A DNP PROJECT

Decreasing Pre-procedure Anxiety in School-aged Patients in an Outpatient Surgery Setting Using a Video Prior to Anesthesia Induction

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by

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Abstract

Introduction: Anxiety occurs when a human feels a threat in response to a situation. Having surgery can heighten this psychological reaction, especially in pediatric patients undergoing anesthesia. Many children fear anesthesia for they do not understand what is expected of them nor what to expect when entering an operating room. When anxiety and fear are elevated, it can lead to behavioral changes, increases in postoperative pain, delays in wound healing, and postponement of discharge. Eliminating or reducing anxiety can result in positive outcomes for patients with pain, healing, and discharge. Literature supports the use of an educational video to aid in reducing these fears, which was the aim of this quality improvement project.

Methods: In an outpatient surgery setting, each patient was assessed with a visual analog scale to determine initial anxiety levels. Then an educational video was presented to the pediatric population with the proper education of what to expect at their time in the hospital as well as introduce the various professionals they will be interacting with during their stay. A follow up visual analog scale score was determined immediately after the educational video.

Results: A total of 100 patients took part in this quality improvement project, aged six to 10. Data revealed a 63% improvement in anxiety levels after watching the educational video.

Conclusion: It was shown that this age-appropriate educational video and preparation can aid in facilitating a positive surgical experience that can reduce anxiety and also impact the child's future views of medical encounters.

Keywords: education, preoperative anxiety, peer model video, video, visual analog scale, pediatrics, anesthesia induction, ambulatory, outpatient, school-aged children

Decreasing Pre-procedure Anxiety in School-aged Patients in an Outpatient Surgery Setting Using a Video Prior to Anesthesia Induction

Background and Significance

Nearly five million children undergo surgery every year in North America, and up to 75% of them experience some sort of preoperative anxiety (Perry et al., 2012). Surgery can be a traumatic experience for patients undergoing any type of procedure, especially the school-aged population. According to Landier et. al (2018), the fear of anesthesia is the most common worry for parents whose children are having surgery. It has also been revealed that parental anxiety is correlated to their child's anxiety preoperatively (Matthyssens et al., 2020).

School-aged children in general have many reactions to medical experiences such as fear of pain or injury, fear of loss of control, or of the unknown (Panella, 2016). Knowing that surgery is going to occur has the potential to create an uncomfortable, challenging, and exhausting mindset for patients. These all can lead to negative behavioral changes, postoperative pain, sleep disturbances, and even delays in wound healing. The unfamiliarity of anesthesia and surgery can be extremely stressful for patients and their family members. The fear of not waking up from anesthesia or awakening during surgery causes undue levels of anxiety to school-aged children. Other sources of anxiety come from possible complications after surgery including paralysis, disability, and wound pain after surgery (Lee et al., 2018).

One pediatric outpatient surgical setting recently observed a need to manage anxiety among its patients by modifying its procedures. Currently, when pediatric patients check into the hospital by their parents/caregivers/guardians for outpatient surgery their process begins at the front entrance where insurance information is collected and patients are presented with their armbands; this typically occurs two hours before surgery. From there, the patient is sent upstairs

to the outpatient surgery waiting room. Parents/caregivers/guardians check in again at the reception desk and wait in the waiting area until called back to the preoperative area. Once called back, the patient changes into a gown and the preoperative nurse will take the time to record the patient's vital signs, review the patient's history with the parents/caregivers/guardians, and determine if surgical consents have been completed. About five minutes before surgery start time, the attending surgeon will discuss any last-minute concerns with the patient and parents/caregivers/guardians, as the majority of surgery discussion has already taken place in the office before surgery. At the same time, the anesthesia provider will also come and discuss the process of how anesthesia occurs, review medical history and last meal intake, and address any further concerns with the patients and parents/caregivers/guardians. Standard verbal education is presented to all patients and families about what is going to occur during their stay. Once this is complete, the operating room (OR) nurse will come and review that the consents are complete, ensure there are no further questions or concerns, then bring the patient back to the operating room.

After arrival in the operating room, the appropriate tools/sensors are attached to the patient to monitor vital signs. Then an oxygen mask is placed on the patient to assist with putting the patient to sleep. After this has been achieved, an intravenous (IV) line is placed for venous access to safely give medications and fluid replacement. The child then has the appropriate airway placed for safe anesthesia throughout the surgery. It is after this that the surgeon can then take over and perform the appropriate surgery on the patient. Once surgery has finished, the patient is transported from the OR to the post anesthesia recovery unit (PACU). In PACU, the patient will start to wake up from their anesthesia and will possibly be experiencing some pain and confusion. Here the PACU nurses will aid the patient in recovery by providing pain

medications if needed, reorienting them to what just occurred, encourage oral fluid intake, and reuniting them with parents/caregivers/guardians. Once the patient has been deemed appropriate for discharge by the anesthesia provider, the PACU nurse will remove the IV-line, present follow-up paperwork to the parents/caregivers/guardians and assist with any needs with transport to the vehicle.

Child life specialists are often available throughout a child's hospital stay to aid patients and families through the process of illness or hospitalization. These professionals help to explain medical jargon to patients and even explain different procedures in detail. Ideally, they would be available for patients before surgery to aid in relieving fears or offer additional comfort or education. They are typically present in most surgery departments at children's hospitals throughout the United States. Currently, at the outpatient surgery center for pediatrics, there are no child life specialists available to offer any services to patients. These specialists are often too consumed with pediatric patients in the main OR that there is no time to allocate to the outpatient surgery area. This deficit in available professionals leaves a gap for these specific children that have procedures within this department. This leaves a very clear problem for patients in the outpatient surgery center. These children within this department are often consumed with fear and anxiety as they do not get the proper education preoperatively from the child life specialists that they deserve. This increased anxiety also leads to patients having to take a medication in the preoperative area to help decrease their nervousness. Providing specific education tailored to these patients is absolutely vital and needed to reduce unnecessary fears and decrease the need for further staff.

The objective of this quality improvement (QI) project was to reduce preoperative anxiety in school-aged children about to experience anesthesia induction in an outpatient surgery

setting with the use of an educational video. This video was targeted at school-aged children and showed them the different areas of the hospital the patient encountered including the people on multidisciplinary teams. It described who the team members are and their role in the patient care. It also showed the different places the patient encountered in their patient experience starting in the preoperative area, to the OR, then finally to the PACU, and discharge. The various tools and materials that are used on the patient were showed and explained. They then had the opportunity to ask any questions to address any further concerns. The impact of this educational video was evaluated on each patient's perception of anxiety and preparedness for anesthesia using a visual analog scale (VAS) that was easily identifiable for a pediatric patient. Due to there being no child life specialists available at this particular unit, the purpose of this video aided each patient in feeling more prepared and less anxious for surgery resulting in an overall better outcome for the patient. The project site strives to provide the best care for its pediatric patients and wants them to feel completely comfortable during their stay. Incorporating a useful and impactful educational video aligned with their strategic priorities of putting the patient first and addressing their concerns of fear and anxiety. The site had already been made aware of this deficit in child life specialists and education.

Preoperative educational interventions have been shown to reduce anxiety, decrease pain, and improve patient's psychological well-being, as well as improving patient satisfaction scores (Lee et al., 2018). By providing patients with health-related information, teaching them techniques to aid in reducing discomfort, and providing psychological support before surgery it may help in attenuating anxiety and stimulating feelings of control (Burgess et al., 2019). By implementing education preoperatively, patients may also feel confident in their adaptive coping strategies. An increase in patient preparedness paired with reduced anxiety has been linked with

increased quality of life as well as health management (Koekenbier et al., 2016). It is absolutely vital that healthcare professionals play an active role in patient education, as well as encouraging patients to be active participants.

It has been determined that the school-aged patients between the ages of six to 10 have increased exposure to the use of media (Panella, 2016). They value their peers and are strongly influenced by them during these years. These individuals also find visual aids as being an exceptional way to understand the concepts of surgery and anesthesia. This vital information aided in helping to determine that the use of a video is an appropriate tool to educate patients in this age range.

Search Process

The searchable question aimed to address if the implementation of a preoperative educational video designed at school-aged patients prior to anesthesia induction in an outpatient surgery center can aid in decreasing anxiety. A systematic search was conducted through numerous electronic databases such as CINAHL, EBSCO, and ProQuest, using the Jacksonville University (JU) Library. A variety of combinations of the keywords searched included: *school-aged, outpatient surgery center, anxiety, preoperative education, surgery, pediatric patients, preparation for surgery, preoperative anxiety, preparedness, visual analog scale, anesthesia.* The delimiters in the search were full text, peer-reviewed, and last five years.

The literature review aimed to discover various published information that was related to (a) school-aged patients undergoing anesthesia, (b) preoperative anxiety, (c) different ways to manage anxiety in the school-aged population, and (d) various preoperative teaching interventions or programs for pediatric patients. The inclusion criteria were medical or nursing journals that were peer-reviewed, full text, and published after the year 2015. The exclusion

criteria were articles not written in the English language. The types of studies that were selected from the seventy-five articles that were reviewed included systematic reviews, randomized controlled trials (RCT), double-blind interventional studies, mixed-methods systematic reviews, as well as pilot studies. The twenty articles that were chosen focused on preoperative anxiety in patients undergoing anesthesia and the methods to eliminate it before anesthesia induction.

Literature Review

Preoperative Education with Videos

At a tertiary hospital in India, a double-blind interventional study was complete to discover if the use of an informative video about the anesthesia techniques could lower anxiety levels in children having surgery (Baghele et al., 2019). A total of 94 children aged seven to 12 participated, half were in the control group while the other half were in the intervention group. A VAS for anxiety was complete on all patients as well as assessing hemodynamic parameters such as heart rate and blood pressure one hour before surgery. The video that was shown to the control group was a five-minute peer video that included three clippings. The first clipping depicted a child in the preoperative holding area and then getting escorted to the OR. The second clip showed monitors being attached to the patient, their intravenous (IV) line secured, mask and inhalation induction, and falling asleep. The third clip showed a patient sleeping comfortably in the postoperative anesthesia recovering unit with oxygen. After the video, parents and patients were able to ask any questions. Results revealed the preoperative VAS score was significantly lower in the intervention group compared to the control group, the hemodynamic parameters also were significantly lower in the study group compared to the control.

A systematic review was conducted to address the stress and anxiety that is experienced amongst pediatric patients and families before surgery (Yahya AL-Sagarat et al., 2017). The

different studies were reviewed. One study was composed of 162 patients, the second study was 111 patients, and the third was 161 patients that all received an educational video before surgery. Overall, between the three studies it was revealed that the education video showed great satisfaction amongst patients, improved attitude and behavior postoperatively, and lowered anxiety levels amongst patients and parents.

A systematic review was performed addressing the anxiety and stress that is experienced by children undergoing surgery and what interventions can aid in decreasing these emotions (Aranha et al., 2017). Much analysis was complete verifying the use of sedative medications preoperatively, the use of parental presence during anesthesia induction, and numerous techniques to help with various behavior preparation. Preoperative psychological preparation is vital in reducing anxiety in children undergoing anesthesia. Evidence showed that videos, interactive games, and multifaced programs appear to be most effective as opposed to music therapy and internet programs which were found to be less effective. Virtual tours were also found to be an effective tool to aid in reducing preoperative anxiety in children.

Multimedia Application

An additional study was a RCT evaluating the use of a multimedia application to prepare pediatric patients for outpatient surgeries (Fernandes et al., 2014). The study was composed of 90 pediatric patients aged eight to 12. The intervention group received an educational multimedia interactive tool viewed on a tablet called “an adventure at the hospital” the day of surgery. The comparison group played video games such as Mario Brothers while the control group received the standard education from preoperative staff. The participants were first assessed with a children’s self-assessment manikin (SAM), which is similar to a visual analog scale to self-assess anxiety with a picture of how they feel, along with assessing physiological responses (blood

pressure and heart rate). Parents were also assessed with the State-Trait Anxiety Inventory (STAI), which is an anxiety scoring questionnaire. The patients from the educational group reported a considerably lower anxiety score compared to those in the comparison and control group. The parents in the intervention group also reported lower STAI scores which may have been related to seeing their children distracted and anxiety relieved. No changes were noted in the physiological responses.

Various Types of Educational Material

A RCT was conducted to test different types of educational material to reduce preoperative worries in pediatric patients (Fernandes et al., 2014). Three hospitals participated in the study in a specific metropolitan area of Portugal. The sample size was composed of 125 patients aged eight to 12 years old. Children were randomly assigned to one of three groups which consisted of the experimental group, the compare group, and the control group. The patients in the experimental group were given educational information regarding surgery and hospitalization in the form of a booklet, videos, or board games. The comparison group used the same type of material except it did not contain any information about hospitalization or surgery. The control group did not receive any type of material. Preoperative worries were assessed pre-intervention and post-intervention with a Child Surgery Worries Questionnaire as well as a Wong-Baker Faces Scale (similar to a VAS scale). Parental anxiety was also assessed with a State-Trait Anxiety Inventory Form again both pre-intervention and post-intervention. Results revealed that patients in the experimental group reported statistically significant lower worries preoperatively than the comparison and control groups. However, there was no statistical significance between the comparison and the control group. These results indicate the experimental group was the most significant in decreasing worries. The comparisons between the

different types of educational materials (video, board game, and booklet) revealed no statistical significance, as they all equally aided in a reduction of anxiety. This study continued to shed light on the importance and need for preoperative education in aiding in reducing pediatrics worries, increasing knowledge, and reducing parental anxiety.

A RCT was guided by Landier et. al. (2018) where a written document was created with preoperative information for pediatric surgery. This document was provided to parents in the hope to reduce their anxiety and increase their knowledge and satisfaction. One hundred seventy-eight patients were randomly put into two groups. Immediately before the intervention, both groups were assessed for anxiety using the VAS and the Amsterdam Preoperative Anxiety and Information Scale (APAIS). The intervention group received the education via a leaflet. Immediately after education was given anxiety was assessed and was determined that the control group had a significant increase in anxiety on the day of surgery compared to the intervention group.

Preoperative Game

A pilot study was tested to determine if the use of a serious game titled CliniPup helped reduce preoperative anxiety in pediatric patients (Matthyssens et al., 2020). Clinipup uses a playful character to guide patients on a typical day in surgery and allows individuals to anticipate what will occur at the hospital. At a university hospital in Ghent, Belgium a total of 72 children aged five to 11 were randomized to either play an “empty game” as a control group or play CliniPup before surgery. A VAS was assessed on all patients at six different times in the study, including one week before surgery and intervention, one week before surgery after the intervention, the morning of surgery, immediately postoperatively, one week postoperatively, and one month postoperatively. After playing the games, the patients in the intervention group

were found to have a statistically significant reduction in anxiety in comparison to their own baseline VAS score. They also had a statistically significant lowered anxiety score compared to the control group.

Multiple Audiovisual Interventions

Chow et. al. (2018) conducted a systematic review of 18 randomized controlled trials to determine if the use of audiovisual interventions helped reduce anxiety in children that were undergoing surgery. There were 1,897 children studied from ages one to 16. The primary outcomes of these studies were to determine if anxiety was reduced while secondary outcomes focused on postoperative pain, patient satisfaction, behavioral changes, anesthesia induction compliance, recovery, and cost-effectiveness. The interventions used included audiovisual videos anywhere from five to 22 minutes long and viewed five to 22 days before surgery. Other studies used preparation programs that included videos, pamphlets, and audiotapes. Another vital tool was the use of child life specialists. Various measuring instruments were used in assessing anxiety including the Yale Preoperative Anxiety Scale (YPAS) that was utilized in nine studies, as well as the State-Trait Anxiety Inventory – Children (STAI-C), Wong-Baler FACES, and the observer rating scale. Of the 18 studies, 14 showed positive effects on reducing children's preoperative anxiety. Nine of the 18, used some form of video intervention, and seven of these nine reported positive effects of reducing anxiety.

A mixed-method systematic review was completed to determine the effectiveness of a preoperative psychological preparation program preoperatively to reduce anxiety in pediatric patients (Dai & Livesley, 2018). Nineteen controlled trials were completed studying 2,111 children aged two to 14. Of the 19, two were qualitative studies that used a grounded theory and phenomenological approach to share experiences of what surgery was like and what it meant to

them. The other trials were controlled and used books/booklets, videos, web programs, and therapeutic play. Results of these studies indicated the use of surgery-related booklets was proven beneficial to children as opposed to those who did not read the booklet in reducing anxiety levels. Other studies showed that the experimental group had a statistically significant lower anxiety level after a surgery-related video and booklet was viewed, as well as a reduction in their parent's anxiety levels. This review also concluded that the effectiveness of therapeutic play was inconclusive.

A review of the use of preoperative preparation programs (PPP) that contain verbal, written, and multimedia information about a procedure and what to expect have also been analyzed for best practice (Capurso & Ragni, 2016). Various sample sizes of pediatric patients and families from a total of 21 studies were reviewed and evaluated. Along with the use of the PPP, distractive techniques such as video games, toys, cartoons, clowns, and music were used, as well as the use of parental presence during anesthesia induction. Each intervention was shown to have its own benefits and limitations. With the use of the PPP, parents felt very informed and involved with their child's care. Many of the distractive techniques were found to be effective in patients compared to the control group. Mixed reviews were presented on the use of parental presence during induction. It really depended on the parent and their calmness in the matter.

Interviewing Anesthesia Providers

A qualitative, descriptive approach was completed interviewing anesthesia providers to elicit information to determine what were the best ways to approach patients in reducing or eliminating anxiety or fears in children prior to anesthesia induction (Bizzio et al., 2020). The purpose of the study was to explore non-pharmacological interventions to aid in reducing anxiety in pediatric patients before anesthesia induction. It was described how pharmacological

interventions, such as the use of Versed, an anxiolytic, are associated with an increase in cost to the hospital relating to surgical delays while waiting for the medication to become effective and delayed discharge from PACU. It was also revealed that preoperative distress can lead to complications and negative outcomes for patients including complications with airway management, laryngospasms from increased crying and secretions, and motor imbalance, agitation, and restlessness from prolonged oxygen desaturation. Key areas for improvement with anesthesia practice revealed education for providers, families, and children with a focus on communication and a family-centered environment in the preoperative area for parents and children. A preoperative preparation/education program to help patients become more familiar with the hospital and surgical environment can aid parents and children to feel more confident before anesthesia.

Preoperative anxiety has been found to increase the use of analgesics, cause longer recovery stays, delay entry to the operating room, and even longer stays in the hospital in pediatric patients (Chow et al., 2018). All of these factors together not only cause distress for the patient but could also be potential in increasing healthcare costs. The use of effective preoperative interventions can minimize fear in pediatric patients, reduce pain, improve psychological well-being, and increase patient satisfaction scores (Lee et al., 2018). These studies have shown a decrease in anxiety that can occur when the proper tools are instituted at the correct times. The use of multimedia and audiovisual videos is very beneficial to patients undergoing anesthesia. This information provides the pediatric population and their parents/caregivers/guardians with the appropriate knowledge to relieve fears about anesthesia and surgery.

The following literature is a mixture of varied aged groups and not necessarily just pediatrics. The information gained provided vital and useful information as well as confirmed that the use of preoperative education is important in all age ranges.

Booklet Education

Another study conducted by Lee et. al. (2018) focused on an educational intervention to 86 patients who were undergoing spinal surgery. A control group was just given standard education while the intervention group was given an information booklet rich with information including the surgical procedure, the operative environment, and postoperative care. Each group was assessed before education by a State-Trait Anxiety Inventory questionnaire, a visual analog scale, and physical indicators including heart rate, respiratory rate, blood pressure, and cortisol levels. Results revealed a significant decrease in anxiety and pain in the intervention group, however, there was no significance in the physical indicators.

Visits by Preoperative Nurses

A quasi-experimental study was conducted to research preoperative visits by the operating room nurse and assess patient stress levels before surgery (Gürsoy et al., 2016). A sample size of 179 patients undergoing general surgery participated in this study over a six-month period. The OR nurse visited half of the participating patients one day before surgery and collected information from them including questionnaire forms, patient satisfaction scores, and recorded distress levels. The control group had the standard preoperative care the day of surgery as well as an assessment of distress levels. The information gained from the experiment revealed that stress levels were elevated due to fear of the unknown, phobia of anesthesia, and a fear of the operating room environment. The analysis revealed that distress in the perceived group was significantly lower than the control group in the postoperative period. It was the influence of the

OR nurse's visit in explaining the facets of what to expect in the operating room that aided in reducing these levels. This study also revealed some of the most common causes of stress for patients undergoing surgery and how those particular fears can be addressed and minimized.

Preoperative Education with Videos

A quality improvement project was initiated by a nurse to determine if providing preoperative education in the form of an audiovisual format would be effective in lowering anxiety levels in surgical patients (Helms, 2020). A quasi-experimental design was used with two individual groups. One group was composed of the control group which contained 30 patients that received verbal and written preoperative instructions the day of surgery while in the experimental group, an additional 30 patients received the same instructions as well as an informative video tour of the perioperative areas. All 60 of the patients were asked to complete a visual analog scale consisting of 10 items related to their anxiety preoperatively. This was assessed upon arrival and at the end of the preoperative assessment. A paired sample t-test was complete to compare the visual analog scales between the two groups. Findings revealed the control group had a reduction in five of the 10 items on the visual analog scale while the experimental group had a reduction of nine of the 10 items. The researcher concluded that the use of audiovisual components as a form of education proved to be an effective method in reducing preoperative anxiety in patients undergoing surgery.

A quasi-experimental design was used to manage anxiety in patients undergoing surgery with the implementation of a nurse-led video-based educational intervention (Haddad et al., 2018). A total of 99 patients were allocated to either a control group or an intervention group. The control group was given the standard preoperative workup while the experimental group was shown an educational video presented by the nurse about the procedure and expectations of the

operating room. A State-Trait Anxiety Inventory that was assessed on both groups before the intervention, two hours before surgery, and four to six hours post-surgery. Results revealed that after the intervention at both the two-hour and four to six-hour times anxiety levels were significantly decreased compared to the control group. The researchers concluded that the implementation of a pre-procedure educational video that is nurse-led has been found to significantly reduce patient's anxiety levels both preoperatively and postoperatively.

In India, a randomized study was completed on 200 patients preoperatively undergoing surgery to determine if an educational video could aid in relieving preoperative anxiety and decrease hemodynamic monitors, such as heart rate and mean arterial pressure (MAP) (Dias et al., 2016). Before surgery start each patient's anxiety was assessed with the State-Trait Anxiety Inventory as well as the specific vital signs for hemodynamic monitoring. Half of the participants were in a nonvideo group while the other half was in a video group that showed a short clip of the expectations of the operating room. The video clip showed patients being brought into the operating room, having anesthesia monitors attached, intravenous lines secured, and further explaining any other expectations before the start of surgery. The intervention group also was accompanied by the anesthesiologist to provide further education and explain any unanswered questions. They had the opportunity to watch the video again if they felt it was necessary. After the video was showed both groups were assessed hemodynamically and with the anxiety screen again. Results revealed a significant decrease in anxiety scores from 80% to 66% in the intervention group, while the control group's anxiety increased from 82% to 96%. The hemodynamic parameters revealed the following information, baseline heart rate was about the same between the two groups, yet after the intervention, the video group had a 4.87% decrease from the baseline while the control group had a 24% increase from baseline. The MAP increased

by 19.79% in the control group from the baseline while the intervention group decreased 1.96% from baseline. This study also revealed anxiety scores in females were significantly higher than in males. The conclusion of this study revealed that educational multimedia information preoperatively aids in decreasing anxiety and hemodynamic levels in patients and is encouraged to help in improving patient satisfaction scores and perioperative outcomes.

An RCT was conducted at the Pingtung Christian Hospital in Taiwan to determine if introducing an educational anesthesia video could help in reducing anxiety in patients (Lin et al., 2016). One hundred patients were randomly split into a control group and the experimental group. The experimental group viewed an eight-minute video briefing the patient about the expectations of anesthesia whereas the control group only received a standard verbal communication from the anesthesia providers. A Chinese version of the STAI was presented to the patients before anesthetic preassessment, in the preoperative holding area, and then on the third day once the surgery was complete. Results reviewed that individuals in the experimental group had statistically significant lower anxiety levels in the preoperative holding area and three days post-surgery. The researchers concluded the use of the educational video no only reduced anxiety in patients but also aided in increasing patient satisfaction scores.

A double-blind RCT was accomplished at a teaching hospital in rural India over a two-month time period (Kaur et al., 2016b). This study was done to evaluate two different approaches to educating patients about anesthesia and the patient's anxiety levels. Two hundred patients were randomly selected where half were in a control group that was just conducted of a standard interview while the other half was given an informative audiovisual presentation as well as the standard interview. The video allowed the patients to see a view of the operating room and the anesthetic procedure that they would endure. Each group was given the Amsterdam Preoperative

Anxiety and Information Scale before any interview, then reassessed once the interview and video were shown. Statistical analysis was complete to show that patients in both groups had an anxiety reduction, yet the experimental group was significantly more than the control group. With the increased use of outpatient surgical practices, anesthesiologists get less time to spend and interact with patients. With such time-restrained situations, fear and anxiety can be heightened, yet with the incorporation of a short informative video presentation, some of these worries can be reduced and often eliminated.

At two large educational hospitals in Iran, a single-blinded randomized controlled clinical trial was completed to investigate the effects of peer and video training on anxiety levels of patients undergoing procedures in the operating room (Habibzadeh et al., 2018). A total of 120 patients were recruited for this study and were assigned to one of four groups. The first group was a control group without any interventions while the other three groups had an intervention. The remaining three groups consisted of patients receiving either peer-facilitated training, video-based training, and a combination of the two. A Persian version of the STAI was used to measure anxiety levels pre and post-intervention. Before the intervention, there were no differences in anxiety levels amongst the four groups. Post-intervention significant anxiety reduction was discovered in all three intervention groups compared to the control group, yet not a large enough significance between the three when comparing the interventions. The researchers concluded that peer, video, or combined education aids in reducing anxiety in patients undergoing surgery and is recommended for future patients.

Preoperative Class in Person

Bibsey et. al. (2017) conducted a RCT to determine if a preoperative educational class taught by registered nurses (RN) could make an impact in improving satisfaction and reducing

anxiety in patients. A total of 209 patients underwent this 90-minute preoperative educational class discussing surgery and postoperative instructions. The information was presented in various forms such as videos, pamphlets, return demonstrations, and open dialogue. An anonymous survey was given to patients after the class to determine satisfaction. A total of 94% of the individuals that participated found that the class was helpful and 91% stated they felt less anxious and better equipped for surgery.

Final Synthesis of Significant Findings

According to Gursoy et al. (2016) some of the most common causes of anxiety and stress for patients undergoing surgery include fear of the unknown, terror of the operating room environment, and phobia of anesthesia. Reducing these stigmas that are present in a patient's mind can aid in a smoother day in the operating room for the patient and the staff involved with their care. Many interventions within the literature review can aid in concluding that various forms of tools can be used to serve in decreasing preoperative anxiety, yet some are more effective than others.

Literature suggests audiovisual components as a form of education preoperatively benefit patients with an anxiety reduction (Helms, 2020). Informative video tours of the perioperative areas and the expectations of each area during the patient's stay showed decreases in anxiety preoperatively and improved patient outcomes postoperatively in comparison to the control group (Dias et al., 2016). Lin et al. (2016) also saw a statistical improvement with reduction of anxiety when their patients viewed an eight-minute video educating patients about anesthesia and what to expect. An educational video visualizing the operating room and describing the anesthesia procedure was presented to patients and was found to decrease anxiety in patients before surgery; while the associated control group who received standard verbal education of

expectations also had lower anxiety levels but not as significant as the intervention group (Kaur et al., 2016). Other conclusions determined that an educational video presented by nurses exhibiting expectations of the OR was found to significantly reduce anxiety levels of patients both preoperative and postoperatively (Haddad et al., 2018). Another study by Baghele et al. (2019) prepared an informative five-minute video for pediatric patients staging three different phases of the perioperative process. The three phases gave a brief but descriptive depiction of what to anticipate for anesthesia and recovery. These patients had considerably lower anxiety levels in comparison to the control group who received standard verbal education.

Statistics indicate that the fear of anesthesia is the most common worry when children have surgery (Landier et al., 2018). Knowing that anesthesia and surgery is going to occur leaves patients feeling uncomfortable and can create an exhausting mindset which can ultimately affect postoperative recovery. These studies reviewed, continue to shed a light on the importance of educational tools for school-aged patients in reducing anxiety, increasing knowledge, and improving postoperative outcomes. Through thorough research, it can be concluded that the use of a preoperative educational video greatly assists with reducing preoperative anxiety for surgical patients undergoing anesthesia and is recommended for future patients. The most appropriate goal for patients is ensuring their needs are met. The most suitable way to meet their needs and reduce fear and anxiety is implementing a preoperative educational video depicting the phases of anesthesia and perioperative areas. With this execution, patients will feel more adequately prepared, which in turn also reduces stress as children feel more relief. Due to the lack of child life specialists' availability to aid in relieving fears to outpatient surgical patients, this perioperative educational video will eliminate the deficit of education that those experts provide and will be life-changing for patients in the surgical experience.

Given the current organizational infrastructure of not having the availability of child life specialists, this educational video could be easily implemented and be a valued addition to the setting. The only additional resource that would be needed would be the use of a tablet that the video would be shown on. For the project, the educational video was viewed on the project leader's (Doctor of Nursing Practice – DNP student) personal tablet. As the research suggests, the use of audiovisual aids/videos for preoperative education has shown to statistically reduce anxiety in pediatric patients undergoing anesthesia. The employment of this video into the clinical setting will aid in improving outcomes for school-aged children having outpatient surgery. Fear and anxiety could be greatly reduced in this population of patients. Less anxiety could also lead to decreased need for preoperative medications to reduce nervousness as these medications have negative effects on pediatric patients during awakening of anesthesia in the PACU. With reduction in anxiety, these patients could significantly benefit in future encounters in the outpatient surgery setting as their understanding of expectations are clearer.

Framework

Havelock's theory of change was the framework for this quality improvement project. This theory piggybacks off of Kurt Lewin's theory of change and includes six steps (*How to apply Havelocks theory of change in nursing*, 2019). The six steps include (a) building a relationship, (b) diagnosing the problem, (c) gathering resources for change from the evidence, (d) selecting a solution, (e) gaining acceptance of the change, and (f) maintaining the change.

With building a relationship, the project leader, becomes familiar with the environment and studies the need for a change to occur (*How to apply havelock's theory of change in nursing*, 2019). When the problem is addressed the need for change is now known. Anxiety is a common fear amongst pediatric patients undergoing anesthesia. Fear is a known problem that is often

addressed with the use of pharmacological intervention. In diagnosing the problem, it is here where it is determined if a change is actually needed or not. Research has been conducted reviewing the literature to pinpoint the drivers behind these fears that cause anxiety. Fear of the unknown, phobias to anesthesia, and the operating room environment itself have been determined to be driving forces behind anxiety for children undergoing anesthesia (Panella, 2016). Gathering resources needed for change involves the project leader to research and apply evidence-based information to aid in resolving the problem at hand. The key stakeholders such as the chief of anesthesia, preoperative nurses, OR nurses, postoperative anesthesia recovery unit nurses, and child life specialists worked together to develop a solution to aid in the relief of anxiety. Based on research, the use of a preoperative educational video has been shown to decrease anxiety in patients and make them feel at ease before departure for the operating room. The aspects of this video were discussed between the team to determine the most vital points based on research to include, which leads to the selection of a solution. At this point, the project leader must be monitoring the change that is put into place and ensuring that the change is actually occurring. The preoperative educational video was implemented and actively monitored to ensure its value was not being discarded. Staff was periodically available during the study period to address any questions or concerns about the video or assessment tools. Stabilizing the change is the final step. This is when the new change would be made permanent. Now the project is complete, data aided in revealing its usefulness in reducing anxiety. From here, the aim is to see policies be put into place with the department to present the video to all patients undergoing anesthesia to aid in reducing anxiety.

Figure 1. Havelock's Theory of Change - Six Steps Modified for Project

Quality Improvement Model

The implementation of the project was driven by a Plan, Do, Study, Act (PDSA) quality improvement model. The PDSA has been found to be a useful tool that aids in documenting a change and testing the change in various settings. Its systematic process allows a method to be put in place and then gain knowledge on the process, product, or service and determining if it is effective or needs improvement (*PDSA Cycle*, 2021). This model came from Dr. W. Edwards Deming in 1993 that was based off a model from his mentor that was revised and is now the Plan, Do, Study, Act. The cycle begins with the plan step, which identifies a goal for putting a practice into place. The do step puts the elements of the plan into place. Next comes studying where outcomes are observed and measured, and it is determined if the plan is successful or shines light on areas for improvement. The cycle is closed with the act step where the process, product, or service can be adopted into permanent change, abandoned, or altered and run through the cycle again if needed.

The PDSA cycles are often used as a central component in quality improvement initiatives that has been found to be widely used and accepted in healthcare settings (Taylor et al., 2013). If used appropriately, the PDSA quality improvement model has shown to result in substantial improvements in patient outcomes in the healthcare industry. It provides a structure that that allows individuals or teams to initiate change, allows a successful change to be either visualized or aids in identifying if a goal was not met, and helps determine if modifications of the plan need to be made. It is currently a model that is widely used at the project site for QI projects. PDSA works well with small and large projects deeming this an appropriate cycle to follow for this quality improvement project.

The "plan" began with meeting the team of key stakeholders to discuss the need for intervention in outpatient surgery. It has been addressed with the chief of anesthesia in the pediatric hospital that there is a lack of support for patient's emotional needs prior to anesthesia induction. They have also been informed that not having the availability of child life specialists leaves these surgical patients at a disadvantage. The chief of anesthesia, the director of outpatient surgery, and the main operating room child life specialist were all behind and supported the initiation of this preoperative educational video to aid in decreasing anxiety in school-aged patients. The reasons attributed to patient's anxiety about undergoing anesthesia based upon the literature were implemented and addressed in the video. The video was recorded with input from all team members involved. It was imperative that the video was viewed by the chief of anesthesia, the chief of surgery, and the child life specialist for any editing or additional content needed in the video. Once this video was ready for viewing, the "do" phase was employed into the preoperative routine when patients came to outpatient surgery. These children viewed the video in the surgery waiting area before surgery. In the "study" phase, the results were evaluated

to determine that the intervention was effective. Now that the desired outcome has been achieved, it can then be transitioned into the “act” phase to standardize this care across to all patients and their developmental levels. This model aids in determining what it is that is trying to be achieved, if the change yields an actual improvement, and what results will actually change with this improvement ("Plan-do-study-act to Implement Change," 2015). The use of the PDSA aids in identifying a clear objective, proving that this process can be replicated, and avoiding poor outcomes. Refer to figure below for PDSA model.

(*Plan-do-study-act*, n.d.)

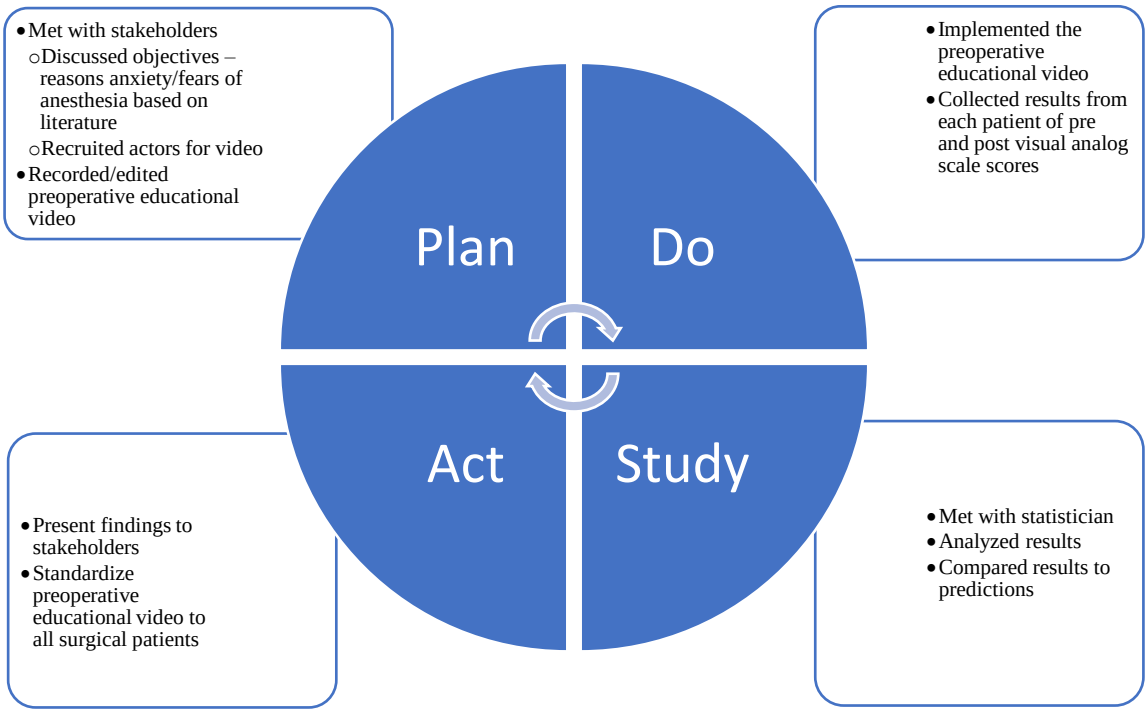


Figure 2. PDSA Model Modified for Project

Specific Aims

The specific aim of this DNP QI project was to decrease preoperative anxiety in school-aged patients about to experience anesthesia induction in the outpatient surgery setting at the project site with the use of an educational video. The process outcome was to utilize a preoperative educational video to inform pediatric patients of anesthesia and the surgical experience. This video was with the assistance of the anesthesia and nursing team. With the PDSA model, the team had the knowledge available from the literature to know what factors cause anxiety regarding anesthesia and address these factors in the informative video. The video was created and edited over a two-day time frame. Implementing this preoperative educational video to school-aged patients about the different perioperative areas they will encounter aligned with the outcome objective to decrease anxiety in these patients. Each patient had anxiety

assessed prior to watching the educational video then immediately after to determine if anxiety levels decreased. After nine weeks of utilization, the overall outcomes were analyzed. Anxiety levels were determined before patients watched the preoperative educational video with a visual analog scale measurement, which is an anxiety level self-assessment instrument. Each school-aged patient took a few seconds to determine their own anxiety levels by rating it on a visual analog scale. This scale was be used due to its ease of use and validity, as it has been used in many studies and proven to be a valid tool for assessment. The six-minute video was shown to the patients and then a follow-up visual analog scale score was obtained again from the patient, in hope that the video caused a reduction in the score from baseline. After nine weeks of implementation of the project, results were reviewed. The results revealed significant improvement in anxiety levels after watching the educational video. Due to the results proving favorable, the lower-level objective includes future coordination with the director to incorporate the preoperative educational video into permanent practice for all school-aged patients in the outpatient setting. Upon the completion of the project, the project leader intends on working with the director of the OR regarding future permanent implementation of the video to all appropriate patients in the outpatient setting.

Setting

The setting of the project took place at a children's hospital in one outpatient surgery center in Northeast Florida. This smaller unit is composed of five unique operating rooms specifically designed for various specialties of surgery. Regardless of the specialty, every case requires the use of anesthesia. The anesthesia department is composed of attending anesthesiologists, certified registered nurse anesthetists (CRNAs), anesthesia assistants (AAs),

resident anesthesiologists, and fellow anesthesiologists. This facility typically performs around twenty surgeries per day with the age ranging anywhere from two to 16.

With the collaboration of the anesthesia department, a comprehensive preoperative educational video was created focusing on pediatric school-aged patients aged six to 10. With the recognition of the lack of education currently available for patients regarding anesthesia, the anesthesia department was in favor and fully supported the implementation of this project. These individuals also played a key role in supporting this project as they aided in how the video was presented in a way that was easy for pediatric patients to understand in alignment with the literature. The assistance of these individuals was crucial as they not only helped with the video but advocated that all of their patients watch this information before induction.

When child life specialists are not available, which is often common in outpatient surgery areas, nurses caring for these children must be adequately prepared and provide developmentally appropriate information to patients to aid in decreasing anxiety (Panella, 2016). Nurses can be properly guided on how to deliver the most age-appropriate care and enhancing the child's capability to cope based on the developmental age during a stressful situation such as surgery. A positive situation for the patient can create a calm atmosphere and in turn, create optimistic future medical encounters. Children aged six to 10 often have better tolerance regarding separation anxiety, yet still have misconceptions about surgery and the various parts that are encompassed with it including anesthesia. In this age group, children have more experience with increased exposure to media and often value peer influence. This group is also found to use visual aids as exceptionally effective in explaining the surgery. It is vital to know the aspects of the patient's developmental levels and how the patient understands best. This aided in determining that the use of a preoperative educational video that includes peers of their own age

was the most effective means of providing anesthesia and surgery information. Videos and media paired with an actor of the same age range allowed the patient to be engaged and feel relatable to grasp the information provided.

When patients present to the hospital on the day of surgery, they are greeted in the waiting area then escorted to a preoperative room. This setting is where patients get prepared for surgery and all consents are typically obtained before leaving for the operating room. It was in the waiting area that all patients within appropriate age frame were be approached the day of surgery to determine participation. Parent/caregivers/guardians were approached by the project leader to inform them about the quality improvement project that was being initiated. The patient and parents/caregivers/guardians were informed about the project and the impact it could potentially make on future care for patients. It was discussed that the use of the video could aid in relieving anxiety in patients with fear about the expectations of anesthesia and surgery. It was also explained if the results prove favorable the use of the video could potentially become a permanent change to aid future patients with anxiety.

Both the parents/caregivers/guardians and patients were properly informed about their participation, informed consent was obtained from the guardians and assent was obtained from the pediatric patients. Participants were ensured confidentially in the QI project. The project leader explained to them that all consents and VAS scores would be stored in a locked cabinet in the nurse manager's office for the entirety of the project. The data that was analyzed did not include a name or date of birth. They were informed that no identifiable information would be disclosed. The last three numbers of the medical record were obtained from the chart and would only be used to identify and differentiate patients. Age, gender, and race were also be used for

analysis to determine the impacts on various individuals. They were informed that once the project was complete the data would be stored on an encrypted drive for five years.

The population that was targeted included patients aged six to 10, both male and female. English was required to be a primary language, as the video was only recorded in English for the project. The child did not need to be required to read as the video did not have written information within it. Length of time for surgery was not a deterrent, all patients meeting criteria and undergoing anesthesia the day of surgery were approached to participate in the quality improvement project. All surgery specialties with school-aged patients having outpatient surgery were included in the inclusion criteria. The only other patients that were excluded were those with possible developmental delays that were unable to answer the VAS score. This information was determined from review of the patient's history and physical in their chart from the patient's primary care provider as well as the parents/caregivers/guardians if there were any developmental delays with the school-aged patient. The target sample size was 100 school-aged patients.

This QI project was presented and approved by JU's institutional review board (IRB) as well as the nursing scientific review committee and the IRB at the proposed project site. The team was extremely impressed by its quality and potential impact for the future of its patients. The chief of anesthesia and surgery of the hospital was also fully supportive of the project and looked forward to its implementation. These strengths proved an immense amount of backing behind the project and forecasting of a successful execution. This project had no impact on the electronic health record.

The workflow of the preoperative area remained the same except for the 10 minutes that the project leader introjected in the surgery waiting area. This was the time that was utilized to

speak to the patients and parents/caregivers/guardians, obtain consents, determine anxiety levels, introduce the video, and reassess the anxiety level. No operating room delay times were be made from the implementation of the project.

Intervention and Measures

The intervention planned to reduce anxiety in school-aged children undergoing surgery with anesthesia included the use of a preoperative educational video. Based on the above literature, of the 14 experimental studies, 10 used some form of video aid in prepping patients for surgery in hopes to reduce anxiety. All of these studies proved a reduction in anxiety with the use of their visual aid preoperatively. All 14 studies used some form of education to enhance knowledge and reduce anxiety preoperatively and did so successfully. Nearly all of the systematic reviews above cited the use of some form of audiovisual education to aid in the reduction of preoperative anxiety and proved the statistical significance of improvement in anxiety. This evidence supports what is best practice for these patients to help in relieving anxiety before induction of anesthesia.

Currently, at the site, there is no use of preoperative education other than anesthesia and the surgeon discussing the process with parents/caregivers/guardians. There are no child life specialists available to aid in relieving anxiety as they are typically utilized in the main operating room. The primary use of anxiety reduction is the use of medication through anxiolytics. After thorough research, it was determined that the use of a preoperative educational video showing three different phases of anesthesia was the most impactful way for patients to feel comfortable before leaving for the operating room and beginning anesthesia induction. The following information includes the content that was contained in the video and the three phases.

The first phase showed the preoperative area as well as the use of certain tools, such as the induction mask or a pulse oximeter and how it can be played within the preoperative area for increased understanding and comfort with these items. It also revealed when the surgeon and the anesthesia provider will come to the preoperative holding area and talk to each patient and parents/caregivers/guardians about the use of anesthesia. The second phase displayed the patient being transported into the OR by the circulating nurse. Once in the room, a view of the operating room was shown with an explanation of the many items displayed. The patient was then shown putting on the anesthesia monitors/tools and the use of the mask to breathe in oxygen. It showed the patient calmly falling asleep. After this phase, the final area revealed the post anesthesia recovering unit. The patient appeared waking up with oxygen and two nurses surrounding their bed aiding in their wake up. It also discussed that soon after their wake up they would be reunited with their parents/caregivers/guardians and be able to drink fluids or eat a popsicle before departure from the hospital. See Appendix A for link to educational video.

There were several actors in the preoperative educational video. They included a preoperative nurse, an anesthesia provider, a surgeon, an operating room nurse, a surgical technologist, two PACU nurses, a patient (a child between the age of six and 10), and an individual posed as a parent/caregiver/guardian. All actors in the video were individuals that currently are employed in the outpatient surgery center, except the patient actor and parent/caregiver/guardian actor. This was vital as these individuals are acquainted with the unit and could be a recognizable face to the patient if they had the opportunity to encounter them. All consents were obtained from these participants before recording the video which occurred during a non-operative day. All actors participated as volunteers and no financial distribution occurred.

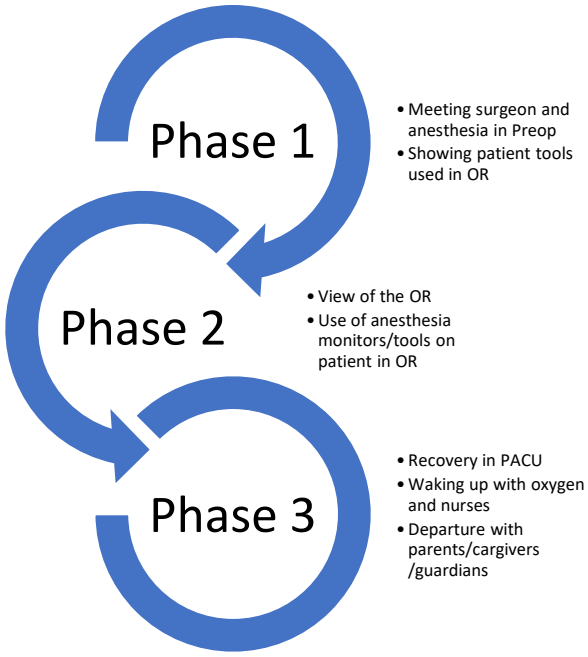


Figure 3. Phases of the Preoperative Educational Video

To determine if anxiety had been relieved a visual analog scale with a score of zero to 10 and ranged faces was presented to all participating patients. This was given to patients before watching the preoperative educational video then immediately after to determine if a reduction in anxiety level was obtained. See Appendix B for VAS tool to assess patients. Of the 20 studies reviewed, 10 of them contained the use of some form of a visual analog scale to determine the emotion of the patient. A VAS is a quick and easy-to-use tool that requires no training (Berghmans et al., 2017). It is a valid tool to aid in detecting preoperative anxiety in patients before the use of anesthesia. The use of the VAS only takes a few seconds to complete, it is easy for patients to understand, and simple to record results.

To obtain the use of this visual analog scale, permission was attained from Edward Dowrick, the author of the visual analog scale, anxiety level self-assessment. As previously mentioned, the VAS is a simple and reliable method to discover anxiety levels in children. It can be useful in children between the age range of two to 16 (Berghmans et al., 2017). Sometimes,

younger children have trouble verbalizing their emotions, utilizing this instrument can easily aid in discovering their feelings without having to express them verbally. The project leader identified the pre-intervention VAS (VAS-I) and after the video intervention, they aided in identifying the post-intervention VAS (VAS-II). VAS I and II scores were obtained from the patients and documented in an Excel data collection sheet that also contained information including age, gender, race, and the last three numbers of the medical record. This data collection sheet remained in the possession of the project leader daily on an encrypted thumb drive that was password protected while all consent forms were stored in the OR manager's locked filling cabinet. The project leader was the sole individual presenting the patients with the preoperative educational video and collecting VAS scores. This ensured internal consistency and validity in the project and its outcomes.

The objective of this QI project was to decrease anxiety in patients undergoing anesthesia and having surgery. By measuring the VAS-I score and VAS-II score, it yielded a change in lowering the score after the preoperative educational video had been viewed. Children fear the unknown; creating and implementing this video allowed school-aged children the opportunity to see what would be happening before it occurred. In turn, their fear and anxiety were reduced aiding in better outcomes postoperatively.

The issues that drive fear and anxiety into patients based on the literature were reviewed with the key stakeholders. These concerns were discussed of how to best resolve these fears with information for patients within the three phases of the video. Within two days a video was recorded with the appropriate actors and edited. This video was be recorded in one day over a weekend when other patients were not in any of these areas to reduce any risk of health insurance portability and accountability act violations. The first phase included the patient,

preoperative nurse, the operating room nurse, the surgeon, and the anesthesia provider discussing the tools used in the OR and all the expectations of the preoperative area. The second phase included the operating room nurse, the anesthesia provider, the surgical technician and the patient. This scene was prepared with an OR setup that is typical of what the patient would see upon arrival into the OR. The patient acted in a way that shows a patient falling asleep calmly while the staff in the room tends to their airway needs. The final phase included the patient, the PACU nurses, and the parent. The view of the PACU was a simple bay with a stretcher and monitor that showed views of the patient being safely observed after surgery. At that point, the parent/caregivers/guardians were shown reuniting with the patient soon after surgery. One day was spent editing and compiling the video to its final product. The final preoperative educational video was then presented to the key stakeholders one week later for final review and approval.

Once the project was approved by the key stakeholders and institutional review board (IRB) for JU and the project site, all preoperative nurses were informed about the project and video implementation. One day was spent ensuring all nurses, child life specialists, anesthesia providers, and surgeons all had the opportunity to view the video and understand its value. The project leader was the sole implementer of showing the preoperative educational video to patients. The sole use of the project leader ensured reliability and consistency of presenting and administering the project. Collection of vital results was also consistent as they administered the VAS the same way before and after each patient's viewing of the presentation. They also ensured all results were secured in the same location each day. This was vital as this is a vulnerable population and the appropriate measures needed to be taken to ensure their privacy.

Every week during the project initiation, the project leader planned to be at the institution for the entirety of the day. They reviewed each patient's age based on the daily schedule

provided, as well as the history and physical in the chart, before discussing the project with the patient to determine if the patient was within the appropriate population for criteria recruitment. Again, this included those aged six to 10, without developmental delay, and English as the primary language. As long as the patient had these three qualifications they were approached for recruitment. The project leader discussed with every qualified patient and parent/caregiver/guardian the project purpose and risks involved with participation. It was then the proper consents and assents were obtained.

The original timeline of the project intervention was three months from implementation. After increased time at the project site, the projected number of participants of 100, was obtained in nine weeks. Once the nine weeks were over, all of the data was sorted and compiled into a data collection sheet. This process was completed in one day for entering/sorting all of the raw data into an excel spreadsheet. Once this was complete, the project leader coordinated with the statistician to determine the analysis of the results. The information that was reviewed included the VAS-I in comparison to the VAS-II. The results showed there was an improvement in scores resulting in a decrease in preoperative anxiety, which was the project's high-level goal. Once the analysis was complete, a write-up began which took one week to document all findings. A final meeting will occur with stakeholders to reveal all of the information discovered concerning the preoperative educational video and its impact on anxiety in school-aged children undergoing anesthesia. At this meeting, the impacts will be discussed about the future use of the video in preparing children for the OR in preop. See Appendix C for Gantt timeline of project.

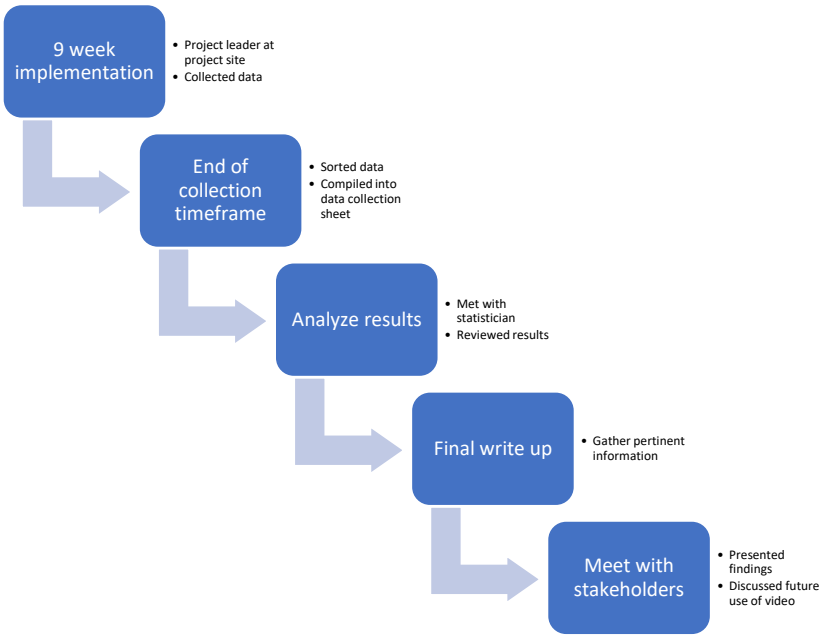


Figure 4. Project Timeline

As results were proved to be impactful, discussions are continuing to be made about a change of process in the preoperative area to include the video in all preoperative education before leaving for the operating room. This project site is a magnet facility and one of the components of being a magnet hospital is being up to date with the most evidence-based practices (EBP). Since research on the use of preoperative educational videos has shown a statistically significant decrease in anxiety along with the positive results of the QI project the organization will want to continue to practice the most recent EBP that is proven beneficial for patients.

The financial costs associated with this project were minimal. The recording of the video was be done by the project leader with the use of a personal recording device; then collaboration was complete with a colleague who is an expert at making videos and compiling them to have a professional appearance, free of charge. The use of the VAS, was with proper permission, was not of any cost. The printing of enough consents and assents was vital. Each parental consent

was seven pages, and the assent was one page. Ensuring that each patient as well as the parent/caregiver/guardian was given their own copy as well as the project leader obtaining a copy totaled to 1,600 pages of paper that was printed. This total expense for paper was $14 while additional ink for the printer was $15.

When the anesthesia department and operating room department have their weekly meetings the project leader took this time to educate these individuals about the upcoming project and show the video in its completion. No additional cost in regard to time was spent as this was presented when employees were already on the timeclock. These departments often look for educational presentations on Wednesday mornings as this is a late operating room start day. The collaboration with the statistician is essentially without additional cost due to their employment by Jacksonville University.

All actors who volunteered for the recording were not be compensated. The use of the operating room, supplies, and tools was donated from the participating outpatient surgery area. Dissemination of findings will be presented at JU at a research symposium, no travel expenses will be needed as this is local, but $100 will be allocated to making a poster presentation. No grants or internal funding were applied for in this QI project, all funding was entirely by the project leader. The time allocated at the project site was immeasurable in relation to cost. Over 210 hours were spent at the project site collecting data during the nine-week period.

The estimates of the resources utilized include time that the volunteers spent recording the video, which was only a few minutes of each volunteer's time. The cost was essentially minimal as the use of the facility was without a fee. The supplies used in the video were all donated from the project site as they were opened and not utilized during business hours, these would have just been discarded had the project leader not obtained them. The use of the

application to compile the video and uploading to YouTube was also without cost. The economic impact of the video is difficult to determine. Regardless of the educational video being shown the patient was likely to have surgery on that day. What is not known, is the future impact it has on the patient and the parents/caregivers/guardians. If the patient and/or the parents/caregivers/guardians gained a relief in anxiety this could positively impact the project site with future revenue. Positive experiences result in repeat patients for future surgeries at a facility. The impact of this video aiding in anxiety relief and comfort in patients before surgery could aid in positive economic impacts for the future of the outpatient surgery center.

Analysis

The specific aim of this QI project was to decrease preoperative anxiety in school-aged patients who were about to experience anesthesia and surgery in the outpatient surgery setting with the use of an educational video. The outcome measures used to determine if the intervention had the desired impact on the problem included the use of the visual analog scale. The VAS-I score was determined from the patient prior to the intervention, the educational video was watched, and the VAS-II was ascertained from the patient to determine if there had been a change in anxiety levels. This quantitative method aided in revealing statically significant results in the implementation of the educational video.

The data analysis included a paired t-test at the 5% level of significance with the normality assumption met. The Wilcox Signed-Rank test was used to compare VAS-I and VAS-II to determine that a statistical significance was achieved. Graphics are also essential to better represent the results from a visual standpoint. A paired profile plot was included to show the impact of the VAS score pre-intervention and post-intervention. A Bland-Altman type plot was

also displayed to plot the different scores of the two measurements against the mean of the VAS scores. With the solid red line indicating the overall average of the X and Y axis.

There was also vital qualitative data that revealed positive impacts of the educational video. Each week the project leader met with the staff, which included the preoperative nurses and patient care technicians at the project site to evaluate any feedback regarding the educational video or patient experiences. Each week valuable feedback was given from these individuals stating that patients and parents/caregivers/guardians had nothing but positive responses from the educational video. The patients would say remarks such as “Oh, this is just like what the video showed me would happen” or information from a parent/caregiver/guardian stating, “I felt so much relief after watching the video, knowing every step of what was going to occur today to their child.” One parent in particular stated, “Why don’t they have this stuff for adults, this is amazing!” Another parent stated how her daughter has extreme anxiety and when she received her preoperative consult such extensive medical terms were used and caused increased anxiety to the patient as well as herself. She was relieved after the project leader presented the educational video to her daughter as it explained everything that would be occurring that day in very simple terms that aided in her anxiety relief per her VAS scores. More parent/caregiver/guardian responses conveyed continuous positive feedback about the use of the educational video. No changes or amendments were suggested in regard to the presentation of the educational video.

A head surgeon of the orthopedic department for the project site reviewed the video and was thoroughly impressed. He stated he would love to be able to utilize the video in the clinic setting and allow the nurses in the clinics to send the educational video to all patients a week before surgery. He emphasized this should be the standard of care for all patients having surgery going forward. He also stated that more educational videos should be created tailoring to

individuals who are going to be admitted after surgery and patients who are currently on an inpatient status that will be having an add on surgery during the day.

Ethical Considerations

When discussing the plans for the project to the institutional review board for both JU and the project site, the significance of the studies was presented, including supporting evidence that these interventions have been completed in other institutions and have proven beneficial to patients. Addressing the topic of working with a vulnerable population was also included in these discussions. Due to this population being children, consent was not only obtained from the parent/caregiver/guardian, but also assent from the pediatric patient. The consent and assent were approved by both JU and the project site IRB. Also, when working with the vulnerable population, it was ensured that those that are non-readers had the consent/assent read to them and they had time for questions. Non-disclosure statements were presented to patients and the IRB board to agree to maintain confidentiality during the project. The data that was collected daily from the project leader was be stored in a lock and key drawer in the nurse manager's office as well as saved on an encrypted thumb drive that was password protected and only accessed by the project leader. The data analysis will be stored on an encrypted thumb drive for five years, then deleted off the hard drive after that time.

The intervention and implementation of the video was focused on patients aged six to 10. These individuals have been found by the literature to properly understand this form of education, hence why they were chosen. It was also required for the individual to be without developmental delay. These individuals were excluded as it could not be fully determined, with a developmental delay if they could properly self-assess anxiety with the VAS, therefore they were excluded to avoid any skewing of results. Individuals that did not speak English were also

excluded as the educational video and consent/assent forms were presented in English. Even if the individual fell in the appropriate age group and was without developmental delay the language barrier could have posed an issue even if an interpreter was available. Information could possibly be misconstrued with the language differences again causing a possible skewing of results.

The demographics of the patients was obtained and included age, gender, race, and the last three numbers of the medical record. There were no identifying factors such as name or date of birth collected. It was also discussed with both IRB boards about the activity that the participants were expected to do. The participants completed a visual analog scale to determine VAS-I, watched a short educational video, then revealed the VAS-II score. The time to explain consents/assents, ascertain VAS-I, present the educational video, and determine VAS-II took approximately 10 minutes per participant.

The results obtained were true to the participant's describing. Their VAS-I and VAS-II scores were recorded based on their definition of anxiety based on the visual analog sale. There was no conflict of interest in the results as the project was determining whether them implementation of the educational video was deemed effective. The consistency of the project leader being the sole implementer of the educational video aided in receiving results that were reliable and valid.

Results

The intervention proposed was an educational video presented to patients in the preoperative waiting room showing eligible individuals aged six to 10 the flow of how their operative day would proceed. After proper consent/assent the project leader assessed every appropriate patient in determining their initial anxiety levels with a VAS-I score. The project

leader proceeded on by showing an educational video to each individual and reassessing anxiety levels post intervention with a VAS-II score. The first day of implementation was a slow start as this was a new role the project leader had taken on and was unfamiliar with. As the days proceeded, the project leader became an expert at approaching patients and their parent/caregiver/guardian. No modifications were made to the video, or the way patients were assessed throughout the project implementation.

Again, the process was measured with a visual analog scale for each patient. Every patient approached the visual analog scale with ease and without hesitation. Their initial score was obtained (VAS-I) as well as their follow up score (VAS-II) after the educational video. Each patient's scores were documented in the data collection sheet as well as their age, gender, race, and last three numbers of their medical record number, although this medical record number was ultimately determined to not have any value in collection.

The outcomes were analyzed by the statistician for Jacksonville University. A convenience sample of 100 participants was chosen for the QI project. There was a total of 122 patients in the appropriate age group, and 100 met the criteria for participation, which included the age of six to 10, English speaking, and without developmental delay. Of the 22 patients not included, 16 patients were of developmental delay, two were due to being Spanish speaking only, and four parents denied due to fear of increased anxiety. Of the participants 54% were male and 46% were female. The ethnicity distribution was 56% Caucasian, 22% African American, 15% Hispanic, 4% Asian, and 3% Middle Eastern. The age distribution was 32% age six, 19% age seven, 6% age eight, 11% age nine, and 32% age 10.

The paired t-test was selected as the appropriate model for the data collected per the recommendation of the JU statistician. The paired t-test showed that the initial mean VAS-I

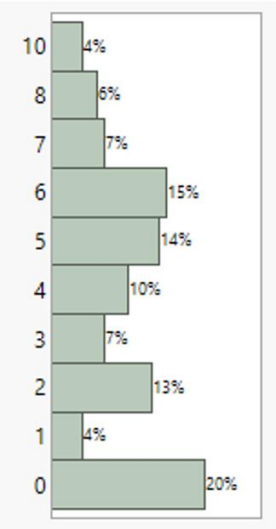
score was 3.88. After the educational video intervention VAS-II scores decreased with a mean score of 2.04. This indicated the VAS decreased by 1.84 on average. An alpha level of 0.05, 95% confidence interval, for the change in VAS was -2.31 and -1.37, that was the average decrease in VAS being between 1.37 and 2.31 ($p<0.0001$, $t = -7.84$ for the paired t-test). This indicated statistical significance in the use of the educational video as VAS scores improved.

Paired t-Test

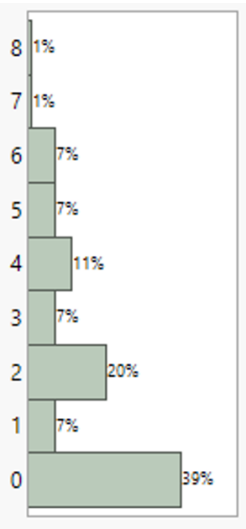
VAS - II	2.04	t-Ratio	-7.83902
VAS - I	3.88	DF	99
Mean Difference	-1.84	Prob > |t|	<.0001*
Std Error	0.23472	Prob > t	1.0000
Upper 95%	-1.3743	Prob < t	<.0001*
Lower 95%	-2.3057		
N	100		
Correlation	0.58268		

The graphs below show the distribution of VAS scores by each individual number that was self-ranked. VAS-I mean score was 3.88. VAS-II mean score was 2.04. Again, this shows an average of 1.84 decrease in score. This information indicated an improvement in anxiety levels after watching the educational video.

Distribution of VAS – I scores



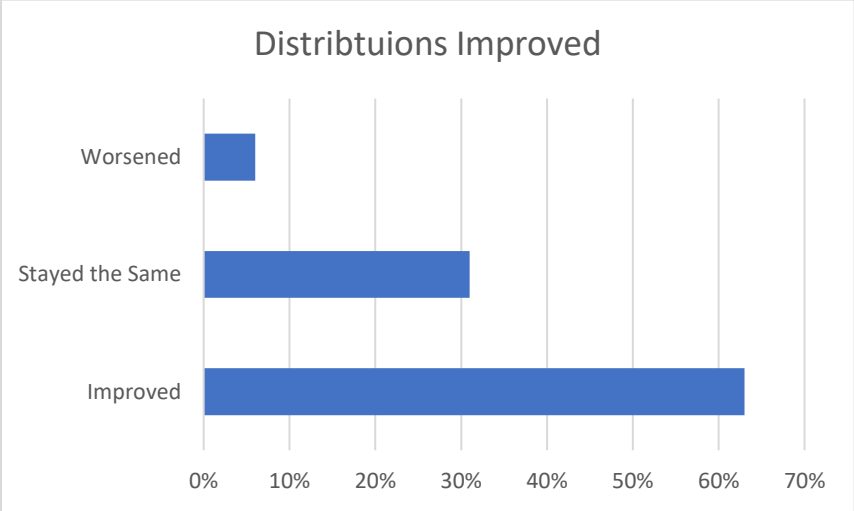
Distribution of VAS – II scores



A confidence interval (CI) was constructed with a 95% confidence level. The CI determines that 95 out of 100 times the below estimates will fall between the upper and lower range. This confidence interval revealed a 63% improvement in anxiety after watching the educational video. It was determined that 31% of patients remained the same in their anxiety level and 6% of patient's anxiety increased. The CI infers that the same values can be expected if the intervention were to be run again the exact same way.

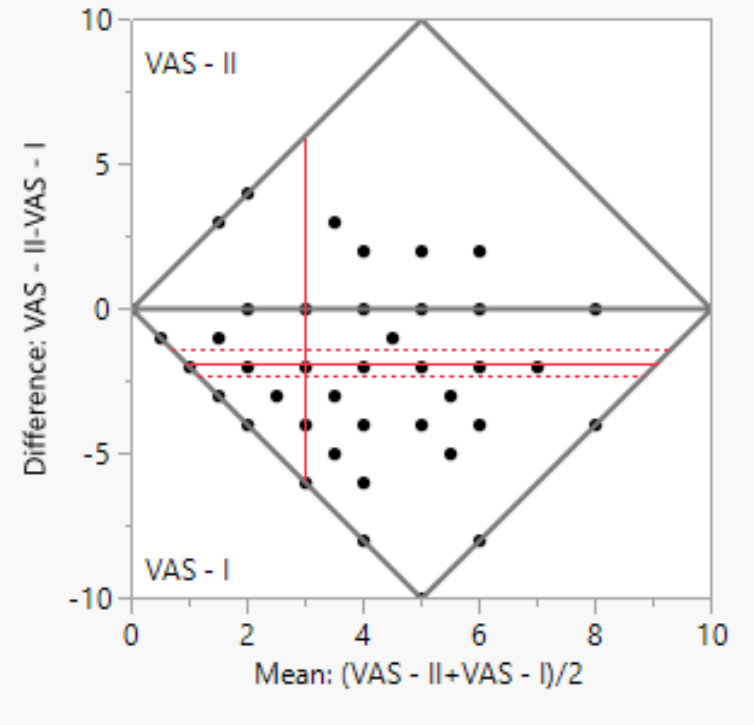
Confidence Intervals

Level	Count	Prob	Lower CI	Upper CI	1-Alpha
Improved	63	0.63000	0.532205	0.718176	0.950
Remained the Same	31	0.31000	0.227797	0.406261	0.950
Worsened	6	0.06000	0.027786	0.124768	0.950



The Bland-Altman type plot gives a good visualization showing that the differences between VAS-I and VAS-II are mostly negative, this can be seen in the plot below. Most plot points are below zero, indicating scores improved, while only six were positive showing these patient's anxiety level worsened.

Bland-Altman Plot



The Wilcox Rank Test (nonparametric version of paired t-test) is used to compare two sets of data that are from the same participants. This would be appropriate as these 100 individuals self-assessed two scores, the VAS-I and the VAS-II based on their anxiety levels before and after watching the educational video. The goal of this test is to determine if the two sets of data are statistically significant from each other. The results indicated $p<0.0001$ which was a significant result and can be inferred that the educational video aides in reducing anxiety.

Wilcoxon Signed Rank

	VAS - II-VAS - I
Test Statistic S	-1901.0
Prob>|S|	<.0001*
Prob>S	1.0000
Prob<S	<.0001*

One of the main contextual elements and influences on the intervention was the preoperative staff. The staff at the project site were extremely accommodating of the project

leader and the intervention in the outpatient surgery setting. Had the staff not been patient with allowing the project leader the 10 extra minutes of allocated time to assessing the patient and showing the educational video, the project may not have been as successful. The project leader having had a previous work relationship with the staff could have been the positive influence on the intervention. Although that relationship with the staff did not skew the results of the VAS-I and VAS-II scores, their allowance for the project leader to continue to work with the patients in the surgery waiting area was beneficial as opposed to calling the patient back to the preoperative area and showing the video once in that phase of their stay. The preoperative staff aided in the project to be successful by permitting the appropriate time to be spent with each patient. This allowed for the QI project to be properly instituted, without interruption, and revealing a statistically significant change in anxiety scores after the educational video.

A specific serendipitous finding in this QI project was the impact and influence the educational video had on the parents/caregivers/guardians. Continuous positive feedback was given by these individuals revealing relief of their anxiety prior to their child undergoing anesthesia and enduring surgery. As previously mentioned, parental anxiety is correlated to their child's anxiety preoperatively (Matthyssens et al., 2020). The institution of this educational video was found not statically significant to patients but verbally expressed as a favorable asset by parents/caregivers/guardians. This can be found to be beneficial to future research on assessing parental anxiety in correlation with their child's anxiety.

The data not included in the quantitative analysis was the last three numbers of the medical record number. Initially these were thought to be useful in the data collection. After the collection time period was complete it was determined these had no meaning or use in the data collection and were therefore excluded in any analysis.

Summary

Surgery is a frightening event, especially for children who have never been exposed to this type of environment. Reducing anxiety and fear in a child's mind was the ultimate goal for this quality improvement project. The deficit of child life specialists to aid in reducing anxiety in this specific setting enforced the need for a QI project such as this to aid in showing the value that education can have on reducing anxiety levels. With the proper evidence at hand supporting the use of multimedia tools to reduce anxiety, better outcomes for patients can and were achieved. The use of this preoperative educational video proved beneficial to school-aged patients undergoing anesthesia and having surgery in the outpatient surgery setting, decreased anxiety, and hopefully allow for policy changes to take effect regarding how patients are prepared for anesthesia the day of surgery.

Interpretation

The intervention that took place was an educational video revealing the different areas of the hospital during an outpatient surgery day. The aim of this intervention was to help in reducing anxiety in patients aged six to 10 by showing each patient what they are going to experience during their stay to help reduce fears of the unknown which is a common distress to patients of this age range undergoing anesthesia and surgery. Literature reveals that the use of education to patients prior to surgery aids in reducing these fears. More specifically, the use of a multimedia tool with education has been shown to be beneficial as this age group can commonly relate to peers in videos and these individuals also find visual aids as being an exceptional way to understand the concepts of surgery and anesthesia (Panella, 2016). The outcomes of the video proved statistically significant with a 63% improvement in anxiety after reviewing the educational video making it comparable to existing literature. The impact of the patient and the

reduction of their anxiety levels is invaluable in the mind of the parents/caregivers/guardians. With many patients showing improvement of anxiety levels, the project is proven to be impactful to patients and the care that they receive at the project site. Not to mention parents/caregivers/guardians expressing relief in knowing not only is their child relieved but their actual anxiety reduction as well.

Research indicated the use of a multimedia educational tool has shown to be beneficial to pediatric patients undergoing anesthesia in aiding in reducing anxiety levels. Prior to implementation of the project, the anticipated overall outcome was to hope to see a reduction in 50% of the patient's anxiety levels. The observed outcomes were more than what was expected. Anxiety levels improved in 63% of patients. Not only were the numbers significant, but physically seeing patients and their noteworthy change in body behavior and facial expressions in a positive way was immeasurable by any numbers but was mentally noted by the project leader as a significant impact that was unquestionable a positive outcome.

The costs of the project were minimal and can be easily replicated again to make further educational videos as needed. The strategic trade-offs of the video were the extra time that was removed from the preoperative area allocated to allowing patients to view the educational video in the waiting area. Typically, when patients check in to the waiting area, they are quickly brought back to the preoperative area to begin their work up for surgery. With the intervention of the educational video the preoperative staff allowed the patients extra time in the waiting area to have the project leader assess the patients, institute the educational video, and reassess the patients. While this allowed less time to prepare patients for surgery in the preoperative area the trade-off included reducing anxiety in most patients and less explanation of upcoming events during their stay.

Limitations

Internal validity was maintained as best as possible, yet still factors exist that could present as limitations. The focus of the QI project was on anxiety levels on pediatric patients aged six to 10 having outpatient surgery. Limiting the focus to specifically outpatient surgeries may have posed as a limitation as these surgeries are generally shorter and not as higher of acuity. With this factor in mind, it is possible that anxiety levels may not have been as elevated than a surgery that is more complex. The target population also focused on patients of a specific age range. This could also have posed as a limitation as younger individuals may not be as concerned with what was occurring that day. In fact, there were a few parents/caregivers/guardians who did not inform their child what was occurring on that day of surgery. Anxiety levels may have been low due to the unknown and even increased after watching the educational video as this was all new information gained in that time period. The shorter time period of nine weeks with only 100 participants could also have posed as a limitation.

Having the project leader as the sole individual implementing the project was a significant effort to help to minimize any limitations. Consistency was maintained on approaching the target population each day at the project site. All appropriate patients were approached with an unbiased view and given the same information each time. All patients were given the same visual analog scale based on gender and reassessed with the same scale. The educational video also remained the same throughout the QI project for all patients.

Conclusions

The importance of this project shows statistically significant reductions of anxiety levels were obtained from the implementation of an educational video in pediatric patients undergoing

anesthesia in an outpatient surgery setting. These reductions could aid in positive outcomes for patients with pain, healing, and discharge. This reduction demonstrates its usefulness in this specific population and why it should become the standard of care for all patients undergoing surgery.

The sustainability of the educational video at the project site location is easily attainable. Currently, the preoperative nurses call each patient's parent/caregiver/guardian two days before surgery to inform them about their upcoming surgery time and instructions before arriving. It is during this time it can be presented to each parent/caregiver/guardian that there is a useful educational video on YouTube that was created and tailored to the project site. It can be explained if the child is having any fear or anxiety that this video is found to be useful in reducing those worries. If each preoperative nurse makes it a point to present this educational video to each patient it can easily be part of their call routine each time. By instituting the information about the educational video at this time it will allow the patient to view the video more than once and aid in further decreasing anxiety. By replicating the idea of having patient's watch a video prior to surgery in the preoperative bays may also be sustainable as each bay has a computer with access to YouTube. The preoperative nurse can assess if the patient presents with anxiety and if present can allow the patient to view the educational video to help in reducing these fears.

The institution of this educational video can certainly be spread to other contexts. The replication of this video can be easily conquered tailoring the information and setting to any facility. With edits in the video and additions it can also be utilized to educate other patients of different ages and various complexities of surgery. It was suggested by the head surgeon of the orthopedic department to create a video specifically for pediatric patients undergoing spinal

fusions as this is a common yet complex surgery that occurs multiple times per week. This type of education could be vital as it often instills great fear in these teenagers.

Studies have supported the use of multimedia education for providing anxiety relief to pediatric patients. This QI project was able to show the impact it made on reducing anxiety levels in these patients undergoing anesthesia and having outpatient surgery. The lack of any preoperative education or child life specialists in the outpatient surgery setting at the project site was clearly identified. The implementation of the educational video helped bridge the gap between the deficit and the need. The educational video helped to explain to each pediatric patient what was going to endure the day of their surgery. This aided in reducing anxiety in 63% of patients. This vital information aides in identifying that the educational video is an effective measure in reducing preoperative anxiety in pediatric patients and should be utilized on patients moving forward.

Many lessons can be learned from the implementation of this QI project. Not all patients are the same and many respond to stressful situations differently. While results showed improvement in anxiety levels, it is believed that further anxiety could possibly be reduced if the video is implemented a week or even days prior to surgery. This would give patients time to watch the video in the comfort of their own home and watch it more than once to truly understand what will be occurring. Future projects could also reveal that the educational video could aid in reducing parental anxiety and in turn have a positive impact on the patient's anxiety as well. Assessing parental anxiety in addition to patient anxiety before and after an educational video could pose as valuable information gained.

Now that the data has been analyzed and results are favorable the findings will be presented at a Jacksonville University research symposium. The information will be presented in

a clear manner that is simple and easy to understand through a poster presentation and tablet presenting the preoperative educational video. The message will leave JU spectators with a well-defined understanding of the project and the results it conveyed. Only factual information will be presented with strong data and data analysis to support the findings. After the presentation, a manuscript will be developed for publication to the Association of Perioperative Registered Nurses (AORN) journal for peer review and submission. Once the final project is complete the scholarly paper will be submitted to the JU site at the Virginia Henderson Repository for other doctoral students to reference for future research and ideas for projects.

Once this is all complete, the final findings will be presented to the key stakeholders that were a part of the project. Now that it is shown that results are found to beneficial to patients, it will be urged that permanent implantation of the use of the video to all preoperative school-aged patients undergoing surgery. Once it is exhibited to the stakeholders, it will then be presented to the IRB board of the project site. It will be advocated by the project leader for a policy change for patients undergoing surgery to view the preoperative educational video before surgery.

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Appendix

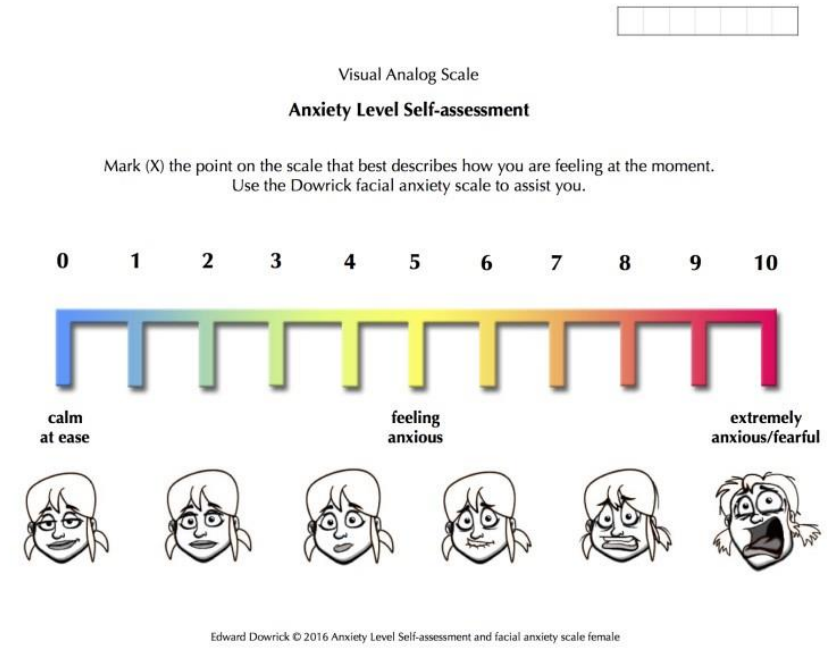
Appendix A

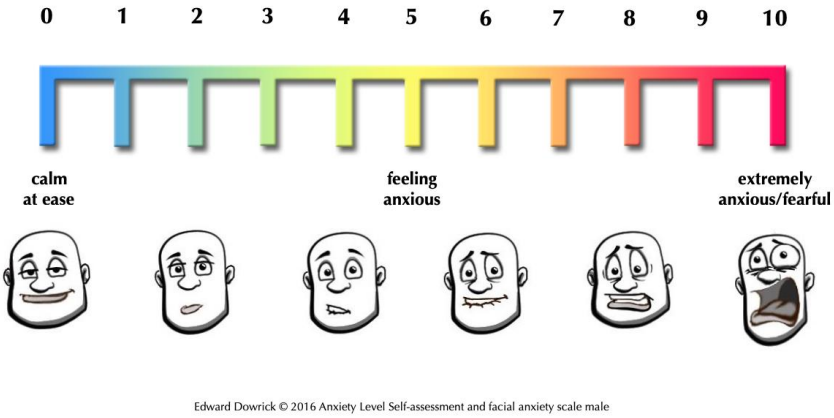
Link to the preoperative educational video formatted for the project site

https://www.youtube.com/watch?v=nioMZNj1vLY

Appendix B

Visual Analog Scale (Dowrick, 2016)





Appendix C

Gantt Timeline of QI Project