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USING A KINDLE TO IMPROVE PARENTAL PERCEPTIONS OF PAIN IN THEIR CHILDREN: A DNP SCHOLARLY PROJECT

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USING A KINDLE TO IMPROVE PARENTAL PERCEPTIONS OF PAIN IN THEIR
CHILDREN: A DNP SCHOLARLY PROJECT

By

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SIGNATURE APPROVAL FORM

USING A KINDLE TO IMPROVE PARENTAL PERCEPTIONS OF PAIN IN THEIR CHILDREN: A DNP SCHOLARLY PROJECT

This DNP Scholarly Project by Andrew Gearhart is recommended for approval by the student's Faculty Chair, Committee and Department Head in the School of Nursing

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Abstract

Patient satisfaction is an important goal for health care providers, as it is associated with treatment success, and patients are more likely to adhere to medical treatments when they are satisfied. Emergency departments are among the lowest ranked healthcare settings nationwide in terms of patient satisfaction. Pediatric patients often experience pain and/or anxiety while in the hospital setting and are at an increased risk of having unpleasant experiences while receiving care. The purpose of this DNP scholarly project is to determine whether the introduction of a Kindle Fire tablet was effective in decreasing parental perceptions of pain while their child underwent an invasive procedure in a rural emergency department. The study is an experimental, randomized controlled trial that utilized a convenience sample of how-many parental dyads. The theoretical framework utilized for this scholarly project is Good's (1998) acute pain management theory. A modified version of the Pediatric Pain Survey (Shahid, Benedict, Mishra, Mulye, & Guo, 2015) utilized a Likert scale and assessed responses to five questions. After the data were collected, a Fisher's exact test of independence was used to compare differences in the distribution of responses, and p values were used to determine the statistical significance while comparing the control and the intervention groups. There was no statistical evidence to indicate that the intervention changed the perceptions the parents had on their child's pain or anxiety.

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July 13th, 2018

Dedication

This scholarly project would not have been possible without the support of my friends and family. I thank my parents for thinking it was possible for me to reach for a level of education which, at that time, seemed unrealistic. I thank my mother, Susan Gearhart, for always being there for me when I needed support, and working hard to ensure we always had what we needed. I thank my father, Robert Gearhart, for showing me how to work hard and fight through any challenges.

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Chapter One

Low patient satisfaction ratings are common in emergency departments (EDs) across the United States (Pines et al., 2008). Patients who are not satisfied often report that their care was inadequate, they were unhappy with their treatment, and/or they did not like their healthcare provider (Zusman, 2012). Patient satisfaction is an important goal for health care providers, as it is associated with the success of the treatment, and patients are more likely to adhere to medical treatments when they are satisfied (Dubina, O'Neill, & Feldman, 2009). It can be difficult to achieve desirable patient satisfaction scores in an ED setting due to variables such as an extended waiting period, painful procedures, and lengthy visits (Goloback, McCarthy, Schmidt, & Adams, 2015; Pines et al., 2008). Some of the primary factors influencing patient satisfaction include the duration of time spent waiting to meet the healthcare providers, perceptions of courtesy from the hospital staff, and the duration of time spent waiting to receive medication for pain (Byczkowski et al., 2013; Forstater et al., 2012; Liversidge, Taylor, Liu, Ling, Taylor, 2015). Emergency departments are among the lowest ranked healthcare settings nationwide, in terms of patient satisfaction (Goloback et al., 2015). In fact, patient satisfaction scores are so low that EDs remain one of the few areas where satisfaction does not factor into reimbursement (Carter, Pouch, & Larson, 2014). However, in spite of these difficulties, healthcare workers should be encouraged to implement evidence-based interventions intended to improve patient satisfaction scores.

Background and Significance

Researchers have identified variables that are associated with increased satisfaction levels in pediatric patients and their parents during ED visits (Forstater, Brooks, Hojat, & Lopez, 2012). One factor, identified by Byczkowski et al. (2013), was courtesy from the staff and healthcare providers. Patient satisfaction ratings increased when they remained courteous to pediatric patients and their parents throughout the ED visit. Similarly, in another study, Forstater et al. (2012) reported that staff and healthcare provider courtesy was associated with an increased satisfaction in ED patients. Other factors found to improve pediatric and parental satisfaction include a decreased waiting duration to see a healthcare provider, hospital staff collaboration, and prompt pain medication administration (Byczkowski et al., 2013; Forstater et al., 2012).

Pediatric patients often experience pain and/or anxiety while at the hospital setting (Byczkowski et al., 2013; Caprilli, Anastasi, Grotto, Abeti, & Messeri, 2007; Kleiber & Harper, 1999). Physiological responses to pain in children include an increased pulse rate, glucose and cortisol levels (Yoo, Kim, Hur, & Kim, 2011). These physiological responses have been associated with elevated anxiety levels and a decreased adherence to medical treatments (Byczkowski et al., 2013; Hamilton, 1995; Yoo et al., 2011).

When children are exposed to pain, they develop an acute memory of the event (Noel, McMurtry, Chambers, & McGrath, 2010). In one study, children who experienced elevated levels of pain after venipuncture exhibited increased anxiety when asked about the same medical procedure two weeks later. In contrast, children who experienced low levels of pain at the time of venipuncture, reported lower levels of anxiety when asked

about the procedure two weeks later (Hamilton, 1995; Noel et al., 2010). Therefore, reducing pain levels in pediatric patients during medical procedures may lead to lower levels of anxiety when they undergo future medical encounters (Hamilton, 1995; Noel et al., 2010). Additionally, the researchers found that parental satisfaction was higher when their child's pain was well-managed (Byczkowski et al., 2013).

Current evidence provides support for a link between lower levels of acute pain and/or anxiety in pediatric patients when distraction devices, such as electronic tablets, are utilized (Benedict, Mishra, Mulye, & Guo, 2015; Burns-Nader, Joe, & Pinion, 2017; Inal & Kelleci, 2011; Shahid et al., 2015; Yoo et al., 2011). Specifically, researchers have found that decreased pain or anxiety was reported in pediatric patients who were provided with an electronic tablet to play with before an acutely painful episode occurred (Bellieni et al., 2006; Burns-Nader et al., 2017; Messeri, Benini, Papacci, & Gangemi, 2010; Shahid et al., 2015; Yoo et al., 2011). In a randomized controlled trial (RCT), Yoo et al. (2011) found that using animation for the purpose of distraction lowered the pediatric patient's pulse rates, cortisol levels and glucose after venipuncture in comparison to a control group that received no intervention. Additionally, researchers found no evidence of risk while implementing electronic-based interventions to patients (Kleiber & Harper, 1999).

Statement of Purpose

The purpose of this DNP scholarly project is to determine whether the introduction of a Kindle Fire tablet was more effective at decreasing the parental perceptions of pain while their child underwent an invasive procedure (venipuncture or injection) in comparison to a control group of children who did not receive a Kindle Fire

tablet prior to undergoing an invasive procedure. Researchers have suggested that distraction devices, such as electronic tablets, may be effective in reducing pain in pediatric patients during invasive procedures (Shahid et al., 2015; Yoo et al., 2011). These devices are cost-effective and have been found to pose little or no risk to patients and their families (Kleiber & Harper, 1999; Shahid et al., 2015; Yoo et al., 2011). In addition, if the distraction device is successful in reducing pain during the invasive procedure, it may lead to increased parental satisfaction. Researchers have indicated that parental satisfaction increases when their child's pain is well managed (Byczkowski et al., 2013).

This project was implemented in an ED setting in a rural, mid-western hospital. Emergency departments in rural settings may not receive as much funding or resources to develop patient satisfaction programs as compared to EDs in urban settings (Hines, Frazee, & Stocks, 2011). Therefore, it may be necessary for healthcare providers in rural hospitals to explore creative and inexpensive methods of improving parental satisfaction scores.

The inclusion criteria consisted of parent dyads, who were presented to the ED, each with a child who was between two to six years of age and was scheduled to receive an injection or venipuncture as part of their treatment. A convenience sample of 14 parent dyads were initially recruited to participate in the study. Out of these, 12 parent dyads completed the study. Participants were randomly assigned into experimental and control groups using an RCT design. The project was conducted over a four-month period beginning in September 2017 and ending in December 2017.

The participants assigned to the experimental group received a Kindle Fire tablet to use as a distraction device while receiving an injection or venipuncture, and the participants assigned to the control group received the usual care prior to receiving an injection or venipuncture. This included verbal reassurance, distraction provided by the patient's parents, or a conversation with the hospital staff through the procedure. After the intervention, the parents' responses to their child's pain were measured using a modified version of the Pediatric Clinic Pain Survey (Shahid et al., 2015). After the data were collected, a Fisher's exact test was used to compare the differences in the distribution of responses and p values were calculated to determine statistical significance (McDonald, 2014).

Theoretical Framework

The theoretical framework utilized for this scholarly project was Good's (1998) acute pain management theory. Good's theory focuses on using three propositions to promote a balance between pain alleviation and the elimination of side effects. These propositions include multimodal intervention, attentive care management, and patient participation. The multimodal intervention proposition evaluates a combination of the following three pain interventions: pain medication, pharmacological adjuvants, and non-pharmacological adjuvants. The multimodal proposition can be adjusted to focus on one or two of the three pain interventions. For example, Good (1998) suggested that pharmacologic adjuvants or non-pharmacologic adjuvants can be used to achieve a balance of analgesia and side effects. The attentive care proposition concentrates on the effect of the interventions, which are monitored through regular pain assessment, the identification of inadequate pain relief, and subsequent reassessment or re-intervention if

necessary. The third proposition, patient participation, focuses on the interventions of patient teaching and goal setting for pain relief.

Good's (1998) theoretical framework ties in directly with the objectives of this scholarly project. Good suggested applying the theory to the research that analyzes the effectiveness of non-pharmacological interventions, such as music, relaxation, and guided imagery to ease the pain. These interventions are often used as distraction methods, as an injection or venipuncture often leads to an acute pain episode in the pediatric patient. Using non-pharmacological interventions, such as an electronic tablet as a means of distraction to reduce pain levels and ultimately, improve parental perceptions of their child's pain, is the primary purpose of this scholarly project. If parents perceive their child's pain as benign, satisfaction levels may increase (Good, 1998).

Chapter Two

Literature Review

The purpose of this literature review was to find articles to support using distraction devices to reduce pain and anxiety levels in pediatric patients. The literature review explored current research on interventions using distraction techniques to alleviate pain and reduce anxiety. Children who reported painful venipunctures exhibited increased anxiety when asked about the same medical procedure two weeks later (Noel et al., 2010).

Cochrane Database, CINAHL, and PubMed were utilized to-acquire articles related to the topic of distraction involving pediatric patients, that were published within ten years from the beginning of the scholarly project. The following were the terms applied to the search; electronic tablet, iPad, Kindle, pain perception, parent's perception, pediatric, distraction therapy, multimodal distraction, television, analgesia, emergency department, walk-in clinic, injections, intravenous, and analgesia.

Patient satisfaction is often low in an ED setting, which results in a decreased likelihood for patients to follow treatment guidelines (Dubina et al., 2009; Pines et al., 2008; Yoo et al., 2011). Literature was also evaluated to look for indications of a relationship between lower levels of acute pain and/or anxiety in pediatric patients with distraction devices such as electronic tablets, when utilized during painful procedures (Benedict et al., 2015; Burns-Nader et al., 2017; Inal & Kelleci, 2011; Shahid et al., 2015; Yoo et al., 2011).

The articles selected for further review were those which were most congruent with the objective of this study. The purpose of this DNP scholarly project was to

determine whether the introduction of a Kindle Fire tablet was effective at decreasing the level of pain a parent perceived his/her child to be experiencing during a venipuncture or injection. The parents' perceptions were compared to a control group of parents who observed their children undergo a similar procedure without a Kindle Fire to play with, as a distraction.

Technology in Healthcare

Technology is becoming increasingly prevalent in the medical realm. Emergency departments and healthcare clinics have started utilizing technology for a variety of purposes. One way is the implementation of electronic devices such as tablets by the ED staff (Kronsell, 2012). Numerous scholars and medical professionals have been interested in their use, to help synergize the often-chaotic ED environment (Mandl & Kohane, 2009).

A limited number of studies have been conducted in evaluating a patient's response towards use of technology while they are in a healthcare setting. Additionally, there are few studies evaluating the benefits of utilizing electronic tablets with patients, while in a healthcare setting. Patient satisfaction is an important goal for health care providers because it is associated with the heightened success of a treatment and an increased probability of adherence to medical procedures (Dubina et al., 2009). As research is currently limited in this area, the literature review required further expansion to include other electronic interventions such as videos, animation, and television, as well as non-electronic interventions.

Russoniello, O'Brien, and Parks (2009) evaluated the effect of playing low-stress, non-competitive video games had on the EEG of 143 college-aged participants.

The results indicated that playing casual video games improved the participants' vigor ($p = 0.018$), decreased fatigue ($p = 0.061$), decreased anger ($p = 0.069$), and tension ($p = 0.026$), when compared to participants in the control group (Russoniello et al., 2009).

The positive physiological responses of reduced stress and increased relaxation associated with casual gaming, provide support to using electronic tablets as a distraction during medical procedures.

Pediatric Patients

The National Hospital Care Survey [NHCS] (2009) collected data from EDs across the United States. In 2009, there were approximately 136 million emergency department visits, with 21% of these patients being under the age of 15 (NHCS, 2009). Therefore, approximately 29 million patients who were evaluated annually in EDs across the United States were pediatric patients, which was a significantly large number of patients at a risk of experiencing excessive discomfort and low satisfaction (NHCS, 2009).

Jang, Kwak, Park, Kim, and Lee's (2015) retrospective study analyzed the factors influencing parental satisfaction regarding their children's care. Data collected from 1,000 parents found, that only 40.2% of the parents were satisfied with their children's care, while in the ED. The study used a seven-point Likert-type scale with one point indicating low satisfaction, and seven points representing high satisfaction.

The survey asked 21 questions related to the potential causes of dissatisfaction. The highest percentage of dissatisfaction was 66.3% for the question inquiring whether the room and staff were child-friendly, which refers to whether attempts were made to lessen the child's fear (Jang et al., 2015). The study also found that the parents of

patients who had lower acuity levels were more likely to be dissatisfied (Jang et al., 2015).

Byczkowski et al. (2013) conducted a retrospective observational study analyzing parental satisfaction with pediatric ED visits. The study consisted of a telephone survey to question 2,442 parents who had recently brought their children to an ED. Closed-ended quantitative questions on a scale of 0-10 for responses, as well as one open-ended qualitative question were utilized, and results found that one of the greatest predictors of parent satisfaction was adequate pain management of the pediatric patient.

Byczkowski et al. (2013) also found that adequate pain management influenced satisfaction in other areas as well, noting that 96% of parents who were satisfied with the management of pain also selected the highest ratings of how they felt physicians and nurses worked together. Pain management had a positive correlation with overall satisfaction, with only 57% of the participants who gave low scores on pain management being satisfied with their ED experience (Byczkowski et al., 2013). The collected evidence supported the researching ideas to improve pain management in pediatric patients, and to expand data regarding the methods to improve patient and parent satisfaction in the ED.

Noel et al. (2010) studied the effect that pain intensity and anxiety had on a child's memory of medical procedures. Forty-eight children, ranging from ages 5 to 10, received venipunctures and self-reported their pain intensity and anxiety, immediately and two weeks post venipuncture (Noel et al., 2010). Participants in the study were asked to complete a one-item faces pain scale as well as a faces anxiety scale (Noel et al., 2010).

Children who rated their anxiety as high during the venipuncture were more likely to have greater anxieties when talking about the same procedure two weeks later ($p = <0.001$) (Noel et al., 2010). Similarly, children who rated their pain and anxiety as low during the venipuncture were more likely to have decreased anxiety while talking about the procedure two weeks later ($p = <0.05$) (Noel et al., 2010). Evidence discovered by Noel et al. (2010) indicated the importance of keeping the pain and anxiety low for pediatric patients to help prevent exaggerated memories about possible medical procedures in future.

In a randomized controlled trial, Burns-Nadir, Joe, and Pinion (2017) investigated the effectiveness of using computer tablets to distract children, aged 4-12, from the pain associated with their second or third round of hydrotherapy. The experimental group were given a computer tablet, while the control group received the current standard of care, including distraction by parents. Children reported their pain levels during hydrotherapy using the 0-5 faces pain scale, with 0 representing no pain and 5 indicating the worst pain imaginable (Burns-Nader et al., 2017). After evaluating the patients' responses, the intervention group was found not to be statistically significant when compared to the control group with a p -value of 0.29 (Burns-Nader et al., 2017).

The nurses caring for the patients at the time of hydrotherapy also completed the faces pain scale for participants in both the intervention and control groups (Burns-Nader et al., 2017). The result of the perceived levels of pain by the nurses was statistically significant with a p -value of 0.03 for the patients who played electronic tablets (Burns-Nader et al., 2017). Therefore, electronic tablets appeared to provide enough distraction

to reduce perceived pain, but were unable to provide evidence of reducing the level of pain that the patients reported.

A meta-analysis was completed by Buratti et al. (2015) to review patients using distraction techniques to decrease pain in pediatric patients during venipuncture. 20 articles matched the criteria set forth by the researchers to be included in the meta-analysis (Buratti et al., 2015). The purpose of the analysis was to determine if distraction could effectively diminish anxiety and stress in pediatric patients receiving venipuncture (Buratti et al., 2015). In addition, the question of the specific techniques being utilized to reduce pain was also explored.

Of the 20 eligible articles, three were systemic reviews, five were reviews, four were RCT, seven were quasi-experimental studies, and one was an observational study (Buratti et al., 2015). Studies were classified into five primary and seven secondary studies, with all primary studies and two of the secondary studies using p -values of less than 0.05 as significant when completing statistical tests (Buratti et al., 2015). Four primary studies found statistical evidence indicating that various distraction methods were effective at reducing pain or anxiety, with a fifth study finding statistically significant evidence for using distraction to reduce stress (Buratti et al., 2015). Evidence of additional positive characteristics were also included throughout the primary studies, such as an increased percentage of successful venipunctures, improved cooperation, and lessened stress in pediatric patients (Buratti et al., 2015).

The secondary studies utilized either p -values or measures of central tendency and Cohen d to support the conclusion that distraction can have a positive effect on pediatric patients while receiving venipunctures (Buratti et al., 2015). For example, throughout the

secondary studies analyzed, statistically significant differences were found in the areas of self-reported pain response, anxiety, mean pain score, and pain intensity after repeated sessions (Buratti et al., 2015). Lab values such as cortisol and glucose can increase when a person is experiencing stress, therefore the reduction of these values provide support for utilizing beneficial distraction techniques to reduce anxiety in pediatric patients (Buratti et al., 2015; Yoo et al., 2011). Glucose and cortisol were found to be lower in groups that were distracted by animations with statistical significance of $p = 0.003$ and $p = 0.043$ respectively (Yoo et al., 2011).

Buratti et al. (2015) noted weaknesses and limitations such as using non-probability sampling, limited quantitative studies and data, and no differentiation between distraction types, throughout their review. Although limitations and weaknesses were noted throughout the meta-analysis, Buratti et al. (2015) determined that the available research corroborated the use of distraction as an effective intervention for decreasing pain and stress during venipuncture.

Electronic Distraction Methods

The Joint Commission recognizes the potential that non-pharmacological pain reduction techniques have, in multiple healthcare settings (Baker, 2017). The Joint Commission recommends that healthcare providers use a multitude of methods for pain control, including distraction, non-opioid approaches, opioids, and adjuvant analgesics (Baker, 2017). Most recently, the Joint Commission has promoted the increase of patient access to non-pharmacological pain treatment methods (Baker, 2017).

In 2012, Bagnasco, Pezzi, Rosa, Fornoni, and Sasso made children, aged 2-15, watch videos when venipuncture was performed. The four-month study, which enrolled

203 participants, which was conducted at an ED and Auxo-Endocrinology department, analyzed the use of a video during venipuncture to reduce pain (Bagnasco et al., 2012). Exclusion criteria for the study included venipuncture within the past three months, health history of mental health disorders, and documented cognitive impairment (Bagnasco et al., 2012).

After detailed study instructions, parental consent was acquired, and a cartoon or video was played for two to three minutes prior to venipuncture (Bagnasco et al., 2012). Next, children rated their pain on a faces scale of 0-10, with 0 indicating no pain and 10 indicating severe pain (Bagnasco et al., 2012). If the child was unable to quantify his/her pain, a 0-10 faces scale was used (Bagnasco et al., 2012). Parents used a Likert-type 0-1 scale to quantify the perceived cooperativeness of their child (Bagnasco et al. 2012).

Bagnasco et al. (2012) processed data, using a z-test with statistical significance found at 99%, and noted differences in the average pain scores between groups, and calculated a mean pain rating for the intervention group of 2.53, or mild pain. When compared to a control group collected from existing literature, patients who received the video distraction reported to have experienced significantly lesser pain, with a *p*-value of 0.000 (Bagnasco et al., 2012). Other findings indicated that only 8% of the parents found their child to be uncooperative (Bagnasco et al., 2012). Study limitations included the reliability of self-reported pain from a child population, and not using a case-control study design (Bagnasco et al., 2012).

Bellinei et al. (2006) utilized convenience sampling at an outpatient laboratory clinic to assess whether watching television and cartoons influenced pain level in pediatric patients. Participants aged between 7-12 years old were randomly divided into

three groups: a control group with no distractions, a group who watched cartoons during a venipuncture, and a group where the participants' mothers distracted them during their venipuncture (Belline et al., 2006). The 69 participants used a Likert-type pain scale consisting of six faces to identify the pain level they felt (Belline et al., 2006).

Pediatric responses noted a mean pain level of 23.04 for the control group, 17.39 for the mother group, and 8.91 for the cartoon/television group indicating the last group identified the least amount of pain (Belline et al., 2006). The patients' mothers rated their perception of their child's pain on a scale of 0 to 100, with the average perceived pain levels being 21.30 for the control group, 23.04 for the mother group, and 12.17 for the television group (Belline et al., 2006). The difference in the means were found to be statistically significant, with the television group having a *p*-value of 0.037. Based on the findings in Bellieni et al., (2006), watching cartoons/TV on an electronic tablet appear to lower the perceived pain that a child is experiencing during a venipuncture.

A quasi-experimental study evaluated the effect of animation on pain response during venipunctures, in preschoolers, aged between 3-7 years, who were patients in the ED (Yoo et al., 2011). Using a convenience sample, Yoo et al (2011) collected pre- and post-venipuncture pain rankings, utilizing a Likert-type scale with poker chips representing pain levels, from 40 individuals. In order to prevent any animosity between the participants, data from the control group who did not receive an animated video was collected in October, whereas data from the intervention group receiving an animation to watch during their venipuncture was collected in November (Yoo et al., 2011).

Significantly lower pain was reported by the patients in the experimental group in comparison to the control group. Physiological responses to pain including heart rate,

blood pressure, cortisol levels, and glucose levels were also measured, and results indicated that watching an animated video was an effective distraction in all areas, including p -values of $p < 0.01$ for behavioral pain response, $p < 0.05$ for heart rate, and $p < 0.1$ for serum cortisol levels (Yoo et al., 2011).

Maclaren and Cohen (2005) evaluated different distraction techniques in an RCT with 88 children ranging in ages between 1-7 years during venipunctures. Participants were assigned to one of three groups: active toy playing, passive movie watching, and a control group (Maclaren & Cohen, 2005). Each group was assessed on their visualized responses during venipuncture, as well as children aged over four years reporting their pain level, and caregivers reporting their perception of child's pain (Maclaren & Cohen, 2005).

When patients were reporting their own distress, Maclaren & Cohen (2005) found passive movie watching to be the most beneficial intervention with a mean distress score of 3.08, compared to a mean of 4.19 in the toy group and 4.21 in the control group. A similar trend was noticed in the mean for the distress level as reported by the caregivers and nurses with means of 73.23 and 52.60 for the control group, 47.56 and 46.83 for the movie group, and 58.48 and 55.36 for the toy group (Maclaren & Cohen, 2005). The difference in the distress levels between the movie group and the control group as reported by the caregiver was significant, with a p -value of $p < .01$ (Maclaren & Cohen, 2005).

Shahid et al (2015) found electronic tablet devices, like a Kindle fire to be significantly reducing the level of perceived parental pain that pediatric patients experienced during vaccinations. Participants were acquired through a convenience

sample, and consisted of the parents of 103 children, aged between two to six years, who were receiving vaccinations at a pediatric office (Shahid et al., 2015). The children of participants in the intervention group were given an iPad during their vaccination (Shahid et al., 2015). The children of participants in the control group received the distraction methods typically used by the clinic, which included reading a book, playing with a pinwheel or toy, or blowing bubbles (Shahid et al., 2015).

The study focused on improving parent satisfaction by decreasing the pain levels during their child's injection (Shahid et al., 2015). Immediately, after their child received an injection, parents completed a six-question survey with a five-point, Likert-type scale to measure their perception of their child's pain and distress (Shahid et al., 2015). The six questions presented by Shahid et al. (2015) dealt with the anxiety levels, uncooperativeness, whether the child cried or had to be held down, pain/distress levels, and the helpfulness of staff during the injection.

Regarding fear and anxiety, the median score was 3 for the control group and 2 for the intervention group, which is a statistically significant p -value of .0060, indicating that the use of tablets were able to lower perceived fear and anxiety (Shahid et al., 2015). Responses to pain/distress levels and whether the child cried or had to be held down during the vaccinations were significantly better in the iPad intervention group with p -values of 0.0695, 0.0205, and 0.0004 respectively, noting that the intervention was effective at reducing pain and anxiety when compared to the control group (Shahid et al., 2015). The methods and model in the study by Shahid et al. (2015), are a paradigm for the pilot study completed throughout this scholarly project.

Non-Electronic Distraction Methods

Distraction techniques for acute pain management other than electronic devices have been explored in research by healthcare providers. Canbulat, Inal, and Sonmezer (2014) used a prospective RCT to evaluate the effect of cards and a kaleidoscope on distracting 188 pediatric patients aged between 7-11 years during a blood draw. The children were divided into three groups: a control group, a group distracted by a kaleidoscope, and a group of children distracted by cards (Canbulat et al., 2014). The researchers measured the perceived pain and anxiety from the children's caregivers using the Children Fear Scale (Canbulat et al., 2014).

Reported pain levels in the intervention group ($p = <.001$) were less than the kaleidoscope group ($p = 0.004$), and both were less than the control group ($p = 0.005$). Anxiety was also lower in the kaleidoscope and cards group, with a p -value of 0.004 and <0.001 respectively, while the control group noted $p = 0.005$ (Canbulat et al., 2014). Therefore, while both interventions appeared to lower anxiety and pain, cards were found to be more statistically significant at reducing the perceived anxiety and pain during a blood draw (Canbulat et al., 2014).

Topical analgesics can act as a pain blocking method for pediatric patients before venipunctures (Waterhouse, Liu, & Wang, 2013). Waterhouse et al. (2013) placed 95 pediatric patients ranging in ages between 9—18 years into two separate groups; one that received vapocoolant spray before venipunctures, and one that had an ice pack topically applied. A Wong-Baker Faces scale was used to have the participants, a researcher, and two physicians who reviewed a videotape of the procedure, assess the patient's pain at baseline, during the administration of a vapocoolant spray or an ice pack, and during venipuncture (Waterhouse et al., 2013).

Based on the responses to the faces scale, the median pain score during venipuncture was lesser with the administration of the vapocoolant spray when measured by the participants, the researcher, and the physicians (Waterhouse et al., 2013). Seventy six percent of the vapocoolant group felt that the procedure went well and that the intervention was effective, while only 46% of the ice pack group felt that the procedure went well (Waterhouse et al., 2013). When participants were asked if they thought the intervention was effective, Waterhouse et al. (2013) used a Wilcoxon Rank Sum test to report a p -value of 0.0167 in favor of the vapocoolant.

Baxter, Cohen, McElvery, Lawson, and Baeyer (2011) explored the capability of vibrations and a cold temperature to alleviate the pain experienced by pediatric patients during venipunctures in an ED setting. Using an RCT method with a convenience sample, 94 patients were placed into either an intervention group who were given a vibrating cold pack called Buzzy Bee, or a control group who used the standard ED venipuncture practice of applying a topical 4% lidocaine application (EMLA cream) to prevent any pain prior to venipunctures (Baxter et al., 2011). Participants and parents used a five-point faces scale to measure self-reported or perceived pain and anxiety during a venipuncture (Baxter et al., 2011).

The Buzzy Bee reduced perceived and self-reported pain at a statistically significant level as compared to the EMLA cream (Baxter et al., 2011). With a confidence interval at 95%, the difference of medians between the two groups had a p -value of 0.029 for self-reported pain and 0.005 for parental perceived pain (Baxter et al., 2011). The positive results found by Baxter et al. (2011) provide evidence of electronic

distraction methods such as Buzzy Bee, as being effective in reducing the pain and perceptions of pain during invasive procedures.

Literature Review Summary

A review of the literature supports the use of distraction as a valid means of acute pain relief for pediatric patients (Buratti et al., 2015; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011). Distraction helped in alleviating various types of pain, such as pain from injections, venipunctures, hydrotherapy, and intravenous therapy (Buratti et al., 2015; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011). When reviewing specific types of distraction methods, many interventions utilizing electronic and audio-visual entertainment devices were found to be statistically effective at decreasing self-reported or perceived pain by a variety of pediatric patients, parents, and healthcare providers (Bellinei et al., 2006; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011). The data indicates that television, playing videos, and providing an electronic tablet such as an iPad or a Kindle are types of audio-visual entertainment that may reduce pain perception (Bellinei et al., 2006; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011).

Non-electronic means of distraction were found to be effective in decreasing pain and the perceptions of pain in pediatric patients, parents, and healthcare workers. Methods found to be effective included cards, vibration, and cold therapy (Baxter et al., 2011; Canbulat et al., 2014; Waterhouse et al., 2013). The effectiveness of a wide range of devices and strategies supports the capabilities of various distractions as being able to reduce pain during invasive procedures.

Evidence collected throughout the review of the literature suggest that the use of distraction methods is also associated with physiological benefits (Russoniello et al., 2009; Yoo et al., 2011). Yoo et al., (2011) discovered decreased cortisol and glucose levels after electronic distractions using animation. Another physiological response to audio-visual stimuli was the triggering of the relaxation areas of the brain measured by an EEG (Russoniello et al., 2009). Current literature supports the multiple benefits that electronic-based interventions can have on pain levels and distress in pediatric patients as well as parents' perception of pain and anxiety during invasive procedures. This indicates the need for further research to investigate cost-effective methods of pain reduction (Buratti et al., 2015).

Theoretical Framework

This scholarly project utilized Good's theory of acute pain management as the theoretical framework (Good, 1998). Good's theory of acute pain management is a middle-range theory that focuses on the balance between analgesia and the reduction or elimination of side effects (Good, 1998). Good's theory proposes that there are three theoretical propositions and eight interventions which can help in achieving this balance (Good, 1998).

Finding a balance between the side effects and analgesia is crucial to ensure the effective treatment of patients and the reduction or elimination of negative side effects (Good, 1998). The three propositions in Good's (1998) theory of acute pain management are multimodal intervention, attentive care, and patient participation (Good & Moore, 1996). Each of the propositions focus on different interventions to balance analgesia and side effects (Good & Moore, 1998).

Good (1998) identified what type of research would align well with her three propositions. The attentive care proposition supports research evaluating one of following three interventions: regular pain assessment, identification of inadequate relief or excessive side effects, and reassessment or reintervention (Good, 1998). Projects that align with the attentive care proposition could include the effect of scheduled pain reassessment on pain management and health outcomes. The close patient monitoring has an effect on repeated pain interventions regarding pain levels, or studies reviewing the role of pain assessments during rest or activity (Good, 1998). The attentive care proposition was not a component utilized during the pilot study.

The patient participation proposition component of Good's (1998) theory is more education-based than the other two propositions. Being composed of only two interventions, the patient participation proposition theorizes the connection between patient teaching and goal setting, with the balance between analgesia and side effects. Good (1998) recommends applying this proposition for projects evaluating the effect teaching patients about painful procedures has on pain levels in patients, as well as how goal setting for pain relief influences healthcare outcomes. Patient education interventions could also examine the relationship between educating patients on pain control methods and the effectiveness of the pain control used (Good, 1998). The patient participation proposition was not a part of the pilot study.

The multimodal intervention proposition in Good's (1998) theoretical framework is applicable to this scholarly project. The multimodal intervention proposition is broken down into three potential interventions: pain medications, pharmacologic adjuvants, and non-pharmacologic adjuvants (Good, 1998). Regarding pharmacologic adjuvants, Good

(1998) recommends designing projects to evaluate the effect of supplemental medications on eliminating the side effects of pain medication. These supplemental medications could include Zofran to reduce nausea prior to opioid administration, and administering non-opioids such as NSAIDs and acetaminophen to reduce patient pain when used in conjunction with opioids (Good, 1998).

Good (1998) suggests that researchers use the intervention of non-pharmacological adjuvants to evaluate the effects of these non-pharmacological methods at reducing the side effects of pain medications, amplifying pain medication in pain management, or reducing pain independently (Good, 1998). The portion of non-pharmacological adjuvants intervention of the multi-modal proposition was the principle component of Good's (1998) theory employed while conducting this pilot study.

The intent of using Kindle Fire as a distraction was to balance analgesia in the pediatric patients without causing side effects, and act the same as non-pharmacological interventions discussed in Good's (1998) theory of acute pain management. Children of the participants in the intervention group received a Kindle Fire to interact with, as an attempt to balance analgesia, while avoiding any negative side effects. Parents ranked their perception of their child's pain to evaluate whether the Kindle Fire facilitated the balancing of analgesia.

Good's (1998) theory was created using the Agency for Healthcare Policy and Research guidelines, and provided clear indications for nursing practices related to pain management. Application of Goods (1998) theory, specifically the non-pharmacology intervention, is appropriate for use in this scholarly project as it focuses on acute pain management. Good (1998) notes that the creation of a nursing theory was crucial to

further the science of acute pain management. This is due to the arrival of increased research regarding pain management in the healthcare setting. The multimodal portion of the theory was also designed to support evidence on the effectiveness of non-pharmacological interventions (Good, 1998).

Non-pharmacological interventions such as those suggested in Good's (1998) theory are crucial for investigation with the rise of complementary and alternative medicine in the United States (USDH, 2008). The use of non-pharmacological pain interventions has increased since 2002 by over 2%, and the methods utilized could include diet, acupuncture, guided imagery, and exercise among many others (USDH, 2008).

Good's (1998) theory of acute pain management was not intended for the evaluation of analgesia regarding the children in pain. The pilot study measured the perceived pain a child was experiencing and relied on adults to complete the survey. While the children received the intervention of the Kindle Fire, the participants were the parents. Therefore, the pilot adapts Good's (1998) theory to measure the children's perceived pain. This theory will be utilized to illustrate the relationship between non-pharmacology adjuvants and effective pain management which may improve increased satisfaction and increased compliance leading to positive patient outcomes.

Chapter Three

Methods

Purpose and Sample

The purpose of this DNP scholarly project was to determine whether the introduction of a Kindle tablet was more effective at decreasing parental perceptions of pain while their children received an invasive procedure (an injection or a venipuncture) in comparison to a control group of children who did not receive a Kindle tablet prior to an invasive procedure. The inclusion criteria consisted of parents of pediatric patients—ages ranging from two to six years—who received an intramuscular injection or a venipuncture at the hospital ED. Patients were eligible only if they were triaged as having a non-critical health status. Those classified as “urgent” or “emergent” were not qualified for participation in the study (see Appendix G for the triage policy).

The hospital used an electronic medical record called T-System to collect the patients’ health information (T-System, 2018). T-System was used to identify participants who met the inclusion criteria, and by the end of the data collection period the population size was determined as comprising 55 participants. A sample size calculator was used to identify the sample size required to obtain adequate power for the study (Survey Systems, 2012). With a confidence level of 95% and a 5% margin of error, it was determined that a minimum of 48 participants was required.

Project Approval

An expedited approval was obtained from the Institutional Review Board (IRB) at the university, and hospital approval was received from the director of nursing as well as the hospital risk assessor (see Appendices A and F for approval letters). Data were

collected from September, 2017 until December, 2017. Participation in the study was voluntary. Parental consent was obtained prior to the study by using a consent form created by the student researcher. This form was approved, prior to the start of the study, by the IRB. Appendix B contains the consent form that was used for the study.

Design and Randomization Procedure

The study was an experimental, randomized controlled trial. Participants were randomly placed into experimental and control groups based on their children's hospital visit identification number. This number is assigned to patients upon their arrival to the ED and it is not possible to either manipulate or alter the number. Those who were assigned a visit identification number ending in an even number were placed in the experimental group, and those who were assigned a visit identification number ending in an odd number were placed in the control group. Children in the experimental group received a Kindle tablet and were encouraged to play with it while they received the injection or venipuncture, and the children in the control group did not receive a Kindle tablet while they underwent the same process. Otherwise, the control group's children received the usual care which included access to books, television, and toys.

Procedures

Prior to implementation of the scholarly project, the nursing staff at the ED received training, from the student researcher, regarding process for obtaining written consent from the parents, the randomization protocol, and data collection methods. The training occurred either on a one-to-one basis or with small groups. Due to a large population of patients, the nurses were limited in their ability to seek out participants and collect data.

Participants who met the inclusion criteria were approached by the student researcher and asked whether they were interested in participating in a study. Prior to receiving consent, the student researcher provided information about the nature of the study, including a description of the risks and benefits associated with participation. Once both verbal and written consent was obtained from the parents, children within the experimental group received the Kindle and were given access to pre-loaded, age-appropriate games and cartoons.

Kindles are hand-held, multi-use electronic tablets which are marketed for the public by Amazon (Amazon, 2011). They have a seven-inch display that utilizes touch screen technology and can be used to download and play games, read books, listen to music, and access the Internet. Parental settings were utilized in order to ensure appropriate use of the Kindle tablets. For example, Internet, camera, and application purchases were blocked through parental controls. Patients in the experimental group were encouraged to play games, such as: Fruit Ninja, Angry Birds, and Temple Run, along with cartoons which included the following: Teenage Mutant Ninja Turtles, Peg + Cat, Simple Songs for Kids, Paw Patrol, and Sesame Street. Children in the intervention group were encouraged to play the games and watch the cartoons while they received the injection or venipuncture, and the children in the control group received the usual care including access to books, television, and toys during the same process. Furthermore, the Kindle was purchased by the researcher using personal money; neither grants nor financial aids were acquired for completion of the study.

Measures

After the intervention, the parental dyads in the experimental and control groups completed a modified version of the Pediatric-Clinic Pain Survey (Shahid et al., 2015). The original survey was developed by Shahid et al. (2015) in order to measure the parental perceptions of pain in their children during a vaccination process. Permission to use the survey was obtained from Dr. Shahid (see Appendix E for email correspondence).

The survey for the scholarly project was modified from the survey created by Shahid et al. (2015), in the following ways: (a) survey item, *injection location* was removed; (b) survey item, choices of alternative distraction methods, such as reading a book or playing a game, was removed; (c) survey item, “*My child needed to be held down while receiving their shots*” was removed; (d) the method of age selection was changed from multiple choice to a written response; (e) survey item, “*My child was fearful or anxious while receiving their shots*” was changed to “*My child was stressed or anxious while receiving their injection/ IV*”; (f) survey item, “*Overall, how satisfied were you regarding your child’s pain control during their shots?*” was changed to “*Overall, how helpful were staff during your child’s injection/IV?*”; and (g) a comment section was added to the survey. Neither the original nor the modified surveys were tested for either reliability or validity (Appendices C and D).

The modified survey included a demographic section in which respondents were asked to answer questions about gender, age, race, the number of injections or IV’s received on that particular day, and whether a distraction technique had been used while a child received an injection or an IV. Parental perceptions of their children’s pain were assessed using five items on the Pediatric-Clinic Pain Survey. Participants were asked to rate the following statements regarding their respective children’s responses during their

care: (a) “*My child was stressed or anxious while receiving their injection/ IV*”, (b) “*My child was uncooperative while receiving their injection/ IV*”, (c) “*My child cried while receiving their injection/ IV*”, (d) “*My child was distressed and in pain while receiving their injection/ IV*”, (e) “*Overall, how helpful were staff during your child’s injection/IV?*”. A 5-point Likert-type scale was used to assess the responses with items ranging from 1 (*not at all*) to 5 (*extremely*).

At the end of the survey, there was a section where parents or guardians were encouraged to provide open-ended responses about their perceptions regarding the care that had been received. They were asked “to provide any additional comments pertaining to the care your child received or the distraction technique utilized”. All of the comments were documented by the student researcher.

The nursing staff instructed study participants to return the completed surveys before being discharged from the ED. Thereby, surveys that were mailed to the hospital or submitted at a later date were not accepted. After the completion of each survey, a nursing staff member marked it with a “C” indicating a control group participant and an “E” indicating an experimental group participant. To protect their privacy, the identification numbers of patients were not included in the surveys. Thereafter, the completed surveys were placed in a locked collection box kept by the physicians’ desks in the ED. The surveys were transferred from the collection box to a locked file cabinet on a weekly basis by the student researcher. All of the research materials and data will, hereafter, remain in the locked file cabinet and will be destroyed after seven years.

Data Analysis

R software was the statistical program which was used to analyze the data. A statistician was consulted for the scholarly project. Moreover, demographic and descriptive data were analyzed using means, standard deviations, and percentage values. Next, the Fisher's exact test of independence was used to compare the differences in the distribution of responses between the experimental and control groups for each item within the survey (McDonald, 2014). This test is often used with small samples and serves as an alternative to the Chi Square test (Freeman & Campbell, 2011)—responses from survey items are placed into a contingency table and the scores for each row and column are summed up. It assumes that the total scores of the rows and columns remain fixed and determines how unlikely it is for the responses to have the same distributions across the groups (McDonald, 2014). Following the results of the aforementioned test that was used, an inference was made as to whether the utilization of Kindle tablets helped improve parental perceptions of their children's pain during the invasive procedure.

Chapter Four

Results

Chapter four includes a presentation of the data results, a discussion and interpretation of the results, the implications on practice, and recommendations for future research. After four months of data collection, surveys from participants were analyzed using measures of central tendency and Fisher's exact test. Tables and data plot figures were used for visual representation throughout the portion of this scholarly project which dealt with the results. The summary and interpretations from the analysis are delineated below.

Demographic Results

Due to the young age of the pediatric patients receiving either the control or the intervention, it was determined that they may lack the cognitive development required to accurately complete the survey. As a result, the parents of the patients completed the surveys. The Pediatric Pain Survey (Shahid et al., 2015) evaluated the parents' perceptions of their children's satisfaction, anxiety, pain, as well as the staff's helpfulness during an injection or a venipuncture. Since the sample was a convenience sample, it did not count as a true randomized representation of the population.

During the four-month duration of the study, there were 55 parents of patients who qualified to participate in it. Out of these 55 parents, 14 parental dyads agreed to participate in the study. From the 14 surveys which were distributed to the parents, only 12 were completed. Therefore, 21.81% of the potential candidates were included in the study. Due to the small sample size that limited the statistical analysis, an extensive

exploratory data analysis was performed. This included comparisons of the distributions of responses for each question between the control and experimental groups.

The parents who completed the surveys provided demographic information on the respective children who were receiving the injection. Demographic characteristics included gender, age, and ethnic group. All of the 12 participants identified their respective wards as being “White”. Six of the participants were male and the other six were female, which resulted in an even distribution of gender. Since the control and intervention groups were randomized, there was a different male-to-female ratio within the two groups. In the intervention group, 57% of the participants were male while 43% were female. In comparison, 60% of the participants in the control group were female and 40% were male.

Descriptive Statistics

After completing the demographic questions, participants were asked to rate the following statements regarding their children’s responses during their care: (a) “*My child was stressed or anxious while receiving their injection/ IV*”, (b) “*My child was uncooperative while receiving their injection/ IV*”, (c) “*My child cried while receiving their injection/ IV*”, (d) “*My child was distressed and in pain while receiving their injection/ IV*”, (e) “*Overall, how helpful were staff during your child’s injection/IV?*”. A 5-point Likert-type scale was used to assess the responses with items ranging from 1 (*not at all*) to 5 (*extremely*). Figures 1 and 2 display the distributions of responses for these survey items by gender, as given below.

Figure 1 Male Response Percentages to Individual Survey Items

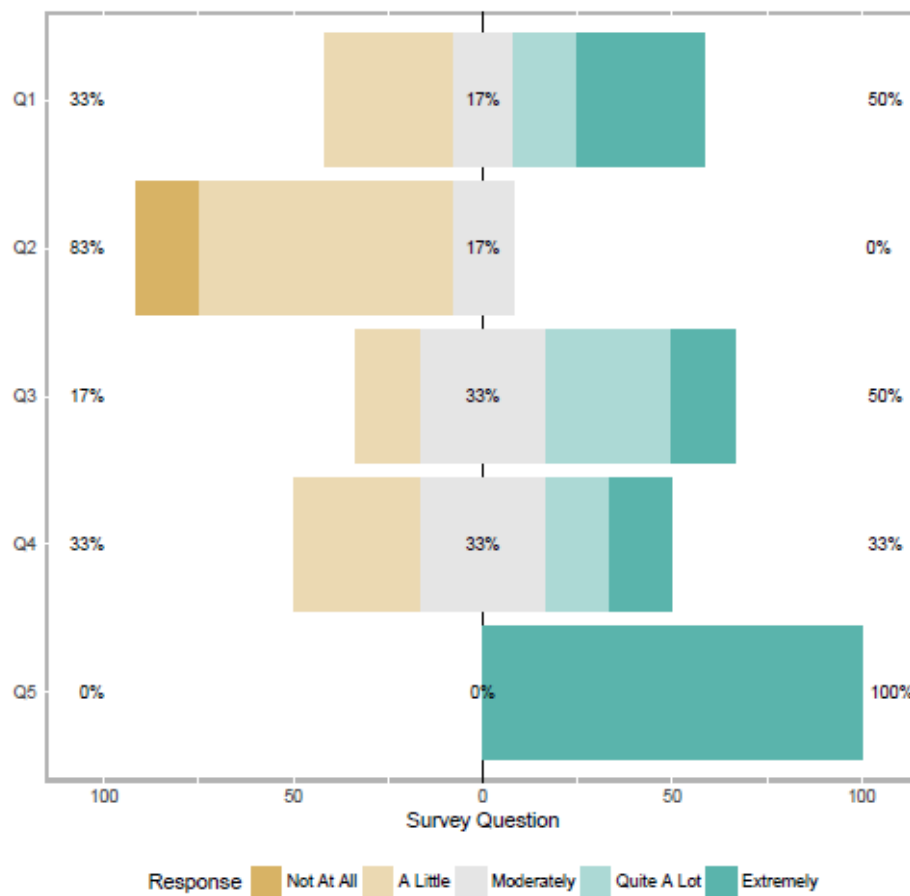
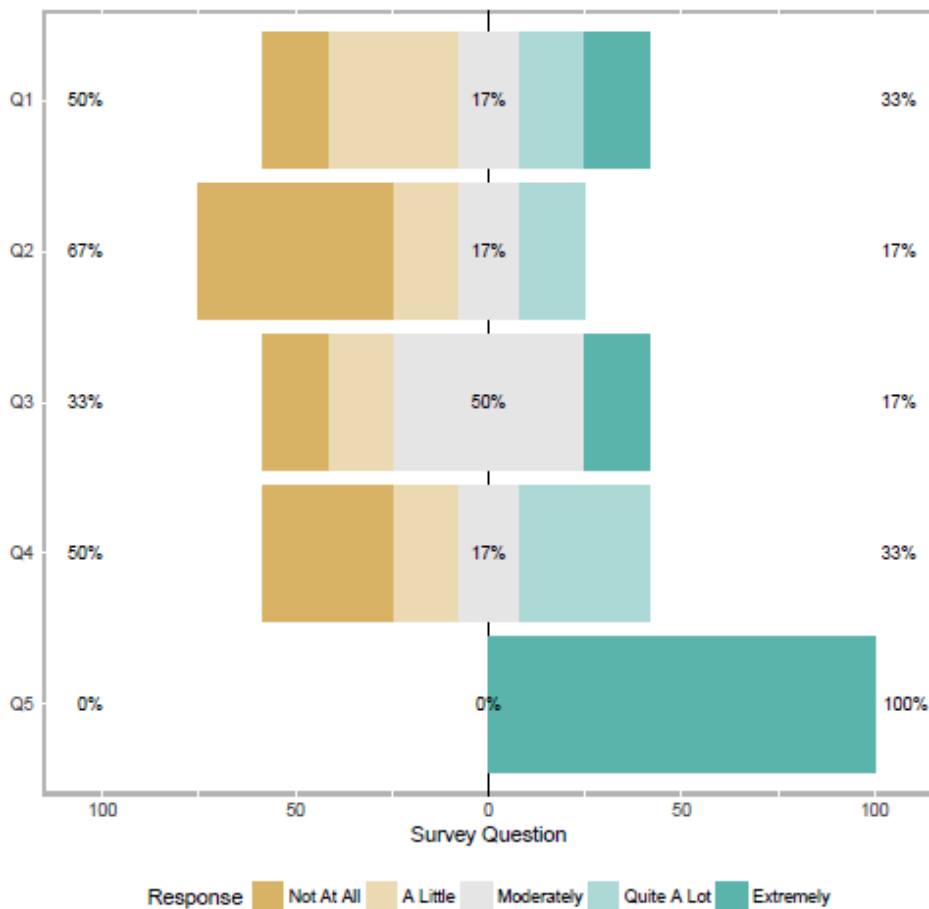


Figure 2. Female Response Percentages to Individual Survey Items



As stated above, the sample size collected during the study was limited. Therefore, the distribution of responses for each survey item was examined for each gender using the Fisher's exact test of independence (McDonald, 2014). While comparing the control to the intervention group, the differences were categorized into

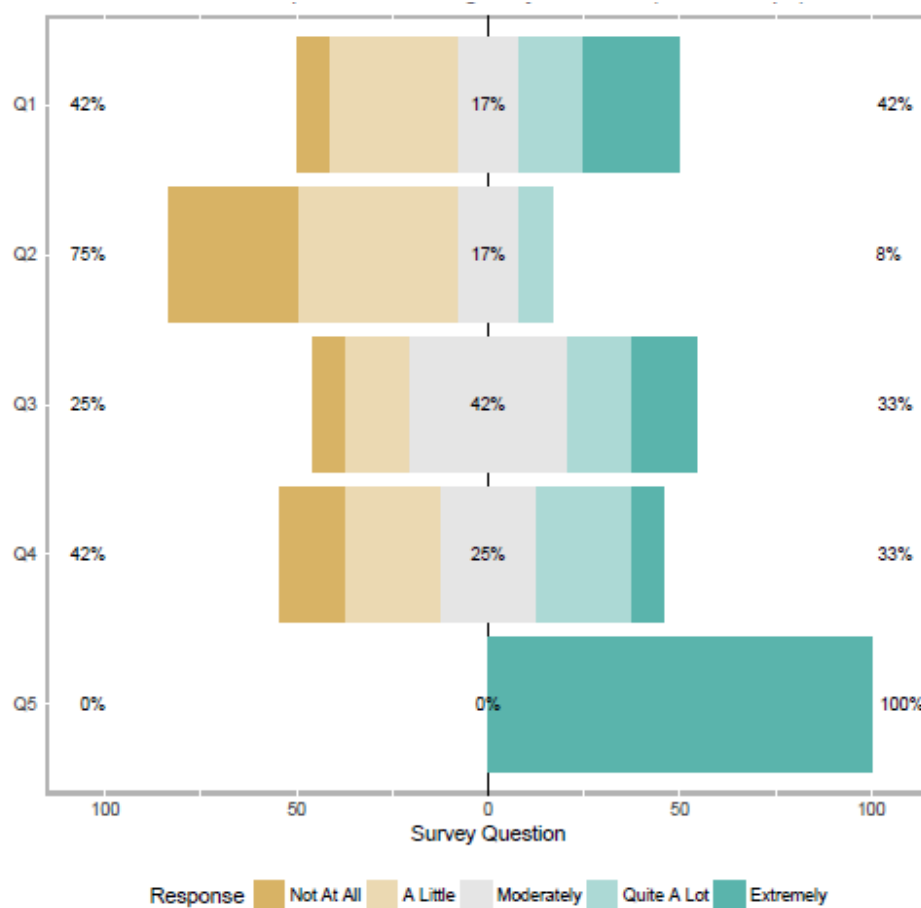
three areas: low, neutral, and high. Responses of *not at all* and *a little* were classified as low, those of *moderately* was classified as neutral, and those of *quite a lot* and *extremely* were classified as high.

Parents completing surveys for female pediatric patients were more likely to select low responses for all questions except for the survey questions 2 and 5. In Question 1, which asked whether “*My child was stressed or anxious while receiving their injection/ IV,*” 50% of the survey responses of female patients were classified in the low category as compared to 33% of the responses by the male group in the same. For question 2, 67% of the survey responses for female patients were in the low category as compared to 82% for males. Parents selected low responses for female participants 33% and 50% of the respective times for question 3, which asked whether “*My child cried while receiving their injection/ IV*”. Question 4, which asked whether “*My child was distressed and in pain while receiving their injection/ IV,*” had parents of male children selecting 17% and 33% of low responses in the respective instances. Overall, parents of the female patients were more likely to select favorable responses irrespective of whether they were in the control or intervention group.

Figure 3 includes the individual survey item responses from individuals in the experimental and control groups (combined). The distribution for each question is individually displayed in order to indicate the percentage that each rating received. When reviewing responses to question two, “*My child was uncooperative while receiving their injection/ venipuncture,*” 75% of the parents selected either *a little* or *not at all*. Another noticeable trend in the data was that all of the 12 participants answered *extremely* in response to question five—“*Overall, how helpful were staff during your child’s*

injection/IV?". Therefore, these results suggest that parents of the pediatric patients viewed the staff to be helpful in both the control and the intervention groups.

Figure 3. Response Percentages for Individual Survey Items: Experimental and Control



Figures 4 and 5 show the response percentages per question for the intervention and control group respectively. Both figures use a box plot format to display the data.

Figure 4. Plot of intervention response percentages by questions

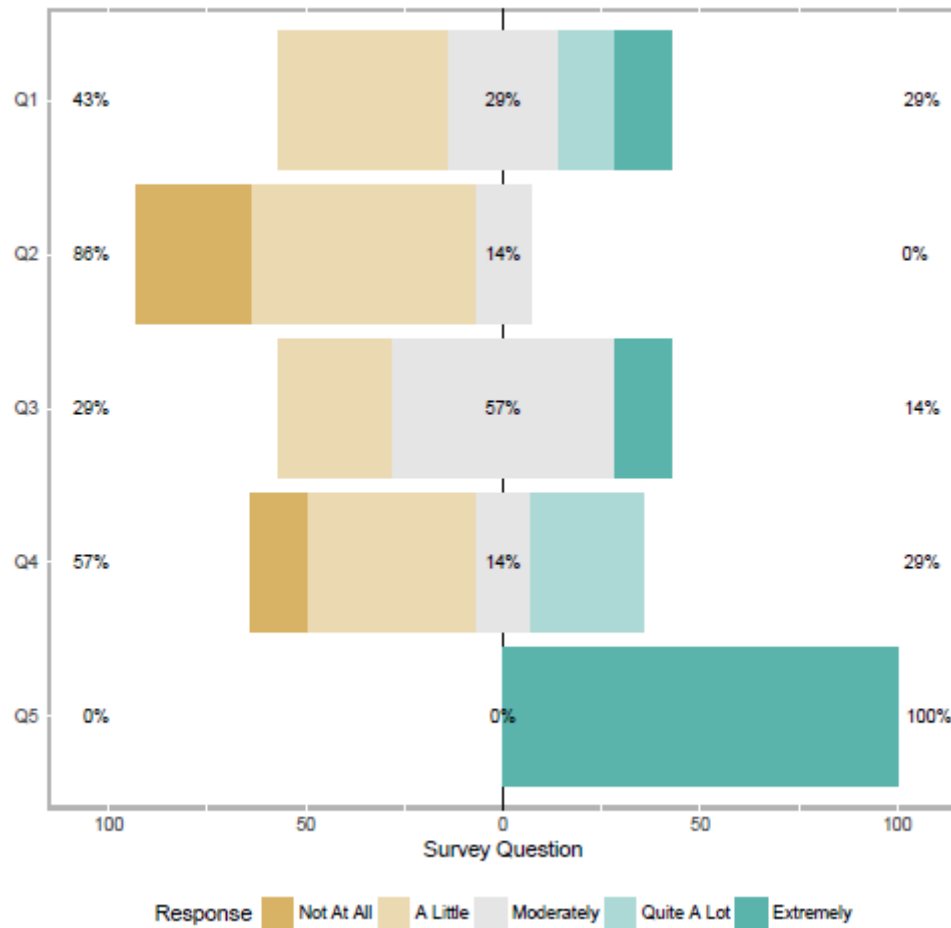
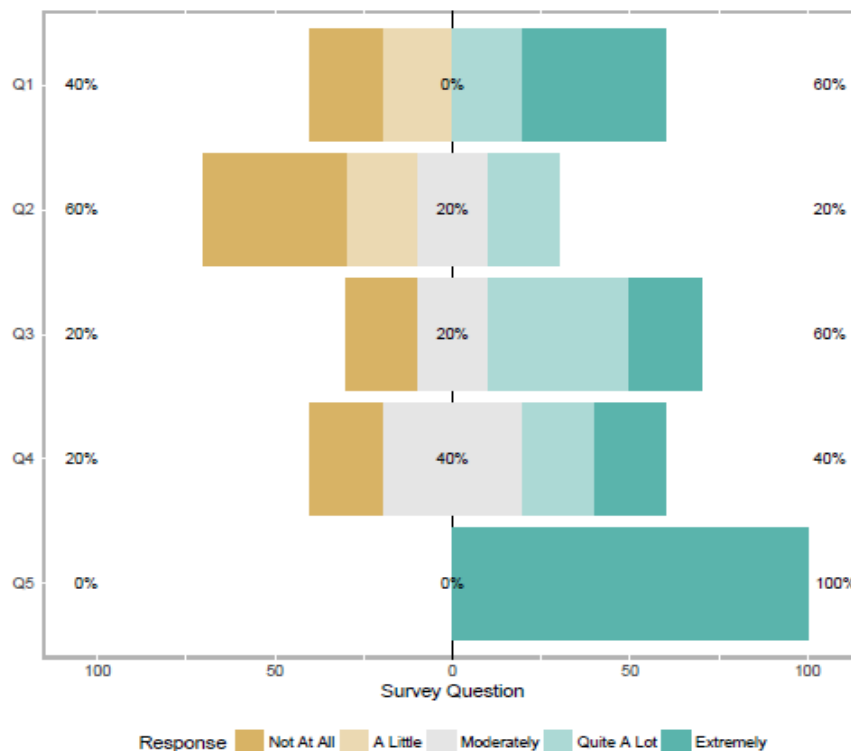


Figure 5. Plot of control response percentages by question



When comparing the control to the intervention group, the differences were categorized into three areas: low, neutral, and high. Responses of *not at all* and *a little* were classified as low responses. The response of *moderately* was classified as neutral. The responses of *quite a lot* and *extremely* were classified as high responses.

When considering question one, 40% of the parents in the control group and 42.86% of those in the intervention group selected a low response. Question 1 asked parents to rate how anxious their child was. Therefore, a low response was desirable. While the percentage of low responses was similar between the control and the intervention group, 60% of parents selected a high response in the control group while only 28.57% selected the same in the intervention group. Therefore, the intervention

group had a significantly smaller percentage of participants who felt that their children were *quite a lot* or *extremely* anxious while receiving their injection or venipuncture. The mean score of the control group was 3.4, while that of the intervention group was 3.

Question 2 asked parents to rate if their children were uncooperative during their injection or venipuncture; therefore, a low number was also desirable. 60% of parents in the control group selected a low response in comparison to 85.71% of parents in the intervention group. The difference between the mean scores for question two was 0.34, as the control group had a mean score of 2.2 and the intervention group had a mean score of 1.86. Thus, parents in the intervention group felt that their children were more cooperative than parents whose children were in the control group.

Question 3 asked parents to rate whether their children cried during their injection or venipuncture. 60% of the parents in the control group chose the high response. On the other hand, the parents in the intervention group chose high responses only 14.29% of the times. The mean score difference was 0.40, with the mean of the control group being 3.4 and the mean of the intervention group being 3. Although there was a small difference between the means, the percentage of parents who felt that their child cried *quite a lot* or *extremely* was much larger in the case of the parents whose children did not receive a Kindle that distracted them.

Question 4 witnessed the largest difference between the mean scores of the intervention and control groups. Question 4 asked parents to answer whether their children were distressed and/or in pain during the injection or IV. The difference in mean score was 0.63, with a mean of 3.2 for the control group and a mean of 2.57 for the intervention group. 28.57% of the parents in the intervention group answered with a high

response, whereas 40% of those in the control group selected a high response. Meanwhile, 57.14% of the parents in the intervention group selected a low response while only 20% of the parents in the control group selected a low response. As a result, parents whose children received a Kindle to use during their injection or venipuncture were a lot more more likely to say that their child only appeared to be either *a little* or *not at all* distressed, or even in pain.

All of the first four questions reflected a similar pattern, with a more desirable mean score being selected by parents in the intervention group. The difference between the means varied per question. Question 5 was the only question which displayed no difference in either means or responses. All of the 12 participants rated the staff as *extremely* helpful no matter which group their children were put in. While the difference between questions 1-4 may have not produced statistically significant results, all of the questions indicated the fact that the use of Kindle was a positive influence on a pediatric patient's experience and alleviated his/her level of discomfort during the process of injection or venipuncture. Table 1 indicates the combined mean responses for both the control and intervention groups. It also shows the percentage of responses that were classified as low, neutral, or high. Table 2 displays the mean score and percentage of responses in the low, neutral, or high classification for the control group. Table 3 shows the mean score and percentage of responses for the intervention group.

Table 1

Summary of Survey Responses by Questions: All Responses

Question	N	Mean	SD	Low %	Neutral %	High %
Q1		3.17	1.40	41.67	16.67	41.67
Q2		2.00	0.95	75.00	16.67	8.33
Q3		3.17	1.19	25.00	41.67	33.33
Q4		2.83	1.27	41.67	25.00	33.33
Q5		5.00	0.00	0.00	0.00	100.00

Table 2

Summary of Survey Responses by Questions: Control

Question	N	Mean	SD	Low %	Neutral %	High %
Q1		3.40	1.82	40.00	0.00	60.00
Q2		2.20	1.30	60.00	20.00	20.00
Q3		3.40	1.52	20.00	20.00	60.00
Q4		3.20	1.48	20.00	40.00	40.00
Q5		5.00	0.00	0.00	0.00	100.00

Table 3

Summary of Survey Responses by Questions: Intervention

Question	N	Mean	SD	Low %	Neutral %	High %
Q1	7	3.00	1.15	42.86	28.57	28.57
Q2	7	1.86	0.69	85.71	14.29	0.00
Q3	7	3.00	1.00	28.57	57.14	14.29
Q4	7	2.57	1.13	57.14	14.29	28.57
Q5	7	5.00	0.00	0.00	0.00	100.00

Tables 5 and 6, as shown below, display the data collected for the control and response groups respectively. Question 1 inquired about the stress and anxiety levels of the patient. In the control group, 20% of the participants selected *not at all* whereas no participants in the intervention group felt that their child did not display anxiety or stress. In the control group, 20% selected *a little* in comparison to 42.9% in the intervention

group. No participants in the control group selected *moderately* whereas 28.6% of participants in the intervention group selected *moderately*. In the control group, 20% and 40% of participants choose *quite a lot* and *extremely*, respectively. In contrast, the intervention groups had less participants who chose these undesirable selections—14.3% for both groups. Therefore, even though all of the participants in the intervention group felt that their children experienced some level of anxiety, its intensity appeared to be less.

Question 2 assessed how uncooperative patients appeared to be while receiving an injection or a venipuncture. 40% of the participants in the control group selected *not at all* whereas 28.6% of the participants in the intervention group chose *not at all*. 20% of the participants in the control group choose *a little* in comparison to 57.1% of the intervention group participants. In the control group, 20% of the participants choose *moderately* in comparison to 14.3% in the intervention group. *Quite a lot* was chosen 20% of the times by the control group, and *extremely* was chosen in 40% of the cases. Similar to the results in Question 1, the intervention group had less responses in these categories with no participants choosing either *quite a lot* or *extremely*.

Question 3 asked whether the respective children cried during the injection or venipuncture. 20% of the control group selected *not at all*, with no responses of *not at all* from the intervention group. None of the parents in the control group selected *a little*, whereas 28.6% of those in the intervention group did. Only 20% of the control group chose *moderately* as compared to 57.1% of the intervention group. 40% of the control group selected *quite a lot* in contrast with no selections in the intervention group. Finally, 20% of the control group and 14.3% of the intervention group chose *extremely* as

a response. The responses in question 3 supported the trend of increased moderate to lower responses from the intervention group.

Question 4 asked about the level of distress and pain that the children appeared to be in while receiving their injection or venipuncture. 20% of the control group chose *not at all* in comparison to 14.3% of those in the intervention group. No parents in the control group selected *a little* whereas 42.9% of those in the intervention group did. Moreover, 40% of the control group selected *moderately* while only 14.3% of parents in the intervention group chose the same. 20% of the participants in the control group chose *quite a lot* and *extremely* while 28.6% and 0% of participants, respectively, selected the same in the intervention group. It is interesting to note that more participants in the control group selected *not at all*, which was the most desirable response for questions 1-4, in all of these four questions. In contrast, more participants in the control group selected *extremely*, which was the least desirable response, for the first four questions. This observation supports the idea that while children using the Kindle during an injection or venipuncture still have some pain and anxiety, the severity level is lower when an electronic tablet is used for distraction.

Question 5 inquired about the staff's helpfulness. This question differed from the rest because *extremely* was the most desired response. All of the parents in both the control and intervention groups selected *extremely* as their response. Therefore, the parents belonging to both the control and intervention group found the staff at the rural midwestern ED to be helpful. Tables 4, 5, and 6 display the percentage of each response that was selected by parents who completed the survey. Table 4 presents the percentages

for both the control group and intervention group combined, whereas Table 5 contains the responses of the control group. Table 6 contains the intervention group's responses.

Table 4

Percentages of All Responses: Both Groups

Question	Not At All	A Little	Moderately	Quite A Lot	Extremely
Q1	8.3	33.3	16.7	16.7	25
Q2	33.3	41.7	16.7	8.3	0
Q3	8.3	16.7	41.7	16.7	16.7
Q4	16.7	25	25	25	8.3
Q5	0	0	0	0	100

Table 5

Percentages of All Responses: Control Group

Question	Not At All	A Little	Moderately	Quite A Lot	Extremely
Q1	20	20	0	20	40
Q2	40	20	20	20	0
Q3	20	0	20	40	20
Q4	20	0	40	20	20
Q5	0	0	0	0	100

Table 6

Percentages of All Responses: Intervention Group

Question	Not At All	A Little	Moderately	Quite A Lot	Extremely
Q1	0	42.9	28.6	14.3	14.3
Q2	28.6	57.1	14.3	0	0
Q3	0	28.6	57.1	0	14.3
Q4	14.3	42.9	14.3	28.6	0
Q5	0	0	0	0	100

Below, the p -values that were calculated using the Fisher's exact test can be seen in Table 7. Question 3 was the closest to being statistically significant, with a p -value of 0.25. Question 1 had a p -value of 0.6, Question 2 had a p -value of 0.66, and Question 4

had a p -value of 0.49. Since every response was the same for Question 5, a p -value could not be calculated (McDonald, 2014). Please refer to table 7 to see the p -values which were calculated by using the Fisher's exact test.

Table 7

Fisher's Exact Test p-values

Question	p-value
Q1	0.6
Q2	0.66
Q3	0.25
Q4	0.49
Q5	N/A

Open-Ended Survey Comments

Along with the quantitative data that was collected throughout the study, open-ended survey comments were also collected and reviewed. The comment portion of the research survey was located on the back of the second page. This section gave parents the opportunity to openly express how they felt about their respective children's experiences.

Out of the five surveys that were collected from the parents belonging to the control group, four left comments. These included the following: "The injection was much needed. She was able to relax and felt better afterward;" also, "He did get seven pokes today, so he was probably more distressed then normal." The other comments from the control group said the following: "Just want to say thank you. I know my kid is very easy going but you guys made her feel even more comfortable;" and "The bear the nurse gave her made her very happy afterwards! Everyone was so helpful." The

comments in this section were very positive and indicated that the families found the staff to be helpful.

Out of the seven surveys collected from the parents belonging to the intervention group, only one left a comment. It stated that “He was very nervous at the moment of the injection, but immediately after was distracted and focused on the cartoon they put on for him.” This comment is positive as it directly referred to the intervention and spoke about how the parent felt that her child was distracted by the cartoon on the Kindle. Similar to that of the quantitative review, the open-ended survey data, especially from the intervention group, were limited. An increase in the qualitative data in future studies could further corroborate the evidence that was amassed from the survey questions while reviewing the effectiveness of electronic devices as a distraction during the administration of injections or venipunctures.

Discussion

The purpose of this DNP scholarly project (pilot study) was to evaluate whether an intervention, using electronic devices, decreased parental perceptions of their children’s pain while receiving injections or venipunctures. While other studies that used similar methods were able to obtain statistical significance, this scholarly project did not (Shahid et al., 2015; Yoo et al., 2011). However, this study provides adequate anecdotal evidence for further research on the subject of distraction as a method of pain-alleviation among pediatric patients.

The mean scores and percentages showed that the intervention group tended to select more desirable responses than the control group. A review of current literature on the topic revealed several incidences where a distraction method was found to be not only

effective but also statistically significant (Bagnasco et al., 2012; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011). Distraction methods in current literature, which appeared to be effective, included playing a video, watching an animation, and playing with electronic tablets (Bagnasco et al., 2012; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011). Distraction methods have been shown to contain little to no risk when they are implemented (Kleiber & Harper, 1999). As was noted by the current literature and the anecdotal evidence from this pilot study, distraction methods were found to help pediatric patients experience less pain and anxiety as well as lower the level of pain or anxiety that a parent perceived within his/her child (Bagnasco et al., 2012; Burns-Nader et al., 2017; Shahid et al., 2015; Yoo et al., 2011).

Strengths and Limitations

The strengths of this project included the use of a randomized controlled trial design. The use of a convenience sample comprises a non-probability sampling method (Elfil & Negida, 2017). Randomization of the control and intervention groups also amounted to a significant strength, as it is considered one of the best and crucial methods that can be utilized for research purposes (Elfil & Negida, 2017). Moreover, this study adds depth to the body of nursing knowledge which relates to distraction as a method to alleviate pain and anxiety.

The limitations of this study included the small size of the sample, the short duration of data collection, the limited availability of staff, the use of a modified theoretical framework, and the use of a survey that was not proven to be either reliable or valid. The use of a convenience sample limited the researcher's ability to recruit subjects, and the sample was not randomly sampled from the general population (Elfil &

Negida, 2017). Because of the limited sample size, the study lacked enough power which limited its ability to obtain statistical significance. A non-parametric Fisher's exact test of independence was used—this is weaker than a parametric test. The time frame allotted for completion of the study was only four months, which limited its ability to procure a larger sample size. The use of Good's (1998) theory of acute pain management was a limitation because its framework is designed for research which involves adults. Future studies should extend the time period in order to allow the collection of more data. Another drawback was the limited availability of the staff and researchers required to recruit participants, collect data, and implement the intervention.

Implications for Practice

The inferences derived from this scholarly project did not provide adequate statistically significant evidence to support the use of electronic tablets as a distraction method which reduced parental perceptions of pain and anxiety in pediatric patients. Other researchers have found distraction methods, including electronic tablets, to be effective and have achieved statistical significance with respect to their instrumentality in reducing pain and anxiety (Burns-Nader et al., 2017; Messeri et al., 2010; Shahid et al., 2015; Yoo et al., 2011). To summarize, the small sample size in this project limited the power of study, which, in turn, limited its ability to obtain statistical significance. Considering that the pediatric population has an increased risk of experiencing the anxiety and pain that is related to medical procedures, it is pertinent to explore all of the available avenues regarding alleviation (Byczkowski et al., 2013; Caprilli et al., 2007). The immediate relief that is provided by using a tablet to distract children is crucial, as procedures may need to be completed before analgesic medications or pain blocking

creams can take effect. The timeliness of analgesic relief was found to be an important factor in deciding whether parents were satisfied with the care that their children received (Byczkowset al., 2013; Forstater et al., 2012). The anecdotal evidence in this study, combined with the low cost and the absence of risk factors with regard to electronic tablets, may indicate providers to implement electronic tablets as a veritable distraction method for pediatric patients who receive injections or venipunctures.

Recommendations for Future Research

Future researchers are encouraged to conduct this study by using larger sample sizes and a longer time period for data collection. Similar studies, which utilized larger samples and longer time frames for data collection, were able to obtain statistical significance (Shahid et al., 2015). Also, several studies have collected data from the control group and intervention group during different time frames and have found statistical significance with regard to the use of electronic tablets as a distraction method (Shahid et al., 2015; Yoo et al., 2011). If the data of both the control and intervention group are being simultaneously collected, then there is a risk of jealousy that might develop in the group which is not playing with the tablet—this could skew the data. Since all of the parents from both the intervention and control group rated the staff as helpful, future studies may wish to focus on how the helpfulness of the staff can influence the patients' satisfaction.

Emergency departments are a challenging area within which one collects data and conducts a study. For this reason, it may be prudent for researchers to utilize a hospital which contains a research department to implement the study. Asking the staff in the emergency department to collect data is challenging and as a result, it becomes difficult

to recruit study participants. Instead, employment of a specialized staff may allow for more efficient research to be conducted and engender an increase in the sample size.

Conclusion

The purpose of this DNP scholarly project (pilot study) was to evaluate whether an intervention, by using electronic tablets, decreased parental perceptions of their children's pain while receiving injections or venipunctures. The data that was collected during the study lacked statistical significance. However, through a review of the distribution of survey item responses in the control and the intervention groups, certain trends could be noted. Participants in the experimental group were more likely to select desirable ratings with regard to pain or distress on the surveys. While the project failed to demonstrate that parental perceptions of pain in their children decreased as a response to the use of Kindle, anecdotal evidence supports future research that might further examine the effectiveness of using electronic tablets as devices for distraction.

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Appendix A

Memorandum**TO:** Andrew Gearhart

School of Nursing

CC: Anne Stein

School of Nursing

DATE: July 17, 2017**FROM:** Robert Winn, Ph.D.

Interim Dean of Arts and Sciences/IRB Administrator

SUBJECT: **IRB Proposal HS17-871****IRB Approval Dates: 7/17/2017 – 7/17/2018**

Proposed Project Dates: 8/1/2017 – 11/30/2017

“Improving Patient Satisfaction: Using A Kindle Among Pediatric Patients”

The Institutional Review Board (IRB) has reviewed your proposal and has given it final approval. To maintain permission from the Federal government to use human subjects in research, certain reporting processes are required.

A. You must include the statement “Approved by IRB: Project # HS17-871” on all research materials you distribute, as well as on any correspondence concerning this project.

B. If a subject suffers an injury during research, or if there is an incident of non-compliance with IRB policies and procedures, you must take immediate action to assist the subject and notify the IRB chair (dereande@nmu.edu) and NMU's IRB administrator (rwinn@nmu.edu) within 48 hours. Additionally, you must complete an Unanticipated Problem or Adverse Event Form for Research Involving Human Subjects

C. Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant

D. If you find that modifications of methods or procedures are necessary, you must submit a Project Modification Form for Research Involving Human Subjects before collecting data.

E. If you complete your project within 12 months from the date of your approval notification, you must submit a Project Completion Form for Research Involving Human Subjects. If you do not complete your project within 12 months from the date of your approval notification, you must submit a Project Renewal Form for Research Involving Human Subjects. You may apply for a one-year project renewal up to four times.

NOTE: Failure to submit a Project Completion Form or Project Renewal Form within 12 months from the date of your approval notification will result in a suspension of Human Subjects Research privileges for all investigators listed on the application until the form is submitted and approved.

Appendix B

To Whom It May Concern,

We are inviting you to participate in a research study. The purpose of the study is to evaluate techniques that decrease perceived stress in pediatric patients while they are in a healthcare setting.

We are inviting you to be in this study because your child is being cared for at [REDACTED] [REDACTED] Convenient Care Clinic or Emergency Department. The questionnaires will be distributed to any parent or guardian of a pediatric patient ages 2-6 receiving an IV or injection during the months of _____ to _____.

If you agree to participate, we would like you to complete a brief survey about the stress or pain level you felt your child was in during their visit to [REDACTED]. Your child may receive a distraction intervention intended to reduce their anxiety about being in an unfamiliar environment and receiving medical treatment. If you do not wish to have your child or yourself participate in the study simply do not complete the attached survey. The quality of care for your child will in no way be affected by whether you wish to participate in the study. If you do wish to participate but don't want to answer certain questions, feel free to submit partially completed surveys. If you and your child do wish to participate in the study, surveys will be collected before discharge from your designated healthcare setting.

We will keep the information you provide confidential; however, federal regulatory agencies and the Northern Michigan University Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. There will be no identifiable numbering system on the surveys. If we write a report about this study, we will do so in such a way that you cannot be identified.

There are no known risks from being in this study, and you will not benefit personally. However, we hope that others may benefit in the future from what we learn as a result of this study.

You will not have any change of care for being in this research study.

You will not be paid for being in the research study.

Taking part in this research study is completely voluntary. If you decide not to be in this study or if you stop participating at any time, you will not be penalized or lose any benefits for which you otherwise qualify.

If you have any further questions regarding your rights as a participant in a research project, you may contact Dr. Robert Winn of the Human Subjects Research Review Committee of Northern Michigan University at (906-227-2300) rwinn@nmu.edu. Any questions you have regarding the nature of this research project will be answered by the principle researcher who can be contacted as follows: Andrew J. Gearhart (906-776-5555) agearhar@nmu.edu.

I have read the above "Informed Consent Statement." The nature, risks, demands, and benefits of the project have been explained to me. I understand that I may ask questions and that I am free to withdraw from the project at any time without incurring ill will or negative consequences. I also understand that this informed consent document will be kept separate from the data collected in this project to maintain anonymity (confidentiality). Access to this document is restricted to the principal investigators.

Parent/Guardian Signature

Date

Thank you very much for your consideration. Returning of completed survey and signed consent is considered agreement to participate in the research study.

Sincerely,

Andrew J. Gearhart, BSN RN

Doctor of Nursing Practice Student

Approved by IRB: Project # HS17-871

Appendix C

Research Survey

Was a distraction technique used when your child received an injection or IV today?

YES

NO

Pediatric Clinic – Pain Survey

Child's age: _____

Circle child's gender: M F

Circle child's race: White Black Hispanic Asian Other

Number of injections or IVs received today: _____

Please rate the following statements regarding your child's response during their care.

1. My child was stressed or anxious while receiving their injection/IV

Not at all	A little	Moderately	Quite a lot	Extremely
1	2	3	4	5

2. My child was *uncooperative* while receiving their injection/IV

Not at all	A little	Moderately	Quite a lot	Extremely
1	2	3	4	5

3. My child cried while receiving their injection/IV

Not at all	A little	Moderately	Quite a lot	Extremely
1	2	3	4	5

4. My child was distressed and in pain while receiving their injection/IV

Not at all	A little	Moderately	Quite a lot	Extremely
1	2	3	4	5

5. Overall, how helpful were staff during your child’s injection/IV

Not at all	A little	Moderately	Quite a lot	Extremely
1	2	3	4	5

Feel free to leave any additional comments pertaining to the care your child received or the distraction technique utilized.

Approved by IRB: Project # HS17-871

Appendix D

Research Survey

We are conducting a research study for children between 2 to 6 years of age regarding pain control in the outpatient pediatric clinic here at Loyola. We would like to include your experience in our research project. We want to study how effectively we reduce pain in children receiving their shots while using various distraction techniques. Be assured that your answers will remain completely confidential. To keep your information confidential, you will be assigned a subject number ID that is unrelated to your name or other identifying information. Also, your willingness or refusal to participate will in no way affect the care you or your child receives at Loyola. The survey will only take a few minutes to complete. By completing the survey on the back of this page you are giving us permission to include your answers in our study. Thank you for your participation.

Was a distraction technique used while your child received shots today?

YES

NO

If yes, check which technique was used?

___ My child ***played with a toy*** during the shots

___ My child looked at or was ***reading a kid's book*** during the shots

___ My child ***blew bubbles or blew on a pinwheel*** during the shots

___ My child played their ***handheld video games*** during the shots

___ My child used or played with an ***iPad application*** during the

shots

(OVER)

Pediatric Clinic – Pain Survey

Circle your child's age: 2 yrs 3 yrs 4 yrs 5 yrs
 M F

Circle child's gender:

Circle child's race: White Black Hispanic Asian Other

Number of shots received today: _____

Circle location of shot(s): arm or leg

Place rate the following statements regarding your child's response during their immunizations/shots today.

6. My child was fearful or anxious while receiving their shots

Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4	5	

7. My child was *uncooperative* while receiving their shots

Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4	5	

8. My child needed to be held down while receiving their shots

Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4	5	

9. My child cried while receiving their shots

Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4	5	

10. My child was distressed and in pain while receiving shots


Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4		5


11. Overall, how satisfied were you regarding your child's pain control during their shots

Not at all	A little	Moderately	Quite a lot	Extremely	
1	2	3	4		5


Appendix E


Subject RE: [External] I pads for Distraction Study

From RAMZAN SHAHID 

To Drew Gearhart 

Date 2017-02-07 07:28

 Parent Pain Survey 2012-Final.docx (~17 KB) ▾

 This is a draft message. [Edit](#)

Hello Andrew,

I would be happy to share my survey with you. Feel free to use or modify however you need. I am happy to hear others are doing similar studies to help understand how to reduce pain and anxiety in children being treating in the hospital. Please let me know if you have any questions. My direct number at Loyola is 708-327-9125.

Thanks,
Ramzan

Ramzan Shahid M.D.
Pediatric Residency Director
Associate Professor of Pediatrics
Loyola Univ. Medical Center

Appendix F

April 4, 2017

To whom it may concern,

It is the determination of [REDACTED] Quality Management/Risk Management staff and the CNO that the research project proposed by Andrew J. Gearhart, RN may proceed at the proposed time determined by the program requirements. The proposed research project which focuses on distraction techniques to minimize anxiety and pain in the Emergency Department and Convenient Care Clinic pediatric population poses no risk to patients, staff, or the hospital.

The goal of the research project is to alleviate anxiety and promote a better pediatric patient experience. These goals are in keeping with [REDACTED] System's mission statement and objectives as a healthcare facility. Andrew J. Gearhart, RN will act independently as the researcher managing the project. Andrew will be allowed to collect data and utilize pediatric patients being cared for in the Emergency Department and Convenient Care Clinic as voluntary participants in his research project.

Andrew is allowed to begin research at his earliest convenience.

Sincerely,



Susan Hadley, BSN, MS, CEN, CCRN-K
1721 South Stephenson
Iron Mountain MI 49801
906-776-5596
Susan.hadley@dchs.org

Sincerely,



Mark Rossato,
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906-776-5471
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John Schon
Administrator/CEO

1721 S. Stephenson
Iron Mountain
Michigan
49801

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Quality and Compassion ... Improving Lives.

Appendix G

NURSING PRACTICE GUIDELINES			
Department ED	Section Number 30	Policy Number 005	Page 1 of 5
Title TRIAGE, PEDIATRIC			
Original date 12/94	Revision date 1/98, 1/01, 11/03, 11/06, 1/07, 1/09, 5/12, 11/14, 11/17		
	Revision date		
Approving Authority – Director of Emergency Services:			
Approving Authority – Chief Nursing Officer: <i>Susan Hadley</i>			

PURPOSE: The goal of pediatric triage is to rapidly assess the pediatric patient and assign a care priority. Due to the potential for rapid deterioration in the pediatric patient, accurate triage is critical. Consideration of the child's age, developmental level, and disease state are integral components of pediatric triage.

STANDARD: Standards of Care

PERSONNEL: RN

POLICY:

The four components of pediatric triage include:

1. General:

- A. The general assessment occurs as soon as the child enters the emergency department and includes:
- General appearance - Does the child look well or look ill?
 - Airway status - What is the position of mouth to facilitate air entry? Are there audible airway sounds such as stridor, grunting, or wheezing? Is the child coughing? If so, is it a barking cough?
 - Breathing status - Is the child's breathing rapid, labored, or shallow?
 - Circulatory status - Is the child's skin color pale, dusky, cyanotic, mottled, or flushed? Is there any obvious bleeding? Is the child diaphoretic?
 - Disability (neurologic status) - Is the child running, walking, requiring assistance to ambulate, or being held? Is the child alert, irritable, or sleepy?

Depending on the observational assessment of the child's general appearance, the child may either be brought directly into the emergency department or to the triage area.

2. Physical assessment:

The extent of the triage physical assessment depends upon the child's condition, and time constraints due to patient volume. The physical assessment completed in triage is a rapid process. If the child does not have a patent airway, adequate breathing or perfusion, the remainder of the triage assessment is interrupted and appropriate interventions are initiated.

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The following table mnemonic is used for nursing assessment and intervention with the pediatric patient:

Approach to Pediatric Assessment

ASSESSMENT	INTERVENTION
A - Airway - patency, positioning for air entry, audible sounds, airway obstruction (blood, mucous, edema)	A - allow the child to maintain a position of comfort or position the airway (jaw-thrust or sniffing); use airway adjuncts as required
B - Breathing - increased or decreased work of breathing; nasal flaring; use of accessory muscles of respiration; pattern; quality	B - provide supplemental oxygen; initiate assisted ventilation with bag-valve-mask and intubate as indicated; provide gastric decompression by use of a nasogastric or orogastric tube
C - Circulation - color of skin and capillary refill; strength of peripheral and central pulses; skin temperature	C - obtain vascular access; initiate volume replacement; perform chest compressions; defibrillate or provide synchrony; initiate drug therapy
D - Disability - activity level, level of consciousness; response to the environment; muscle tone; pupillary response	D - treat the underlying cause (e.g., signs of increased intracranial pressure, fluid or blood volume deficit, hypoxia)
E - Expose - to identify underlying injuries or additional signs of illness	E - remove all clothing, including diapers
F - Frigid - keep the child warm	F - maintain normothermic environment; initiate supplemental warming measures
G - Get vital signs - evaluate the child's vital signs including temperature	G - continuously monitor the child's vital signs, including temperature; weigh child, obtain estimated weight if child's condition prohibits measured weight

To be completed in patient room upon arrival:

H - Head-to-toe assessment - perform a complete head-to-toe assessment and obtain a history; during triage assessment the head to toe/secondary assessment may need to be focused on the chief complaint	H - continuously monitor the child for changes in condition; assess for any unusual odors
I - Inspect the back and isolate - observe the back for obvious or hidden injuries; assess for communicable illness or susceptibility to illness (immunocompromised patients)	I - reassess the back as indicated; provide isolation as indicated

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3. **Triage history** - The pediatric history can be completed by utilizing the following mnemonic: **CIAMPEDS** (see attached table)

(C) Chief Complaint	Why was the child brought to the emergency department? What is the primary problem/concern and duration?
(I) Immunizations	Are they up to date? When were they last given?
Isolation	Has the child recently been exposed to any communicable diseases?
(A) Allergies	Does the child have any known allergies? Is the child allergic to any medications? What was the child's reaction to the medication?
(M) Medications	Is the child taking any prescription drugs or over-the-counter drugs (e.g., acetaminophen)? When was the last dose administered and how much was given? Is the child on immunosuppressive medications?
(P) Past Medical History	Does the child have a history of any significant illness, injury, or hospitalization? Does the child have a known chronic illness?
Parents/caregivers Impression of Child's Condition	What is different about the child's condition that concerns the parent/caregiver?
(E) Events Surrounding the Illness or Injury	How long has the child been ill? Was the onset rapid or slow? Has anyone else in the family been ill? If the emergency department visit is for any injury, when did the injury occur, was it witnessed, and what happened?
(D) Diet	How much has the child been eating and drinking? When was the last time the child ate or drank?
Diapers	When was the child's last void? How much was it? When was the child's last bowel movement? What did it look like and how large was the stool?
(S) Symptoms Associated with the Illness or Injury	What other symptoms are present? When did the symptoms begin? Has the condition gotten better or worse?

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4. **Triage decision:**
All patients will be assigned a triage category based on triage condition and assessment

Triage Categories:

- 1-EMERGENT - True emergency which threatens life, limb or sight. Should be brought to the treatment area immediately and physician notified.
 2-URGENT - The serious or potentially serious patient.
 3-NON-URGENT - Primary care patients. Disorder is minor or non-acute.

Examples of patients in each classification

1. **ESI LEVEL 1 EMERGENT, Immediate Life Saving** - Requires immediate medical attention. Condition is acute and potentially threatens life or function.
 - A. Severe respiratory distress
 - B. Hypovolemia/shock
 - C. Purpuric rash with signs of meningitis
 - D. Fever and petechiae
 - E. Ingestion/overdose (Call emergency physician for initial management)
 - F. Lacerations with neurovascular compromise
 - G. Orthopedic injuries with neurovascular compromise
 - H. Open fractures
 - I. Penetrating trauma
 - J. Violent patients
 - K. Severe testicular pain (possible testicular torsion)
 - L. Unconsciousness
 - M. Active seizure
 - N. Penetrating eye injuries, hyphemas, chemical exposures
 - O. Any significantly ill-appearing child
 - P. When mechanism of injury suggests serious injury (fall from height, auto-pedestrian/ bicycle accident).

2. **ESI LEVEL 2- URGENT, High Risk** - Requires medical attention within few hours. Condition is acute but not necessary life or function threatening.
 - A. Mild to moderate respiratory distress - (judged by air movement, SAO₂ 94% or less, color and respiratory comfort)
 - B. Patients with auditory/auscultatory wheezes (who are in no distress)
 - C. Altered level of consciousness
 - D. Significant abdominal pain
 - E. Sexual assault or abuse within 48 hours
 - F. Dental injuries
 - G. Seizures (not active)
 - H. Head trauma with vomiting but without altered level of consciousness
 - I. Emotional distress with threat to self or others
 - J. Dehydration (moderate)
 - K. Sickle cell patients with fever and/or pain crisis
 - L. Immunosuppressed patients
 - M. Infants < 2 months of age with history of temperature > 38° C (higher risk for meningitis)
 - N. Suicidal ideation
 - O. Periorbital cellulitis or facial cellulitis, high fever (increased risk for meningitis)
 Tooth avulsion where delay could affect future growth.
 - a. Dental injuries with avulsed permanent tooth (patient has tooth).

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3. NON-URGENT

Level 3

- 2 or more resources

Level 4

- 1 resources

Level 5

- 0 resources

- A. Alert child with fever and simple complaints such as ear pain, sore throat or nasal congestion.
- B. Patients with vomiting and diarrhea with mild dehydration.
- C. Sprains and strains.
- D. Superficial scratches or bruises.

Only non urgent patients should be sent to waiting room following triage.