on the daily schedule as control or intervention group. The laptops were locked in the

investigator's office at the end of the day. The computers were secure with access only to the link for the questionnaire. The questionnaire was administered through Mind Garden, which is a secure site providing permission to the rights to use The STAI . Mind Garden is an independent publisher offering high quality proven instruments for the research community Mind Garden staff assisted me in setting up a secure website for the project with a password to protect the data (Mind Garden, 2013). Scores for anxiety were calculated daily through Mind Garden and were posted on this secure website.

Human Subjects Protection

Human subjects protection is necessary for the self-respect, dignity, safety, and health of a participant. I had an ethical obligation to protect the rights, safety, and privacy of all participants in the study. The subjects had a right to (a) self-determination, (b) anonymity and confidentiality, (c) privacy, and (d) protection from discomfort and harm. There was not an increased risk for individual patients or family members as a result of this study.

Subjects chose to participate freely giving consent via assent. Because the patient's family member chose to complete the questionnaire, there was no need for written consent. Subjects could decline to participate at any time. The study participants were entered anonymously and the site was password protected. The information will be kept for 5 years in a password-protected file in Mind Garden, and I am the only person who has the password.

I analyzed data at the end of the study after a report from Mind Garden was generated. I compared the anxiety levels of the surgical patient's family members in the

control group with those in the intervention group. There were no links between the patient and the subject.

As the principal investigator, I was also the Director of Surgical Services who had interaction with staff in a supervisory but not clinical capacity. Twenty-one staff members and 10 volunteers volunteered to participate. All subjects were given a written explanation of the study (see Appendix D) and were given the opportunity to decline at any time (Burns & Grove, 2009).

Instrument

I used the STAI questionnaire (Appendix A) to collect data. The STAI Self-Evaluation Questionnaire has been reported to be reliable and valid and has been used repeatedly in research and clinical practice (Fountoulakis et al., 2006) Leske (1996) used the STAI questionnaire in a study to show the change in anxiety for the surgical patient's family members in conjunction with heart rate and blood pressure changes. Leske measured the surgical patient's family member's anxiety, but the findings did not pertain to the use of an electronic communication board. I used a separate demographic questionnaire (Appendix B), and variables included age, gender, type of surgery family member had, and family member's relationship to the patient.

The STAI is a self-evaluation, definitive instrument used for measuring anxiety by differentiating between temporary conditions or "state anxiety" and general long-term "trait" anxiety. There were two parts to the questionnaire with a total of 40 questions. The first 20 questions related to how the patient felt at the moment. The levels were rated on a scale of 1-4 with 1 meaning not at all and 4 being very much so. The second half of the

survey related to how the person generally felt. The self-evaluation questions were rated on a scale of 1-4 with 1 being not at all, 2 being somewhat, 3 being moderately so, and 4 being very much. In the Y-1 form the participant was asked to indicate how he or she felt at that moment. The self-evaluation questions for the Y-2 form asked the participant to circle the appropriate response to show how he or she generally felt. The questions were scored on a scale of 1-4 with 1 being almost never, 2 being sometimes, 3 being often, and 4 being almost always.

Trait anxiety measured the individual differences in reactions and perceptions. The answers are based on 1, almost never, 2 sometimes, 3 often, and 4 almost always. A score was given based on the answers from each section. The score was tallied electronically through Mind Garden (Mind Garden, 2013). The entire questionnaire took approximately 10 minutes. Possible scores ranged from a minimum of 20 to a maximum of 80.

Demographics

Demographics were at the beginning of the questionnaire pertaining to age, gender, ethnicity, and relationship to the patient, length of surgery, and type of surgery. The demographic section added value to the results of the survey by providing a picture of the dynamics of the data. The information gave clarity to phenomenon hidden in the data. Coding for the demographic data was according to each category included with the anxiety scores for each entry. The demographic scores provided comparability between the control and intervention groups.

A total of 32 relatives were male and 48 were female. Both demographics were equal as there were 16 male and 24 female relatives in the control group and 16 male and 24 female relatives in the intervention group (Table 1). Approximately 20% of the family members in the control group were greater than 55 years of age with 26% of the intervention group greater than 55 years of age. Relationship to the patient consisted of mother, father, sister, brother, daughter, son, or spouse in both groups. The greatest differences between relationships occurred for spouse in the control group at 47.5% and in the intervention group at 62.5% and daughter at 15% in the control group and 5% in the intervention group. (Table 1). Surgical volumes were highest for orthopedic and general surgeries with 25% for the control group and 15% for the intervention group in orthopedics and general surgery cases at12.5% for the control group and 27.5% for the intervention group (Table 1).

Statistical Data

The data analysis was completed comparing the effectiveness of the use of the electronic patient tracking board. A non-parametric analysis was conducted based solely on the order of which the observations from two samples fell. The data was based on ordinal data or the ranking of observations of the combined samples. The Wilcoxon Rank Sum test was used to test the hypothesis between the control and the intervention groups. The data was ranked from low anxiety to high anxiety for both groups (Western Kentucky University, n.d.). Demographics were summarized to assure accurate

comparability between the control and intervention groups. Statistical Package for the Social Sciences (SPSS21) was the statistical software used for calculations.

Project Evaluation Plan

A combination of formative and process evaluation was conducted after the project completion. The formative evaluation looked at any unanticipated problems that occurred during implementation and formulated strategies for solutions. The process evaluations analyzed the effectiveness of the program and determined if objectives were met. Process evaluation was used to explain the program's effectiveness.

The project evaluation plan consisted of engaging the stakeholders. The evaluation process included the involved staff. Feedback from stakeholders gave insight into the daily operations of the program and if they have any suggestions for improvement (Hodges & Videto, 2011). The next step in the evaluation was to clearly describe the program using a logic model (Appendix A). The Logic Model describes the activities of the project, relationships between activities, goals and objectives, and the theory used to guide the project. The Logic Model started with input and ended with the desired outcomes (Hodges & Videto, 2011).

Program evaluation analyzed the effectiveness of the program providing feedback, accomplishments, and impact (Kettner et al., 2013). The evaluation identified refinements and determined improvements (Kettner et al., 2013). Evaluation theories helped to guide the project and evaluation. General Systems Theory provided the framework for exploring the addition of the electronic patient tracking board to the surgical waiting room.

One of the guiding principles of the general systems theory is that change in one part of a system leads to change in the whole system and that communication and feedback mechanisms between system parts are essential for system function. Equilibrium can be equated to patient family member satisfaction. General Systems Theory looks at input which is the information received from the environment, throughput which is the intervention that has been modified, output which is the information collected as a result of the intervention, and feedback or the information received after the intervention has been sustained (McEwen & Willis, 2011). Relationships between what was tested are uncovered. The focus of this study was to investigate the effectiveness of an intervention used to decrease anxiety. The goal was to maintain equilibrium (Walonick, 1993).

According to Hodges & Videto, 2011, there are 4 types of evaluation; formative, process, impact, and outcome. In the formative evaluation, the appropriateness of the surveys were reviewed. The evaluation was of the written material as it applies to language and ability to read and understand. The process evaluation looked at the implementation and impact of short term goals and objectives. In this program, the impact would be if the environment in the surgical waiting room became stress and anxiety free. A decrease in stress and anxiety for family members using both the volunteer and the electronic patient tracking board is the expected outcome. The outcome evaluation looked at the overall improvement of surgical patients' family member's anxiety with the use of the electronic patient tracking board,.

Summary

Research suggests that the greatest universal need of families is timely communication regarding the patient's surgical progress (MacDonald, Latimer, & Drisdelle, 2006). Anxiety and stress are increased for the surgical patient's family members when communication is scarce (Campbell, 2012). The electronic board will provide the surgical patient's family members with up to date information, which may, therefore, decrease anxiety. (Surgical Information Systems, 2013). This study will add to the literature on improving surgical patient's family member's anxiety through timely and consistent communication using an electronic patient tracking board.

Section 4: Evaluation and Findings

Introduction

The purpose of this study was to determine whether the use of the electronic patient tracking board decreased the surgical patient's family member's anxiety. The surgical patient's family members face a time of uncertainty, worry, and anxiety during the surgical period. The use of the STAI questionnaire given post surgery indicated that the surgical patient's family member did not experience a change in his or her anxiety level as a result of the electronic patient tracking board. The control group had a volunteer who verbally gave information about the patient. The intervention group received information from the volunteer and the electronic patient tracking board. No differences between the control group and the intervention group were noted. A comparison of age, ethnicity, type of surgery, and family member relationship showed no noted differences.

Discussion

The STAI questionnaire was used post-surgery to monitor the surgical patient's family member's anxiety. Demographic documentation occurred simultaneously with the STAI questionnaire. Leske (1996) used the STAI portion of the state-anxiety scores and heart rates to compare anxiety levels of the patient's family member's anxiety when verbal information was given consistently. However, Leske's findings id not align with results from this study. Leske's results indicated a decrease in the surgical patient's family member's anxiety through consistent and accurate information provided by staff. In my study, I used the electronic patient tracking board to provide consistent and

accurate information in addition to verbal communication from a volunteer, but results did not show a decrease in the surgical patient's family member's anxiety.

The first objective of the study was to achieve the STAI questionnaire patient family anxiety score of less than or equal to 2 using the electronic patient tracking board. The expected outcome (use of the electronic patient tracking board would decrease the surgical patient's family member's anxiety) was not supported by the results of this study; therefore, the null hypothesis was retained. Armstrong and Ramirez (2006) noted that the electronic patient tracking board provides real-time data based on the location of the patient. The patient wears a tag that is powered by wireless Internet connection using positioning technology. The electronic patient tracking board has been used in both in the emergency room and the operating room to decrease confusion regarding the status of the patient, improve patient safety, increase efficiency, and improve communication.

The second objective of the study was to ensure seamless communication at regular intervals during the perioperative period. Seamless communication was accomplished for family members as there was a heightened awareness among staff members to ensure that information was given either by the volunteer or by both the volunteer and the electronic patient tracking board. Leske (1996) showed that consistent communication decreases the surgical patient's family member's anxiety.

The third objective of the study was to have staff members provide consistent information regarding the surgical patient to the family members. Heightened awareness of the importance of communication to family members was achieved, and was

consistent with empowerment of the staff to build stronger connections with family members as described in the literature (Compass$_s$ 2008).

Results

Family members of 400 surgical patients were given the opportunity to participate in this study. Family members were randomly assigned to either the control or study group. Due to study protocol violations, 320 participants were excluded from the study. Protocol errors consisted of volunteers giving the laptop to all participants instead of just to the intervention group and giving the access code for the electronic tracking board to both the control group and the intervention group instead of just to the intervention group. Therefore, a total of 80 family members were included in the analysis with 40 in the control group and 40 in the study group. Only one family member was asked to fill out the questionnaire for each patient.

The baseline demographic data were comparable. A total of 32 relatives were male and 48 were female. Both demographics were equal as there were 16 male and 24 female relatives in the control group and 16 male and 24 female relatives in the intervention group (see Table 1). Demographics of the groups consisted of gender, age, relationship to the patient, ethnicity, type of surgery, and length of the surgery. Approximately 20% of the family members in the control group were older than 55 years of age, and 26% of members in the intervention group were older than 55 years of age. Relationship to the patient consisted of mother, father, sister, brother, daughter, son, or spouse in both groups. The greatest differences between relationships occurred for spouse in the control group at 47.5% and in the intervention group at 62.5%, and daughter at

15% in the control group and 5% in the intervention group. The highest volume of surgical case were orthopedic surgeries with 25% for the control group and 15% for the intervention group, and general surgery cases with 12.5% for the control group and 27.5% for the intervention group. The length of the surgery and the age of the patient were not tracked.

There was no difference observed in scores from the State or Trait Questionnaire. The State portion of the pertained to how the family member felt at the time. The Trait portion of the questionnaire pertained to how the family member normally felt. There was no significant difference between the control group scores for the State Anxiety Questionnaire (M = -0.55, SD = 2.6) and the intervention group scores (M = -0.55, SD = 2.6), conditions t(78) =-.210, p=.83. Groups were not significantly different based on the Levene's test being greater than .05. Additionally, there was no significant difference in the Trait Anxiety scores (M = 3.0, SD = 2.0) in the control group compared with the intervention group (M = 3.0, SD = 2.0), conditions t(78) = 1.5, p=.14. In comparing the medians between groups, there was no significant difference observed. In the State Anxiety questionnaire the Sig value (2-tailed) was .834. This value was greater than p = 0.05, so the difference between the control and intervention groups was not statistically significant. In the Trait Anxiety questionnaire, the Sig value (2-tailed) was .144. This value was greater than 0.05, so the difference between the control group and the intervention group was not significant. I was unable to demonstrate that the addition of the electronic patient tracking board decreased anxiety in the surgical patient's family members. The null hypothesis was retained.

Table 2: Test Results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Up
State Anxiety	Equal variances assumed	0.403	0.527	-0.21	78	0.834	-0.55	2.622	-5.771	4.671
	Equal variances not assumed			-0.21	77.123	0.834	-0.55	2.622	-5.772	4.672
Trait Anxiety	Equal variances assumed	0.125	0.725	1.476	78	0.144	3	2.032	-1.045	7.045
	Equal variances not assumed			1.476	77.857	0.144	3	2.032	-1.046	7.046

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The medians of StateAnxiety are the same across categories of Group0control1study.	Independent-Samples Median Test	.823	Retain the null hypothesis.
2	The medians of TraitAnxiety are the same across categories of Group0control1study.	Independent-Samples Median Test	.118	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Discussion of Results

The results of this study did not support the hypothesis that the addition of the patient electronic tracking board would decrease family members' anxiety. The null hypothesis was that anxiety would not be decreased with the addition of the electronic

patient tracking board. The results indicate the null hypothesis should be retained. This was an underpowered study with differences that were smaller than anticipated. There are several possible reasons why there were no differences.

The use of just the State portion of the questionnaire was supported by the research project conducted by Leske (1996), who used both the State and Trait portions of the questionnaire. Using only the State portion of the questionnaire may be a better assessment method due to the length of time needed to take both questionnaires. The STAI has been one of the most widely used self-reported measures of anxiety since 1983 (Mind Garden, 2014).

The study protocol of randomly selecting the control and study participants was not followed for the first 320 participants. The laptops were labeled 0 for control and 1 for intervention. The laptops labeled 0 were assigned to the control group who were given only verbal information from the volunteer. The laptops labeled 1 were assigned to the intervention group who were given an access code for the electronic patient tracking board and were also given verbal information from the volunteer. In error, the volunteers gave laptops and codes for the electronic patient tracking board to participants regardless of which group they were assigned. After the break in protocol was discovered, the volunteers were re-trained and observed for compliance. There were 80 participants included in the study who followed the study protocol correctly. The sensitivity analysis was used to compared the last 80 participants with the previous 320, and no differences or trends were observed. Prior to the study, I determined that the study should include 400 participants even though the power analysis indicated that only 200 participants

would be necessary to detect a difference. Using only 80 participants for the study may have been insufficient. Therefore, the data collection process for the study was compromised.

The length of the surgical procedure can influence the degree of concern of the surgical patient's family members. The length of the procedure and the severity can provoke feelings of anxiety in the surgical patient's family member (Leske, 1996). Munday, Kynoch, and Hines, (2013) showed that there is an increase in fear and anxiety in the surgical patient's family members when waiting for a long period of time. The length of the surgery regardless of the type provoked feelings of anxiety. Limiting the length of surgery for the study may have been a better approach (Table 1).

Because the null hypothesis was retained, the information flow of the surgical patient's perioperative progress at present using personal communication may be adequate. The addition of the electronic patient tracking board to current clinical practice may not reduce anxiety. The results did not support the addition of the electronic patient tracking board to reduce family members' anxiety. The electronic patient tracking board may enhance the current practice through providing additional information to the surgical patient's family members through consistent communication (Leske, 1996). Leske (1996) showed that consistent communication with the surgical patient's family members decreased anxiety. Munday, et al. (2013) suggested that family members of patients undergoing any surgery face multiple stressors such as increased fear and anxiety while waiting for information. Munday, et al. argued that it was not the type of surgery but the lack of consistent communication that heightened anxiety. The electronic patient tracking

board may be a tool to decrease the surgical patient's family member's anxiety. However, I was unable to demonstrate this.

Summary

There is a gap of information measuring anxiety using electronic patient tracking boards. Although the results of this study did not provide support for decreasing The surgical patients' family member anxiety using the electronic patient tracking board, a study by Baker, et al. (2012), supports that communication that is understandable, complete, and consistent improves anxiety. The data from this study was unable to suggest that there is a difference with the addition of the electronic patient tracking board.

A different instrument to measure the surgical patient's family member's anxiety and a larger sample size should also be considered for future studies.A shorter questionnaire may keep the family member more engaged. Leske, (1996), only used one portion of the STAI keeping the participation in the study short. According to Cape (2010), data quality suffers as the interview lengthens.

Limiting the length of the surgery to include only the longer surgeries may be a consideration for future studies. The length of the procedure and the severity can provoke feelings of anxiety in the surgical patient's family member (Leske, 1996). Munday et al. (2013) showed that there is an increase in fear and anxiety in the surgical patient's family members when waiting for a long period of time. The length of the surgery regardless of the type provoked feelings of anxiety. This investigator used surgeries varying in length of time.

Implications

Impact on Practice

Family members have important needs to relieve anxiety during the surgical experience (Leske, 1996). Consistent communication is one way to meet those needs. Muldoon, et al., (2011), shows that a delay of information increases the patient's family member's anxiety. The use of the electronic tracking board, while the results did not show a difference, can only enhance the information that the family receives. The electronic patient information tracking board can integrate technology and add to the human factor of the volunteer giving information. The electronic tracking board can give the family member a sense of control while waiting for updates from the volunteer. Information needs to be communicated and provided for the surgical patient's family members to help them deal with stress, emotions, anxiety, and feelings of uncertainty (Lerman, et al., 2011). The use of the electronic tracking board may be useful to enhance the surgical patient's family member's experience and thus decrease family member anxiety and increase patient and family member satisfaction. This technology could also be used in each unit to supply consistent information not only for surgical patients but for alerting the patient and family members when they are due to go for tests or an estimate of discharge time.

Impact for Future Research

Future research is necessary to show the true impact of the use of the electronic patient tracking board. The structure of the study would be changed to require less time for the patient's family member to fill out the questionnaire. A qualitative approach may

be better to interview patients' family members and simply ask which method of communication helps to decrease anxiety. A qualitative interview may be viewed by the patient's family member as less threatening and even therapeutic (Burns & Grove, 2009).

Impact on Social Change

The impact the electronic patient tracking board will have on social change is that patient's family members can feel empowered to know where their family member is in the surgical process. The family feels in control of the situation, which keeps them consistently informed (Leske, 1996). A cultural change within the Surgical Services department is that communication to family members must be a high priority item, particularly after hours, during emergencies, and on weekends and holidays.

A process improvement project performed by the surgical services staff will be one way to find a solution to notifying family members after hours. A policy to address this is being created by staff. Discussions have included enhancements to the electronic patient tracking board. Some of the ideas are changing the unique identifying number to the first three initials of the last and first name and including an alert that the surgeon would like to meet with them.

The use of an electronic patient tracking board has many future possibilities to improve the patient and family member experience. A few of the future possibilities include the use of the electronic patient tracking board in different departments such as logistics, sterile processing, and admissions.

Projects Strengths and Limitations

Strengths

The project's strengths were the heightened awareness for consistent communication to the surgical patient's family members. Staff informed the patient and the family members about the communication process throughout the surgical experience. The staff realized that notifying the surgical patient's family member of the patient's progress was significant in reducing anxiety (Muldoon, et al., 2011). Consistent communication was provided either through the volunteer or the volunteer and the electronic patient tracking board.

Limitations

According to Hodges & Videto, 2011, there are four types of evaluation; formative, process, impact, and outcome. In the formative evaluation, the appropriateness of the surveys were reviewed. The evaluation was of the written material as it applies to language and ability to read and understand. In this study, two identical questionnaires were used for both the control and the study group consisting of 20 questions each. The volunteers reported to the researcher that the surgical patient's family members complained that the questionnaire asked repetitive questions that confused and frustrated the participants. There may have been a lack of understanding as to why there were two questionnaires. The length of the questionnaire may also have been a factor. The process evaluation looks at implementation the plan.

There was a deviation from the implementation plan for the first 320 participants. The volunteers gave everyone a card with the special identifier so that everyone had

access to the electronic patient tracking board. In this program, the impact was that the environment in the surgical waiting room remained stress and anxiety free. Stress and anxiety of family members for the families using both the volunteer and the electronic patient tracking board remained the same. The outcome showed that there was no significant difference in adding the electronic patient tracking board. However, this data was skewed during the sampling process.

Limitations also centered on the census in the Outpatient Surgery Department and the differences in the length of each surgical case. If there were a high census and staff was busy it was difficult to explain the study to the patient's family members. The study organizer was unable to finish the study and staff became indifferent to completing the study.

Recommendations for Remediation of Limitations

There are several suggestions for remediation of limitations. A backup staff member in case the study organizer is unavailable should be identified at the beginning of the study. Other suggestions would be the education of involved staff and a random check of study implementation and selecting one type of surgery so there is more consistency. Using a team approach to the study with clearly defined roles and staff engagement will improve the quality and success of the study. The team approach and staff involvement will promote ownership. Staff involvement will prevent foregoing the project on high census days (Kelly, 2012)

Limitations centered on the census in the Outpatient Surgery Department. If there were a high census and staff was busy it was difficult to have a staff member take the

time to explain the study to the patient's family members. During the study, the organizer changed employment and a replacement was not identified,

Analysis of Self

As a Scholar

The DNP project afforded the opportunity to work on a project that could improve the quality and satisfaction of patient care. Finding an area that needed awareness and improvement while involving staff proved to be rewarding. As a scholar, I have improved my skills in looking at a problem and searching the literature for evidence- based best practices. I have found that I can use evidence-based practice for all aspects of my profession. Nurses need to question their practice and look for alternatives to improve patient outcomes (White & Dudley-Brown, 2012).

As a Practitioner

As the Director of Surgical Services, I am faced with making changes for efficiency and finances as well. Proposals require evidence to support changes. I have also incorporated evidence-based practice into all implemented policies and procedures. The staff is encouraged to look at what is in the literature to support changes. I now look at processes, especially ones that have always been done one way, with an open mind. I also embrace change and respect flexibility. Being flexible allows us to find ways to adapt and improve our practice. As a practitioner I can facilitate the dissemination, integration, and evaluation of new knowledge while helping to empower other nurses to assess the need for change in practice (White & Dudley-Brown, 2012).

As a Project Developer

As a project developer, I now have the skills to bring forth new projects. I can look at a process, determine if a change needs to be made, review the literature, create excitement among staff for the change, and begin creating a plan. Creating excitement for making positive changes and developing a research project helps our unit to meet its goals, mission, and vision. We want to provide the best surgical care in Northeast Florida. To do this staff needs to be engaged and involved in creating a positive change. End users need to see the benefit of the intervention to put into practice (Titler, 2010). As a Doctor of Nursing Practice (DNP) and transformational leader I can facilitate the excitement, engagement of staff, encouragement of ideas, and dissemination of results to generate a positive impact on patient care.

Summary

Attending to the needs of the surgical patient's family members is an important aspect of the surgical experience. Family members experience anxiety and stress when waiting for information on the surgical patient's progress. The purpose of this project was to decrease the surgical patients' family member's anxiety by providing timely and consistent information. The hypothesis was that an electronic patient tracking board is providing additional information about the surgical process of a family member, in addition to personal interaction with a volunteer, can reduce family member's anxiety.

Results indicated that the addition of an electronic information display in addition to personal interaction with volunteers was unable to reduce STAI scores. One reason for the inability to detect a difference (reject the null hypothesis) may be the insufficient

number of enrolled subjects (underpowered). Another factor influencing the results is the multitude of different surgical procedures with different perioperative risks and durations. Another factor is the point of time the assessment is filled out. The family members were asked to fill out the form after the patient was ready to exit the recovery room. This time frame would be different depending on the procedure. Another influencing factor was that the study protocol was altered for the first 320 participants due to lack of understanding of the volunteers.

Even though the analysis of the data is unable to prove that providing additional information using an electronic tracking board reduces anxiety in surgical patients' family members, there is an opportunity to evaluate the potential benefits of the electronic tracking board. Another study is warranted.

Section 5: Scholarly Product

Executive Summary

Research suggests that the greatest universal need of families is timely communication regarding the patient's surgical progress (MacDonald, Latimer, & Drisdelle, 2006). Anxiety and stress are increased for the surgical patient's family members when communication is scarce (Campbell, 2012). The electronic patient tracking board could provide the surgical patient's family members with up to date information, which may, therefore, decrease anxiety. (Surgical Information Systems, 2013). It is the intent that this study will add to the literature on improving surgical patients' family member's anxiety through timely and consistent communication using an electronic patient tracking board. Attending to the needs of the surgical patient's family members is an important aspect of the surgical experience. Family members experience anxiety and stress when waiting to hear how a family member is progressing in surgery. The purpose of this project was to decrease the surgical patients' family member's anxiety by providing timely and consistent information. The hypothesis is that an electronic patient tracking board providing additional information about the surgical process of a family member, in addition to personal interaction with a volunteer, can reduce the surgical patients'family member's anxiety.

Family members have a need to relieve anxiety during the surgical experience (Leske, 1996). Consistent communication is one way to meet those needs. Muldoon, et al., (2011), shows that a delay of information increases the patient's family member's anxiety. The use of the electronic tracking board, while the results did not show a

difference, should enhance the information that the family receives. The electronic patient information tracking board integrates technology and adds to the human factor of the volunteer giving information. The electronic tracking board can give the family member a sense of control while waiting for updates from the volunteer. Information needs to be communicated and provided for the surgical patients'family members to help them deal with stress, emotions, anxiety, and feelings of uncertainty (Lerman, et al., 2011).

The State Trait Anxiety Inventory for Adults (STAI) questionnaire was used post-surgery to monitor the surgical patients' family member's anxiety. Comparisons included age, ethnicity, relationship, and type of surgery. Two studies by Leske, (1996), used the STAI portion of the scores and heart rates to compare anxiety levels of the patients' family member's anxiety when consistently receiving verbal information. Leske's studies, (1996), did not align with this study. Leske's results showed a decrease in the surgical patient's family member's anxiety through consistent and accurate information. This project used the electronic patient tracking board to provide consistent and accurate information in addition to verbal communication from a volunteer but did not show a decrease in the surgical patients' family member's anxiety.

The first objective of the study was to achieve the STAI questionnaire patient family anxiety at a score of less than or equal to 2 using the electronic patient tracking board. The results of this study did not support the expected outcome that the electronic patient tracking board would decrease the surgical patients' family member's anxiety. Literature specific to studies regarding the electronic patient tracking board was not

available. However, articles showing the successful use of the electronic patient tracking board were found. Armstrong & Ramirez (2006), announce an automatic tracking board that provides real- time data based on the location of the patient. The patient wears a tag that is powered by wireless Internet access using positioning technology. Many uses of the electronic patient tracking board have been identified both in the emergency room and the operating room to decrease confusion regarding the status of the patient, improve patient safety, increase efficiency, and improve communication. There were studies available related to the Electronic Medical Record (EMR) and alternative uses for data such as productivity.

The second objective of the study was to ensure seamless communication at regular intervals during the perioperative period. Seamless communication was accomplished for family members due to a heightened awareness among staff members to assure that information was given in a timely and consistent manner. Leske (1996) also shows that consistent communication decreases the surgical patient's family member's anxiety.

The third objective of the study was to have staff members engaged in providing consistent information regarding the surgical patient to the family members. Heightened awareness of the importance of communication to family members was achieved, and was consistent with empowerment of the staff to build stronger connections with family members as described in the literature (Compass et al., 2008).

Family members of 400 surgical patients were given the opportunity to participate in this study. Family members were randomly assigned to either the control or study

group. Due to study protocol violations 320 participants were excluded from the study. Protocol errors consisted of volunteers giving the laptop to all participants instead of just to the intervention group and giving the access code for the electronic tracking board to both the control group and the intervention group. Therefore, a total of 80 family members were included in the analysis with 40 in the control group and 40 in the study group. Only one family member was asked to fill out the questionnaire for each patient.

The baseline demographic data was comparable. A total of 32 relatives were male, and 48 were female. Demographics in both groups were equal as there were 16 male and 24 female relatives in the control group and 16 male and 24 female relatives in the intervention group (Table 1). Demographics of the groups consisted of gender, age, relationship to the patient, ethnicity, type of surgery, and length of the surgery. Approximately 20% of the family members in the control group were greater than 55 years of age with 26% of the intervention group older than 55 years of age. Relationship to the patient consisted of mother, father, sister, brother, daughter, son, or spouse in both groups. The greatest differences between relationships occurred for the spouse in the control group at 47.5% and in the intervention group at 62.5% and daughter at 15% in the control group and 5% in the intervention group. (Table 1). Surgical cases were highest in both groups for orthopedic surgeries with 25% for the control group and 15% for the intervention group followed by general surgery cases. At 12.5% for the control group and 27.5% for the intervention group (Table 1). The length of the surgery and the age of the patient were not tracked.

Table 1: Demographics

Demographic	Overall		Control		Study	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender						
Male	32	40%	16	40	16	40
Female	48	80%	24	60	24	60
Age						
1(18-25)	5	6.25%	3	7.5	2	5
2(26-36)	9	11.25%	8	20	1	2.5
3(37-47)	11	13.75%	5	12.5	6	15
4(48-57)	18	22.50%	11	27.5	7	17.5
5 (58-70)	18	22.50%	11	27.5	14	35
6(70>)	12	15.00%	2	5	10	25
Relationship						
1 Mother	8	10.00%	4	10	4	10
2 Father	1	1.25%	1	2.5	0	0
3 Sister	13	16.25%	6	15	7	17.5
4 Brother	2	2.50%	1	2.5	1	2.5
5 Daughter	8	10.00%	6	15	2	5
6 Son	4	5.00%	3	7.5	1	2.5
7 Spouse	44	55.00%	19	47.5	25	62.5
Ethnicity						
1 Caucasian	68	85.00%	30	75	38	95
2 African American	5	6.25%	4	10	1	2.5
3 Hispanic	6	7.50%	5	12.5	1	2.5
4 Asian	1	1.25%	1	2.5	0	0
Type of Surgery						
1 General	16	20.00%	5	12.5	11	27.5
2 GU	3	3.75%	2	5	1	2.5
3 Cosmetic/Superficial/Min	13	16.25%	8	20	5	12.5
4 GYN	9	11.25%	5	12.5	4	10
5 CV/Thoracic	1	1.25%	1	2.5	0	0
6 Ortho	17	21.25%	10	25	7	17.5
7 ENT	6	7.50%	0	0	6	15
8 Neuro	10	12.50%	6	15	4	10

There was no difference in the State or Trait questionnaire. The State portion of the questionnaire pertains to how the family member feels at the present time. The Trait portion of the test pertains to how the family member normally feels. There was not a

significant difference in the control group scores for the State Anxiety questionnaire *(M=-0.55, SD=2.6)* and the intervention group scores (M=-0.55, SD =2.6), conditions t*(78) =-.210, p=.83.* Groups were not significantly different based on the Levene's test being greater than .05. Additionally, there was not a significant difference in the Trait Anxiety scores (*M=3.0, SD=2.0)* in the control group and (*M=3.0, SD=2.0)* nor in the intervention group, conditions *t(78) = 1.5, p=.14.* In comparing the medians between groups of the State and Trait questionnaires there was no significant difference. In the State Anxiety questionnaire the Sig value (2-tailed) is *.834*. This value is greater than *p=0.05* so the difference between the control and intervention groups is not statistically significant. In the Trait Anxiety questionnaire the Sig value (2-tailed) is *p=.144.* This value is greater than *0.05* so the difference between the control group and the intervention groups is not statistically significant. The researcher was unable to prove that the addition of the electronic patient tracking board decreased anxiety in the surgical patient's family members. The null hypothesis was retained.

Table 2: Test Results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Up
State Anxiety	Equal variances assumed	0.403	0.527	-0.21	78	0.834	-0.55	2.622	-5.771	4.671
	Equal variances not assumed			-0.21	77.123	0.834	-0.55	2.622	-5.772	4.672
Trait Anxiety	Equal variances assumed	0.125	0.725	1.476	78	0.144	3	2.032	-1.045	7.045
	Equal variances not assumed			1.476	77.857	0.144	3	2.032	-1.046	7.046

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The medians of StateAnxiety are the same across categories of Group0control1study.	Independent-Samples Median Test	.823	Retain the null hypothesis.
2	The medians of TraitAnxiety are the same across categories of Group0control1study.	Independent-Samples Median Test	.118	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

The results of this study did not support that the addition of the patient electronic tracking board decreased the family member's anxiety. This was an underpowered study with differences that were smaller than anticipated. There are several reasons offered why there were no differences:

The use of just the State portion of the questionnaire was supported by the research project conducted by Leske (1996). This investigator used both the State and Trait portions of the questionnaire. Using just the State portion of the questionnaire may

be a better assessment tool due to the length of taking both questionnaires at the same time.

The study protocol of randomly selecting the control and study participants was not followed for the first 320 participants. The laptops were labeled 0 for control and 1 for intervention. Laptops and codes for the electronic tracking board were given to participants regardless of which group they were assigned. After the break in protocol was discovered the volunteers were re-educated and observed for compliance. There were 80 participants included in the study that followed the study protocol correctly. The sensitivity analysis compared the last 80 participants to the previous 320 and did not show any difference or trend. Prior to starting the study it was determined that the study would include 400 participants, though the power analysis indicated that only 200 participants were necessary to detect a difference. Using only 80 participants for the study may have been insufficient.

The length of the surgical procedure can influence the degree of concern of the surgical patient's family members. The length of the procedure and the severity can provoke feelings of anxiety in the surgical patient's family member (Leske, 1996). Munday, Kynoch, & Hines, (2013), show that there is an increase in fear and anxiety in the surgical patient's family members when waiting for long period of time. The length of the surgery regardless of the type provoked feelings of anxiety. Limiting length of surgery for the study may be a better approach and comparison for the study (Table 1).

Since the null hypothesis was retained, the information flow of the surgical patient's perioperative progress at present using personal communication may be

adequate. Therefore, the addition of the electronic patient tracking board to our current clinical practice did not reduce anxiety. The evidence did not support that the addition of the electronic patient tracking board decreased family member anxiety (Table 2). The electronic patient tracking board may enhance the current practice through providing additional information to the surgical patient's family members through consistent communication (Leske, 1996). Leske, (1996) showed that consistent communication with the surgical patient's family members decreased anxiety. Munday, et al., (2013), suggests that family members of patients undergoing any surgery face multiple stressors such as increased fear and anxiety while waiting for family members. Their study showed that it was not the type of surgery but the lack of consistent communication that heightened anxiety. The electronic patient tracking board may be a tool to decrease the surgical patient's family member's anxiety, however, this investigator was unable to demonstrate this.

There is a gap of information measuring anxiety using electronic patient tracking boards. Although the results of this study did not provide support for decreasing patient family member anxiety using the tracking board. a study by Baker, et al. (2012), supports that communication that is understandable, complete, and consistent improves patient satisfaction. The data from this study suggests that there is no difference with the addition of the electronic tracking board.

A different instrument to measure the surgical patient's family member's anxiety and a larger sample size should also be considered for future studies. A shorter questionnaire may have kept the family member engaged. Leske, (1996), only used one

portion of the STAI keeping the participation in the study short. According to Cape (2010), data quality suffers as the interview lengthens.

Limiting the length of the surgery to include only the longer surgeries may be a consideration for future studies. The length of the procedure and the severity can provoke feelings of anxiety in the surgical patient's family member (Leske, 1996). Munday, Kynoch, & Hines, (2013), show that there is an increase in fear and anxiety in the surgical patient's family members when waiting for long period of time. The length of the surgery regardless of the type provoked feelings of anxiety. This investigator used surgeries varying in length of time.

The analysis of the data is unable to prove that providing additional information using an electronic tracking board reduces anxiety in surgical patients' family members. However, by addressing the abovementioned faults of the study, additional studies should be performed to show the effects of adding an electronic patient tracking board into the surgical waiting room. Additional information for the surgical patient's family member can only enhance the experience (Munday et al., 2013). The electronic patient tracking board can provide up to date information while giving the family member a sense of control.

Future research is necessary to show the true impact of the use of the electronic patient tracking board. The structure of the study would be changed to require less time of the patient's family member to fill out the questionnaire. A qualitative approach may be better to personally interview patient's family members and simply ask which method of communication helps to decrease anxiety. A qualitative interview may be viewed by

the patient's family member as less threatening and even therapeutic (Burns & Grove, 2009).

Even though the analysis of the data is unable to prove that providing additional information using an electronic tracking board reduces anxiety in surgical patients family members, data should still be collected to determine if the use of an electronic patient tracking board statistically decreases the anxiety level in surgical patient's families.

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Appendix A: State –Trait Anxiety Inventory for Adults

State-Trait Anxiety Inventory for Adults Scoring Key (Form Y-1, Y-2)

Developed by Charles D. Spielberger in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, fold this sheet in half and line up with the appropriate test side, either Form Y-1 or Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question # 1, if the respondent marked 3, then the **weight** would be **2**. Refer to the manual for appropriate normative data.

Form Y-1	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	4	3	2	1
2.	4	3	2	1
3.	1	2	3	4
4.	1	2	3	4
5.	4	3	2	1
6.	1	2	3	4
7.	1	2	3	4
8.	4	3	2	1
9.	1	2	3	4
10.	4	3	2	1
11.	4	3	2	1
12.	1	2	3	4
13.	1	2	3	4
14.	1	2	3	4
15.	4	3	2	1
16.	4	3	2	1
17.	1	2	3	4
18.	1	2	3	4
19.	4	3	2	1
20.	4	3	2	1

Form Y-2	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21.	4	3	2	1
22.	1	2	3	4
23.	4	3	2	1
24.	1	2	3	4
25.	1	2	3	4
26.	4	3	2	1
27.	4	3	2	1
28.	1	2	3	4
29.	1	2	3	4
30.	4	3	2	1
31.	1	2	3	4
32.	1	2	3	4
33.	4	3	2	1
34.	4	3	2	1
35.	1	2	3	4
36.	4	3	2	1
37.	1	2	3	4
38.	1	2	3	4
39.	4	3	2	1
40.	1	2	3	4

Appendix B: Demographics

Gender: 1= male 2= female

Age: 1= 18-25 2= 26-36 3= 37-47 4= 47-57 5= 58-70 6= 71 and above

Relationship to patient: 1= Mother 2= Father 3= Sister 4= Brother 5= Daughter 6= Son 7= Husband 8= Wife

Ethnicity: 1= Caucasian 2= African American 3= Hispanic 4= Asian 5 = Indian

Type of patient surgery:

Length of patient surgery:

Appendix C: Patient Identifier Card

ELECTRONIC SURGICAL PATIENT TRACKING BOARD

PATIENT IDENTIFIER: _____

Instructions:

After the patient is taken to the holding area to be prepared for surgery, you will be directed to the surgical waiting room. Please check in with the volunteer. You will notice a large TV screen on the wall opposite the volunteer's desk. This is the Electronic Patient Tracking Board. Here information will be displayed regarding patients. You can identify your family member by the unique patient identifier at the top of this card. The board will show the location the patient is in currently. Every time the patient moves to a new phase of care the board is updated immediately. Once the patient is ready to move from the post anesthesia care unit an icon of a person carrying flowers will run across the screen. If you have any questions the volunteer will be happy to assist you. Please let the volunteer know if you leave the area.

Thank you

Pam Barberi RN, MSN, CNOR

Director of Surgical Services and Magnet Program Director

Appendix D: Surgical Patient's Family Member Anxiety Study In-Service for Staff and Volunteers

Education In-Service for Study

In-service is for staff that has volunteered for the study.

Goals & Objectives

Leske, 1996, suggests that the waiting period during surgery is the time when anxiety is the highest for family members. She found that family members that received intraoperative reports were less anxious than those family members that did not receive any reports.

The primary goal is to decrease surgical patient's family member anxiety while waiting for surgery. This can be accomplished by providing consistent and current information. The electronic patient tracking board is one way to accomplish this.

Instructions:

The family members of patients undergoing elective surgery will receive an information sheet asking them to participate in a study to help to decrease surgical patient family member anxiety.

The intervention group will receive a patient identifier on a 3x5 card. The card will also explain the electronic patient tracking board and how to use it. The charge nurse will give the family member this card at the time of arrival. Family members will then be taken to the waiting room and asked to check in with the volunteer. The volunteer will be given a list of those patients who will have a family member that will be filling out a computer questionnaire. The electronic patient tracking board is mounted on the wall opposite the

volunteer's desk and centrally located so that family members can easily see it. Locate your special patient identification number on the board. As the patient moves from one area to another the location on the board will change. When the patient is moved to the post anesthesia care unit the surgeon will visit the family member. When the patient is ready to leave the post anesthesia care unit a small person carrying flowers will run across the screen. The floor number will also be displayed. The volunteer will give the family member the room number and at the same time bring the computer to the patient to fill out the questionnaire.

Staff in all areas of Surgical Services will be reminded of the importance of documenting the time at the arrival of each area. If the arrival times are not charted immediately then the family members are not receiving accurate information.

Through a randomization process some family members will receive a unique patient identifier (the intervention group) and will be brought a computer by the volunteer in the waiting room and shown how to click on the icon and fill out the questionnaire. The volunteer will bring the family member the computer once they are given a room number for the patient. The control group will only be given information from the volunteer.

All family members have the right to refuse to complete the study.

Please contact either the charge nurse ext. 4065 or Pam Barberi ext. 4064 with any problems or questions.

Reference

Leske., J.S. (1996). Intraoperative progress reports decrease family member's anxiety. *AORN Journal 64(3)*Retrieved from http://www.elsevier.com

Appendix E: Rights to State-Trait Anxiety Inventory for Adults

Rights to use the State-Trait Anxiety Inventory for Adults were granted by Mind Garden. The researcher purchased the right to use 400 of the questionnaires.

Appendix F: Patient and Family Member Information Sheet

Project: Increased Communication Through the Use of the Electronic Patient Tracking Board

Researcher: Pam Barberi, MSN, RN, CNOR

Director of Surgical Services

This study is conducted on a volunteer basis. We will ask you to identify a family member who would be willing to fill out a 40 question questionnaire to help determine if the addition of an electronic patient tracking board is beneficial to the surgical patient's family members while waiting for the patient to finish surgery.

The study has two groups: The control group that is the current practice. Here the volunteer offers information when requested concerning the patient's surgical progress.

The second group is the intervention group. This group will have access to the electronic patient tracking board as well as receiving updates from the volunteer.

This is a randomized study meaning that the groups are selected randomly.

This study is on a volunteer basis and can be terminated at any time.

This study is confidential and the participants are anonymous. The data is kept on line and is protected by a password that only the researcher has access to.

The survey is accessed through an icon on the desktop of a specified laptop computer. When the patient is getting ready to leave the recovery area you will be asked

to fill out the questionnaire. There are 40 questions. The questionnaire should take no longer than 10 minutes.

Thank you for helping us to improve your surgical experience.

Pam

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