

A CHILD LIFE PERSPECTIVE: THE ROLE OF TECHNOLOGY IN
PREOPERATIVE PREPARATION AND DISTRACTION

by

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ABSTRACT

COURTNEY NORRIS OSBORNE. A Child Life Perspective: The Role of Technology in Preoperative Preparation and Distraction. (Under the direction of DR. JANEDIANE SMITH)

Reduction of stress and anxiety for hospitalized children has been studied for years. Certified child life specialists take on the role of providing interventions to support and facilitate coping for hospitalized children. Preoperative preparation and distraction interventions are two evidence-based practices used for reducing stress and anxiety of hospitalized children. Certified child life specialists are tasked with implementing new technology platforms developed with the goal of helping hospitalized children face stressful and anxiety provoking procedures and medical experiences. The purpose of this study was to investigate and describe the use and anticipated use of new technology platforms in pediatric preoperative preparation programs and distraction techniques (i.e., non-pharmacological interventions) from the perspective of the certified child life specialist. Certified child life specialists completed an electronic questionnaire and data were analyzed using descriptive statistics and thematic analysis. Analysis revealed that new technology platforms were already being using by certified child life specialists for preoperative preparation and distraction interventions. While there was an overall positive outlook, satisfaction, and efficacy associated with the use of new technology platforms for preoperative preparation and distraction, several realistic hesitations and areas for growth were associated with their use.

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LIST OF ABBREVIATIONS

ACLP	Association of Child Life Professionals
CCLS	Certified child life specialist
NTP	New technology platform
VR	Virtual reality

CHAPTER 1: INTRODUCTION

The potential for hospital procedures to cause children emotional distress is well known and widely accepted (Rasnake & Linscheid, 1989). Hospitals introduce a variety of stress and anxiety-provoking factors for children, including unfamiliar routines, environments, people, and equipment, separation from parents, misconceptions about hospital procedures, sensory stimuli such as smells and sounds, and loss of control (Callery & Smith, 2005; Panella, 2016; O'Conner-Von, 2000). The stress and anxiety pediatric patients experience as a result of minor medical procedures, outpatient surgery, and/or hospitalization manifest in a variety of ways including negative behavioral responses (e.g., nightmares, problems sleeping and eating), separation anxiety, prolonged and/or increased feelings of pain, and increased postoperative recovery time and/or analgesic consumption (Kain, Mayes, Caldwell-Andrews, Karas, & McClain, 2006; Kain, Mayes, O'Connor, & Cicchetti, 1996; Koler, 2007; Li & Lopez, 2006; O'Conner-Von, 2000; Sipowicz & Vernon, 1965). Continuous effort should be made to help children and families manage preoperative anxiety, as reduced anxiety allows children to experience more comfort and control as they enter medical procedures or surgeries and improves postoperative satisfaction and outcomes (Burns-Nader, Joe, & Pinioin, 2017; Fortier, Del Resario, Martin, & Kain, 2010; Kain et al., 2006). Study of stress and anxiety in young patients found that behavioral interventions (e.g., preoperative preparation programs, stress management, coping skills support) should be provided for all children (Capurso & Ragni, 2016; Kain, Mayes, & Caramico, 1996; O'Connor-Von, 2000).

The majority of the five million children that undergo surgery each year in the United States experience significant stress and anxiety prior to surgery (Kain, Mayes,

Caldwell-Andrews, Karas, and McClain, 2006). Kain, Mayes, and Caramico (1996) found that approximately “70% of hospitals routinely offer preoperative behavioral programs to children and their parents” (pp. 509) with the goal of reducing anxiety. Preoperative preparation programs and distraction techniques (i.e., non-pharmacological interventions) are proven to reduce anxiety for children undergoing surgery or a medical procedure (Capurso & Ragni, 2016; Kain & Caldwell-Andrews, 2005). Preoperative preparation programs aim to increase patient knowledge of and control over their upcoming procedure by providing developmentally appropriate information, supporting emotional expression, and developing trusting relationships with healthcare professionals (Koller, 2007; Vernon, Foley, Sipowicz, Schulman, 1965). Distraction techniques have been used before or during a medical procedure to engage the child in a more familiar activity in order to reduce procedure related pain and anxiety (Burns-Nader et al., 2017; Liguori et al., 2016). One important element of both of these methods is the involvement of a trusted healthcare professional who supports the child through their perioperative experience. This particular study will focus on the role of the child life specialist.

Wolfer, Gaynard, Goldberger, Laidley, and Thompson (1988) determined that pediatric patients who participated in a child life program experienced significant improvements in regards to “emotional distress and coping effectiveness during procedures, overall coping and adjustment during the hospital stay, understanding of hospitalization and procedures, and post hospital adjustment and physical recovery” (pp. 253-254). Today, there are approximately 450 child life programs in the United States (Association of Child Life Professionals, n. d.). According to O’Connor-Von (2000) and the American Academy of Pediatrics [AAP] (2014), child life programming is essential

within pediatric hospitals, and child life specialists are an integral part of the pediatric healthcare team. Child life specialists provide individualized and developmentally appropriate psychosocial care to pediatric patients in the form of medical play, psychological preparation, pain management and coping skills coaching, and family support (American Academy of Pediatrics [AAP], 2014; Boles, 2016). Child life specialists are uniquely positioned to develop trusting, supportive relationships with pediatric patients and their families, which is a critical component of successfully reducing anxiety for pediatric patients (Koller, 2007). Non-pharmacological interventions (i.e., preoperative preparation and distraction) provided by child life specialists have been proven to reduce anxiety for pediatric patients (Brewer, Gleditsch, Syblik, Tietiens, & Vacik, 2006; Burns-Nader et al., 2017).

As technological advances are made, new tools are introduced to help support children with medical experiences. Technologies such as virtual reality [VR], web-based educational programs, and tablet-based apps have been designed to provide preparation and/or distraction for medical procedures and have been successful in reducing perioperative anxiety for pediatric patients (Burns-Nader et al., 2017; Chartrand, Clendinneng, Gaboury, & Tourigny, 2011; Eijlers et al., 2017; Fortier et al., 2015; Liguori et al., 2016; Rassin, Gutman, & Silner, 2004; Wright, Raazi, & Walker, 2017). With so many options to potentially improve perioperative intervention methods, Child Life departments are faced with deciding how new technology interacts with current non-pharmacological interventions. According to AAP (2014), “it remains essential for child life services to adapt and grow with the changing health care delivery system in support of the highest possible quality of care for children and their families” (p. e1475). The

growth in new, technology-based approaches to preoperative preparation and distraction call for exploration of how child life specialists feel this growth and adaptation can take place.

1.1 Statement of Purpose

The purpose of this study was to investigate and describe the use, or anticipated use, of new technology platforms in pediatric non-pharmacological interventions, more specifically preoperative preparation programs and distraction interventions, from the perspective of the child life specialist. As technology continues to grow, child life specialists are challenged with integrating and effectively utilizing new technology platforms. Recent research provides evidence of the effectiveness of new technology applications in reducing anxiety for children undergoing medical procedures (Burns-Nader et al., 2017; Chow, Van Lieshout, Schmidt, & Buckley, 2017), however research these studies did not address child life specialists' perspective on appropriate utilization of such platforms. As the knowledge base on the development of technology for the use of preoperative preparation and distraction continues to grow, the perspective of the child life specialist is critical to understanding if, and under what circumstances, integration of these tools can enhance, complement, and/or replace child life services.

1.2 Research Questions

1. How are certified child life specialists currently using, or anticipate using, new technology platforms?
2. What are certified child life specialist's perceptions (i.e., hesitation vs. enthusiasm), beliefs, and attitudes towards new technology platforms that are being introduced as methods for preoperative preparation and distraction?

3. To what extent do certified child life specialists see new technology platforms as a complement/replacement and improvement/detriment to their current efforts to reduce perioperative anxiety via preoperative preparation and distraction interventions?
4. What are the pros and cons associated with the implementation of new technology platforms and their potential to affect the role of the certified child life specialist?

1.3 Definition of Terms

The following terms and definitions are based on a review of the literature and have been created by the researcher for the purposes of this study:

Emotional response: feelings of fear, pain, stress, and/or anxiety that a child may experience due to hospitalization (Sipowicz & Vernon, 1965; Tiedeman & Clatworthy, 1990; Vernon, Schulman, & Foley, 1966).

Anxiety: specific component of a child's emotional response to hospitalization that has potential to result in maladaptive behaviors during and following hospitalization (Kain et al., 2006; Tiedeman & Clatworthy, 1990).

Hospitalization: an experience when a child spends time in a hospital setting as the patient in order to undergo inpatient surgery, outpatient surgery, or a procedure that may or may not require anesthesia.

Perioperative anxiety: anxiety experienced prior to, during, and following hospitalization (e.g., preoperative holding area to the two weeks following surgery; Fortier et al., 2010). This term is meant to encompass literature that refers to preoperative anxiety, or anxiety experienced in the time leading up to surgery or a procedure (Capurso & Ragni, 2016)

Non-pharmacological interventions: preoperative preparation and distraction interventions. Literature uses terms such as psychological, behavioral, and psycho-educational intervention to describe preoperative preparation and distraction methods; there is not one term that is consistently used to describe the methods that are discussed in this study. For the purposes of this study, non-pharmacological intervention will be used as a term to encompass all of these terms (Burns-Nader, Joe, & Pinion, 2017; Capurso & Ragni, 2016; Kain & Caldwell-Andrews, 2005; Wright, Stewart, Finely, & Buffett-Jerrott, 2007).

New technology platforms (NTPs): technology applications intended to be used in preoperative preparation and distraction with the goal of preparing, education, and potentially reducing perioperative anxiety. These platforms include virtual reality, tablet-based applications, video games, and computer or internet-based programs (Burns-Nader et al., 2017; Chow et al., 2017; Liguori et al., 2016).

Certified child life specialist (CCLS): a healthcare professional “educated and clinically trained in the developmental impact of illness and injury” (Association of Child Life Professionals, n. d.) who works with children of all ages and their families to support positive coping and stress management in a variety of healthcare environments. Support is provided via evidence-based, developmentally appropriate psychosocial interventions and education. CCLS credentialing is issued by the Association of Child Life Professionals (ACLP) after the successful completion of a minimum of bachelors degree in child life or a related field, at least 480 hours of clinical experience under the supervision of an experienced CCLS, and the Child Life Professional Certification exam.

CHAPTER 2: REVIEW OF THE LITERATURE

To identify relevant literature on children's emotional responses to medical procedures and surgery, preoperative anxiety, child life roles in reducing patient anxiety, and uses of technology in perioperative interventions for children, the following EBSCOhost research databases were searched: PsycINFO, Child Development and Adolescent Studies, Academic Search Complete, Education Research Complete, ERIC, Health Source-Consumer Edition, Health Source: Nursing/Academic Edition, and CINAHL Plus with Full Text. The National Center for Biotechnology Information (NCBI) PubMed database was also searched. The terms *education, preparation, intervention, anxiety, preoperative anxiety, anxiety reduction, children, pediatric, pediatric anxiety, preoperative preparation, surgery preparation, virtual preparation, virtual reality, distraction, technology, and child life specialist* were used in electronic search. In addition, ancestral searches of journal articles and the Association of Child Life Professionals community resource files were explored in order to locate further resources for the literature review.

2.1 Theoretical Background

Cognitive processes are an essential component in an individual's perception and understanding of the hospital. It is especially important to understand child development and the way in which children learn and process information in order to implement non-pharmacological interventions that are effective in educating children and reducing anxiety. In addition to this, one must take into account a child's ability to cope in frightening and stressful situations, their psychosocial needs, and the role of therapeutic relationships in assessing and meeting these needs.

Piaget's Cognitive Development Theory

Central to much of the literature on preparing children for surgery and medical procedures, as well as effective child life practice, is the idea of preparing children based on their developmental level. Piaget's stage theory of cognitive development informs this practice. This theory emphasizes the cognitive capacities of children based on their chronological age. Age determines which preset cognitive stage a child is in and suggests there is a developmentally appropriate way to educate a child based on their current stage (Capurso & Ragni, 2016; Rasnake & Linscheid, 1989). A child's developmental stage is thought to correlate with different factors or predictors of anxiety. For example, for a child in the preoperational stage, magical thinking or the inability to distinguish fantasy from reality (i.e., understanding the true cause of hospitalization) would be anxiety-provoking. A child in the concrete operation stage, however, may be able to think logically about hospitalization (i.e., understand the step by step process) but be concerned about the details of the experience (Brewer, Gleditsch, Syblik, Tietiens, & Vacik, 2006). Eiser & Patterson (1984) found that children undergo developmental shifts (i.e., are influenced by their environment and experiences) in the knowledge they possess and find important; therefore, "the type of information given to children should be sensitive to individual needs and interests. Chronological age is an important variable in this respect" (p. 50).

Information Processing Theory

Information processing theory, which also serves as a cornerstone of these interventions, asserts that children develop "scripts" based on their experiences. Piaget's stage theory proposes that cognitive development happens in a defined sequence as a

result of maturation and structural growth. A criticism of this approach is the lack of attention given to the effect experience has on knowledge and cognitive development (i.e., the role of socialization and environmental factors such as familial influences, television, and past experiences). Based on information processing theory, what children gain from their environment is integrated into what they know about illness and hospitalization; the result of this knowledge is a “script” of how the child imagines or perceives an event (Callery & Smith, 2005). From this perspective, learning what a child knows about hospitalization (i.e., determining their scripts) plays an important role in administering effective preoperative preparation and distraction interventions. Thus, interacting with children to learn about their expectations, worries, and misconceptions about hospitalization allows child life specialists the opportunity

to establish their information needs or their 'script' for a hospital visit. Information regarding how children view admission to hospital could enable the preparation of children with altered 'script' of what they will encounter, enabling them to practice this script prior to admission so as to allay misconceptions and anxieties. (Callery & Smith, 2005, p.236)

Rather than focusing on what children do not know, learning what children do know, what their expectations are, and what misconceptions they may have about hospitalization allows for effective preparation and rehearsal of scripts that include accurate, age appropriate details (Eiser, 1989); this process closes the potential gap between the child’s experience and the child’s expectations of the experience (Turner, 2009).

Social Learning Theory

Piaget's stage theory and information processing theory are considered informational approaches to learning while social learning theory is considered a behavioral approach learning (Turner, 2009; Goldberger, Mohl, & Thompson, 2009); there is a place for both of these approaches in planning preoperative preparation and distraction interventions. According to social learning theory, children are active learners within their environment and learn behaviors vicariously through others (Boles, 2016; Turner, 2009). The focal points of learning based on this theory are attention, retention, imitation and reinforcement; observational learning, or modeling, is also a key component of this perspective (Turner, 2009). Children encounter models within their natural environments on a regular basis; parents, peers, teachers, and people on TV all serve as behavioral examples for children to imitate. In the context of the hospital, modeling interventions aim to provide children and their families with accurate examples of the new situations they will encounter. The goals are to give children opportunities to engage in intriguing and enjoyable modeling interventions, and facilitate retention through imitation of what they have seen, and receive positive reinforcement for the new behavior. Ultimately, modeling interventions are designed to build self-esteem and feelings of mastery (Turner, 2009), which are factors that help reduce anxiety. Traditional examples of modeling interventions include picture books, puppets, and video tapes (Turner, 2009). New technology platforms support modeling interventions in the form of virtual reality experiences and tablet-based applications (Chow et al., 2017; Eijlers et al., 2017). Modeling interventions prior to surgery or a medical procedure are seen as an

effective method for reducing perioperative anxiety (Melamed & Siegel, 1975; Wright et al., 2007).

Stress and Coping Theory

Lazarus and Folkman's stress and coping theory also plays a role in understanding the importance of preoperative preparation and distraction. Based on this theory, "whether or not a given event is stressful depends on the perceptions of the individual experiencing the event" (Tiedeman & Clatworthy, 1990, p.334). Individuals make cognitive appraisals about events in order to evaluate the demands of the event versus their available resources to cope with the event; when the demands appear to exceed one's coping resources, an individual may experience stress or anxiety. Age or developmental level, past experiences, and responses of others in the environment are factors that effect appraisals (Brewer et al., 2006), which ties in stage theory as well as information processing theory. "Hospitalization is an event during and after which children may perceive that demands tax or exceed resources, an event leading to stress and increased anxiety" (Tiedeman & Clatworthy, 1990, p.335). When child life specialists introduce coping strategies via preoperative preparation or distraction interventions, children may begin to appraise their situation differently; the child may no longer perceive that the demands of hospitalization exceed his/her coping resources, the result of which may be less stress or anxiety (Boles, 2016).

Psychosocial Development and Therapeutic Relationships

The aforementioned theories pertain to cognitive processes and their role in preoperative preparation and distraction interventions. A key element that must be tied into the cognitive aspects of a child processing his or her hospital experience is

psychosocial development: when a child is hospitalized, their ability to cognitively process the experience is in part dependent upon their psychosocial needs being addressed. Eric Erikson's psychosocial development theory discusses eight stages of internal conflict that children face throughout their development (Turner, 2009). Child life specialists know these stages and use their correlation with chronological age to determine and appropriately address a child's psychosocial and developmental needs. The first and most critical stage of Erikson's theory is trust versus mistrust, the goal of which is for a child to experience both trust and mistrust in the early stages of life but ultimately come to know a "favorable balance of trust over mistrust" (McCue, 2009, p. 66). In the hospital, child life specialists address this by providing consistent care that aids in establish a trusting relationship with a child.

For hospitalized children, trust is of paramount importance. Trust provides the foundation for the supportive, humanistic, and therapeutic relationship offered by the child life specialist to the patient (McCue, 2009). Based on the work of Carl Rogers, therapeutic relationships are the "most significant element of change and healing" (McCue, 2009, p. 63). Establishing a trusting relationship is also known as key component of successful preoperative preparation and distraction interventions (AAP, 2014; O, Connor-Von, 2000). Once trust is established, the therapeutic aspects of the relationship allow the child life specialist to address the specific psychosocial and emotional needs of the child during preoperative preparation and distraction interventions and throughout the child's hospital experience. In doing so, the child is given opportunities for emotional expression, resolution of psychosocial conflict, and healing. "An ideal and truly comprehensive child life relationship includes all the components of a

supportive relationship, all components of a therapeutic relationship, and specific reference to maintaining normalcy and preventing development of negative psychosocial sequelae” (McCue, 2009, p. 76).

2.2 Childrens’ emotional responses to medical procedures and surgery

In a study of hospitalized and non-hospitalized twins, Sipowicz and Vernon (1965) confirmed the hypothesis that together, hospitalization and illness are psychologically upsetting for children, even if the experience is brief and/or routine. Vernon, Schulman, and Foley (1966) conducted a study on the post hospitalization behavioral responses of children; their work confirmed the findings of Sipowicz and Vernon (1965) and expanded on the resulting behavioral responses. A parental comparison of behaviors before and after hospitalization revealed that the result of psychological upset due to hospitalization was increased separation anxiety, increased sleep anxiety, and increased aggression towards authority. Kain, Mayes, O’Connor, and Cicchetti (1996) studied preoperative anxiety in children ages two to ten and found nightmares, separation anxiety, eating problems, and increased fear of physicians to be the most common negative behavioral responses present two weeks following surgery. They also reported that 54% of the 163 study participants experienced some type of negative behavioral response two weeks following surgery; a smaller percentage of children experienced negative effects for a longer period of time (i.e., 6 to 12 months) and developed long-lasting psychological effects (Kain & Caldwell-Andrews, 2005). Negative effects of hospitalization have been cited by others as regression, separation anxiety, sleep anxiety, eating disturbance, and serious aggression (O’Conner-Von, 2000);

up to 88% of children have been found to experience maladapted behavior post hospitalization and surgery (Kain, Mayes, O'Connor, & Cicchetti, 1996).

In one of the first studies of its kind, Kain, Mayes, Caldwell-Andrews, Karas, and McClain (2006) determined that increased preoperative anxiety correlated with increased general anxiety, sleeping problems, and decreased postoperative eating improvement. The study also uncovered a relationship between increased preoperative anxiety and postoperative pain and analgesic consumption. Higher levels of preoperative anxiety were determined to be predictive of a slower and more painful postoperative recovery; children with higher anxiety preoperatively consistently reported higher levels of pain postoperatively.

Fortier, Del Resario, Martin, and Kain (2010) completed a study on perioperative anxiety in children, which was found to be "significantly and positively correlated with pain within the first 24 [hours] after surgery and new onset-negative behavioral change in the 2 weeks following surgery" (p. 320). Anxiety was rated throughout the perioperative experience (e.g., in the preoperative holding area, upon separating from parents, entry to induction area, introduction of anesthesia mask, immediately following surgery, and for two weeks at home following surgery). Significant increases in anxiety were found prior to surgery, the peak of anxiety coincided with the introduction of the anesthesia mask. Anxiety gradually, and significantly, decreased postoperatively (i.e., in the hospital, over the course of the two weeks measured at home). Similar results were found in an earlier study on perioperative anxiety; anxiety increased upon initial hospitalization and decreased as coping strategies were introduced or learned during hospitalization (Tiedman & Clatworth, 1990). Tiedman and Clatworth (1990) and Fortier et al. (2010)

noted that while anxiety decreased postoperatively, there were spikes of increased anxiety associated with transitions that occur in the postoperative period (i.e., relocating to a new areas within the hospital and going home).

Research indicates that efforts to prevent or reduce perioperative anxiety for children may result in improved postoperative outcomes (e.g., reduced postoperative pain, improved behavioral recovery) and the necessity of continuous improvement in methods used to reduce perioperative anxiety is established (Kain et al., 2006; Fortier et al., 2010; O’Conner-Von, 2000).

2.3 Non-Pharmacological interventions used to reduce perioperative anxiety

Tiedeman and Clatworthy (1990) emphasized the need for supporting children by offering interventions that focus on increasing knowledge and understanding and facilitate coping behaviors. Non-pharmacological interventions (i.e., preoperative preparation, distraction) are a way of doing this; added benefits include: (1) improved child cooperation, (2) lower cost than pharmacological interventions (i.e., medication), and (3) equality as effective in reducing preoperative anxiety as medication (Liguori et al, 2016).

Preoperative Preparation

In an integrative research review, O’Connon-Von (2000) stressed the importance of preoperative preparation for all children and the continued development of “preparation strategies that meet the unique needs of children” (p. 341). The unfamiliarity of the hospital (e.g., surgical settings, routines, clothing, sights, sounds, smells), experience of loss of control, threatening appearance of medical equipment, and anticipation of pain, discomfort or physical harm contribute to children’s emotional

response(s) to hospitalization (O’Conner-Von, 2000; Panella, 2016; Tiedman and Clatworth, 1990). These causes, in conjunction with factors such as age, gender, length of stay, presence of and/or quality of previous hospital experience(s), parental anxiety, and child temperament account for the variation among potential perioperative anxiety levels and call for preparation methods that account for the characteristics of each individual child (Kain & Caldwell-Andrews, 2005; Kain, Mayes, O’Connor, & Cicchetti, 1996; Fortier, Del Resario, Martin, & Kain, 2010; Tiedeman & Clatworthy, 1990).

Melamed and Siegel (1975) explained, “All children need some kind of psychological preparation for the hospital experience, particularly when accompanied by surgery. The need for preparation is predicted on the belief that hospitalization and surgery are stressful and anxiety-provoking experiences that can lead to transient or long-term psychological disturbances in most children" (p. 511). In the classic 1965 review by T. A. Vernon, as cited by O’Connor-Von (2000), three essential components of preparation programs were established: (1) providing information to the child about the experience, (2) encouraging emotional expression of concerns, and (3) establishing a trusting relationship with the health care provider. According to AAP (2014), current practices hold to Vernon’s three elements, with the only addendum being that the information provided must be developmentally appropriate. Child life specialists typically carry out preoperative preparation programs (Kain & Caldwell-Andrews, 2005), thus providing element 3, and have been know to provide elements 1 and 2 in the following ways: a) providing individualized and developmentally appropriate information about the surgery or procedure, (b) tours of preoperative, operative, and postoperative spaces, (c) medical play, (d) modeling, (e) developing coping plans or strategies, and (f)

facilitating parental involvement and education (Kain, Mayes, & Caramico, 1996; Koller, 2007; Wright et al., 2007). Boles (2016) concluded from a review of literature that a combination of the above methods is more effective than using any one method on its own. For example, the use of film modeling (e.g., a video of a child undergoing a similar hospital experience) as a form of preparation has been proven to be a successful method for reducing preoperative anxiety (Melamed & Siegel, 1975). Demarest, Erickson, and Hooke (1984), however, determined that children who received film modeling and medical play interventions experienced significantly less anxiety than child who received only a modeling intervention.

With regards to perioperative anxiety, the literature raises concerns that preoperative preparation, whether facilitated by a child life specialist or not, is effective in reducing anxiety immediately following preparation and/or in the preoperative holding area (i.e., waiting room, at separation for the operating room) but not necessarily at the induction of anesthesia and/or on the day ward (i.e., recovery room) following surgery (Kain & Caldwell-Andrews, 2005; Glasper, Keeton, Rice, & Spargo, 2008; Wright et al., 2007). While it is recognized that the timing of preparation is an important factor in its effectiveness in reducing perioperative anxiety (i.e., preparing children days in advance rather than hours before surgery) (Fincher, Shaw, & Ramelet, 2012), it remains important to find interventions that lower anxiety throughout the perioperative experience, not just in the preoperative period. Ultimately:

education and proper preparation may contribute to transforming a potentially negative and harmful experience into a formative and empowering one. Good psycho-educational preparation helps the child to gain sense of the experience and

replaces a feeling of powerlessness with a sense of mastery, thanks to active and effective coping skills. (Capurso & Ragni, 2016, p. 183)

Distraction

The literature on distraction interventions is not as extensive as that of preoperative preparation programs but none-the-less supports its effectiveness in lowering children's preoperative anxiety and pain during procedures (Kain & Caldwell-Andrews, 20015). Child life specialists use developmentally appropriate items such as bubbles, pop-up and sound books, light-up toys, and visual and auditory tools to divert the child's attention during painful or anxiety provoking procedures towards more positive or pleasant stimuli (AAP, 2014; Capurso & Ragni, 2016). The use of mobile devices (e.g., iPads or tablets) as distraction tools is a more recent strategy that has evidence for reducing children's perceptions of pain and anxiety during medical procedures (AAP, 2014).

While preoperative preparation does not have undisputed support for its effectiveness in reducing anxiety throughout the perioperative experience, the use of distraction tools (i.e., toys, tablet-based games) has been found to reduce anxiety and the use of pharmacological interventions at induction of anesthesia and during painful procedures (Burns-Nader et al., 2017; Capurso & Ragni, 2016).

2.4 Role of the child life specialist in reducing perioperative anxiety

In one of the first studies of the effectiveness of a child life program, it was found that children experienced less emotional distress and more coping effectiveness during procedures, better overall coping and adjustment during the hospital stay, had increased understanding of hospitalization and procedures, experienced significantly better

recovery after surgery, and had improved post hospital adjustment and physical recovery (Wolfer et al., 1988). Since this time, child life specialists have become the resident experts on child development and the standard for addressing psychosocial care of pediatric patients (AAP, 2014; Boles, 2016; O’Conner-Von 2000; Panella, 2016). Their role is to facilitate coping through developmentally appropriate education, preparation, play, and emotional expression as well as provide family support. Brewer et al. (2006) found results to dispute the findings that child life preparation only helps in the immediate preoperative period (i.e., holding areas); their results showed that child life preparation “can continue to minimize children’s anxiety up to 1 month postoperatively” (p. 20). Wright, Stewart, Finely, and Buffett-Jerrott (2007) listed child life preparation as one of most effective components of preparation programs.

Kain, Mayes, and Caramico (1996) completed a study evaluating a preoperative preparation program that included: (1) providing information about the perioperative experience, (2) an orientation tour, (3) medical play by a Child Life Specialist, and (4) an interactive tour of the operating room and the recovery area. The results showed the preparation program was “not uniformly effective for all outpatient children undergoing elective surgery” (p.512); age, timing of the preparation, and previous hospital experiences all had an effect on the success of the intervention. Other studies have also emphasized the importance of taking into account all child factors (i.e., age, gender, previous hospital experience, length of hospital stay, parental anxiety) that may influence anxiety when planning or administering preoperative preparation (Tiedman & Clatworthy, 1990). Child life specialists are uniquely positioned to both build rapport with children and families and understand the developmental factors involved with

hospitalization, so they are able to provide individualized support for children when planning for, and/or implementing, either preoperative preparation or distraction.

Child life specialists take on the role of developing supportive relationships with patients and families (Kain & Cladwell-Andrews, 2005; Koller, 2007), which has been established as an essential component in reducing anxiety (O'Connor-Von, 2000). In the absence of a supportive relationship, interventions may not be as successful in reducing preoperative anxiety; “it requires a certain level of trust to believe that one is safe in the hands of strangers in an unfamiliar environment—and it can be especially frightening when one is a child and those strangers are medical staff” (Boles, 2016, p. 147).

Overall, “Child life services improve quality and outcomes in pediatric care as well as the patient and family experience” (AAP, 2014, p. e1475). They may also help improve the patient experience and lower costs by reducing patient length of stay and consumption of sedative and analgesic medications via implementation of non-pharmacological interventions (AAP, 2014). The many benefits of child life interventions have been established in the literature; the addition of new technology platforms in the realm of preoperative preparation and distraction by a child life specialist will be explored in this study.

2.5 Technology applications for reducing perioperative anxiety

The National Association for the Education of Young Children (NAEYC) and Fred Rogers Center (FRC) (2012) take the stance that “when used wisely, technology and media can support learning and relationships” (p.1). Knowledge of child development, as well as the positive and negative aspects of children using technology, is required in order for new technology platforms to be implemented in a way that is intentional and

optimizes learning potential for all children. Providing children with guidance when using technology is recommended in order to avoid inappropriate use. Technology is not recommended as a replacement for “other beneficial educational activities such as creative play, outdoor experiences, and social interactions with peers and adults in early childhood settings” (pp. 11-12); rather, a balanced variety of activities should be provided, with technology being only one facet of learning. Child life specialists are in the position to provide the developmental background, the necessary guidance, a relationship, and supplemental learning formats.

Utilization of new technology platforms is growing due to accessibility and flexibility (i.e., how and where they can be accessed, portability, customization; Burns-Nader et al., 2017; Rassin et al., 2004) as well as ease of use and cost-effectiveness (Chow et al., 2017; Liguori et al., 2016). Children are attracted to technology due to its perceived fun and familiarity; children often prefer computer-assisted learning to other learning methods (Dorman, 1997; Rassin et al., 2004). Rassin, Gutman, and Silner (2004) stated, “in preparing children to cope with situations of illness and medical intervention, one should follow the winds of change and develop new and creative ways that are in line with the children's world and desires” (p. 1102). Dorman (1997) promoted the use of video games as a way of capturing and sustaining the attention of children and adolescents in order to provide and facilitate meaningful interactions with information; health promoters are challenged to “understand how this technology can be harnessed to improve health” because it “may provide an important way to improve the health of many children and adults of an increasing technologically based society” (p. 137). This responsibility now lies with Child Life staff and departments.

The literature on the use of technology in reducing perioperative anxiety consists of studies on web or computer-based preparation, tablet-based application preparation and distraction, and virtual reality.

Web or computer-based preparation programs

Chartrand, Clendinneng, Gaboury, and Tourigny (2011) evaluated the effects of a web-based “Surgery Virtual Tour” application on children’s knowledge and emotional distress and found that the tour increased knowledge significantly but did not significantly impact emotional distress. They reported high patient satisfaction with the program. The virtual tour included all perioperative settings (i.e., the day surgery unit, operating room, the recovery room), the equipment used in each setting, and explained the events that would occur in each place; 180-degree navigation added an interactive component that allowed participants to select, view, and find out more information on the setting and equipment. Children liked having the ability to see and “walk around” the various settings and equipment along with receiving relevant and detailed information. The authors concluded implementing the participant-suggested improvements (e.g., increasing interactivity level, adding elements of user creativity, and providing more information about equipment in different rooms) would improve the significance of the findings, emphasizing that web-based preoperative preparation programs are not suited to replace the role of personnel that support children on the day of surgery. There is value in responsive interventions that provide reassurance, answer questions, and correct erroneous ideas for anxious patients and parents in the perioperative period.

Fortier et al. (2015) studied WebTIPS, a web-based tailored preoperative preparation program, through a small-scale preliminary trial and found it to be an

effective intervention for reducing both children's and parent's preoperative anxiety.

Additional program benefits included: (1) improved immediate behavioral outcomes, (2) decreased emergence of delirium in children undergoing surgery, (3) clinically significant shorter post anesthesia care unit (PACU) stays, and (4) high satisfaction ratings.

WebTIPS was designed for children ages 2 to 7 years old and their parents. Both parent and child had their own website tailored to their individual characteristics (i.e., trait anxiety and type of surgery for child; baseline anxiety, coping style, pain management attitudes, and preferences for sedative premedication and parental presence at anesthesia induction for children). The websites provided appropriate information, modeling, coping skills training, and incorporated several multimedia components (e.g., animation, motion graphics, video, audio). The experience consisted of four modules that covered the perioperative period (i.e., home [preoperative], preoperative holding area, anesthesia induction, surgery, PACU, and home [postoperative]). WebTIPS addressed the issue of accessibility, as it was available from any web browser and could be used both before and after the hospital experience.

Tablet-based applications used in preoperative preparation and distraction

Liguori et al., (2016) found that a tablet-based app (Clickamico) used for preoperative preparation resulted in a statistically significant reduction in preoperative anxiety just before entering the operating room for children ages 6 to 11 years old. The authors expressed confidence in attributing the reduction in anxiety to the app because children who received the intervention did not have statistically significant characteristic differences (i.e., age, sex, age of parents, previous surgical experience) than the control group but did experience significantly lower preoperative anxiety. The intervention itself

consisted of a 6-minute video of two clown doctors giving a tour of the operating room; they provided technically accurate information in a playful and funny manner. Information provided during the tour pertained to objects and situations the child could expect to encounter. The child had the opportunity to ask a nurse questions during and after the video.

Chow et al. (2017) examined the effectiveness of Story-Telling Medicine (STM), a tablet-based application consisting of a 20-minute intervention that utilized an animated character to lead children through the perioperative experience. The intended use of the program was preoperative preparation and distraction with the goal of reducing preoperative anxiety. In addition to using STM, children received usual care the day of surgery (i.e., child life specialist preparation via education and teaching of coping skill). The combination of STM and usual care intervention resulted in a statistically significant reduction in anxiety as compared to children who participated in the usual care intervention only. Authors noted that day of use “showed that STM [could] be delivered without interfering with normal hospital routines and/or clinical flow and could potentially serve as an adjunctive therapy to [usual care] given its ease of use” (p. 414). This example supports the combination of child life services and new technology platforms.

Patel et al. (2006) explored the use of a tablet-based interactive video game as a means of distraction; the goal was to establish the efficacy of the application in reducing preoperative anxiety in children. Video games are both familiar and engrossing for children, thus making them ideal tools for distraction. This particular hand-held video game was successful in reducing anxiety of 4 to 12 year old children at the induction of

anesthesia, a point that is known to be the peak of stress and preoperative anxiety. The effectiveness may be attributed to the interactive nature of the game allowing children to experience both cognitive and motor absorption, thus drawing their attention from more stressful stimuli.

Burns-Nader, Joe, and Pinioin (2017) applied a tablet-based distraction application to reducing pain and anxiety during hydrotherapy procedures for pediatric burn patients. Child life specialists took an individualized approach (i.e., considering the participant's development, procedure, and needs) and supplied children with a variety of developmentally appropriate and engaging iPad application choices (i.e., interactive games). The child life specialist implemented the tablet distraction and offered psychosocial support (i.e., initiating and continuing attention on the tablet, playing for the participant when necessary, offering verbal support, praise, and comfort, and promoting breathing and pain management technique) throughout the procedure. Child life specialist supported tablet-based distraction was proven to reduce anxiety for pediatric patients undergoing hydrotherapy. The results indicated that the support provided by the child life specialist influenced the effectiveness of the application; the effectiveness of the application on its own has not been determined.

Virtual reality

Eijlers et al. (2017) developed a virtual reality exposure [VRE] tool called PREVIEW (PREoperative Virtual reality Intervention to Enhance Wellbeing) with the aim of providing children with gradual exposure to perioperative settings; the results of such exposure is expected to reduce preoperative anxiety and improve clinical and psychological outcomes. The idea behind VRE is that allowing children to experience

highly realistic, child-friendly, dynamic, and interactive environments that resemble perioperative settings will prepare them for surgery and general anesthesia. The VRE is approximately 15 minutes long and is guided by virtual hospital personal; the participant travels through the perioperative experience from the perspective of the patient and has the ability to interact with the environment (i.e., point to objects they would like to know more about). The randomized controlled trial study to determine the effectiveness of PREVIEW is underway; it will be the first true experimental study of VRE.

Summary

The use of new technology platforms in preoperative preparation and distraction is a growing field. The literature reviewed provided examples of preliminary evidence of the effectiveness for using new technology platforms as tools for non-pharmacological interventions. The preliminary evidence may lead to evidence-based practices as future studies measure implementation and generalization.

2.6 Child life specialist perspectives on using technology to support non-pharmacological interventions and reduce perioperative anxiety

New technology platforms are increasing in popularity for child life specialists (Burns-Nader et al., 2017). As the popularity and evidence base for child life technology platforms increases, it is important to understand how child life professionals view the use and implementation of these non-pharmacological interventions. The review of literature did not reveal any research explaining the use and effectiveness of technology-based non-pharmacological interventions from the perspective of the child life specialist.

2.7 Summary

Child life specialists can intentionally create and/or implement new technology platforms in a way that harnesses their potential for enjoyment, engagement, and relationship building, all of which are factors in facilitating learning and reducing perioperative anxiety. Some traditional elements of preoperative preparation programs (i.e., tours of the operating room and PACU), while effective, have barriers to accessibility (i.e., staff availability, room availability, staff time and workload; Chow et al. 2017; Eijlers et al., 2017; Liguori et al., 2016); new technology platforms have potential to remove these barriers. The review of literature revealed the concern that traditional preparation and distraction methods may not reduce anxiety at the point of anesthesia induction or during painful procedures; recent research on new technology platforms has proven to be effective in this regard.

Kain and Caldwell-Andrews (2005) believe the “future will be characterized by the development and implementation of computerized multimedia displays and interactive technology” (p. 601) because it is cost effective and individualized to address a variety of topics (i.e., procedures, surgeries, diagnoses) and coping styles. Existing literature demonstrates that non-pharmacological interventions can and should be offered to children facing hospitalization because of their effectiveness in reducing perioperative anxiety and improving behavioral outcomes. The responsibility of the healthcare practitioner (i.e., child life specialists) is to strive for continual improvement in their methods of providing non-pharmacological interventions. If designed and implemented properly, new technology platforms show potential to provide this necessary growth and improvement.

CHAPTER 3: METHOD

The study investigated certified child life specialists' perceptions on the use of new technology platforms in preoperative preparation and distraction interventions. This study utilized a non-experimental quantitative descriptive design and survey methodology to gather information regarding the feelings of hope or reservation that child life specialists have about these instruments (i.e., virtual reality, iPads, tablets) in relation to how they will change or enhance the CCLS role in preoperative preparation and distraction. A survey was distributed to participants via email. Participants were recruited via convenience sample using the Association of Child Life Professionals (ACLP) general community forum, emailing child life program directors in four Southeastern states, and reaching out to professional contacts of the researcher and researcher's committee members. Participation in the survey was voluntary and no compensation or incentive was offered to participants.

3.1 Rationale

New technology platforms have been introduced as non-pharmacological interventions and have been successful in reducing perioperative anxiety for children, yet the perspective of those implementing and carrying out the interventions (i.e., the child life specialists) was not reported in existing literature.

3.2 Recruitment

The study took place online via electronic survey hosted on SurveyShare.com, a secure hosting site. Participants were recruited through the ACLP's general forum, professional contacts, and by emailing program directors for all child life programs four states in the Southeast who make their contact information publicly available in the

ACLP program directory. More than 5,000 ACLP members had access to the general forum in order to “to exchange information, share thoughts and opinions, and provide answers to questions and challenges faced by their peers” (Association of Child Life Professionals, n. d.). Program directors and professional contacts were asked to forward the email they receive to their staff members. The survey was accessible through an electronic link. Participants were able to complete the survey at a time and location convenient to them; the survey was open for 29 days.

3.3 Participants

Certified child life specialists (68 female, 1 male) participated in the study. The criteria for inclusion was: 1) current status of certified child life specialist, 2) current employment in a role that offers preoperative preparation to pediatric patients in an inpatient or outpatient setting, 3) working within the United States, and 4) ability to read and respond in English. Those who did not currently hold CCLS status (i.e., students, interns, retired professionals) were excluded from the study. A total of 71 participants completed the survey; one participant did not meet the inclusion criteria of currently working within the United States and one participant did not complete the survey beyond demographic information. Both participants were excluded from the data, resulting in a total of 69 participants.

Demographic data were collected (refer to Table 1 for participant demographics). Participants ranged between 20 and 60 years of age, 86.8% identified as 20-40 years-of-age, and 89.9% of participants identified as White. The resulting age and race/ethnicity demographics of the sample were expected. The majority of participants held a bachelor’s degree (55.1%) and had worked as a CCLS for 0-7 years (58%). Table 2

shows participant employment location by state. Eighteen (26.1%) participants were from North Carolina and 10 (14.5%) participants were from Georgia; there were five or fewer participants from all other states.

3.4 Procedure

The researcher obtained IRB approval and then conducted a pilot study. Four certified child life specialists from a local children's hospital piloted the survey instrument in order to establish content and social validity; these participants did not take part in the main study. Feedback from the pilot study was used to make necessary amendments to the survey; only minor changes to formatting and wording were made.

Recruitment of participants via the ACLP general forum, professional contacts, and emailing child life program directors began once the pilot study was complete. A call for participants was posted in the ACLP community forum (see Appendix B for the ACLP posting) and distributed via email to professional contacts and approximately 30 child life program directors (see Appendix C for the e-mail recruitment text); those who were willing to participate in the study, and met the inclusion criteria, followed the provided link and completed the survey. The call for participants included a request for participation, brief overview of the study, inclusion criteria, consent, a link to the survey, and the survey deadline; an informational flyer, containing detailed study and consent information, was attached (see Appendix D for recruitment materials). As part of the survey, participants were provided consent information and provided their consent electronically; the researcher requested a waiver of signed consent through the IRB.

Once the survey was disseminated to all participants, data was collected for four weeks (i.e. 29 days). One week after distributing the survey, the researcher distributed a

follow-up post/email to the forum/professional contacts. Forty-eight hours prior to the survey closing, a reminder post/email was distributed; this was repeated a second time 24 hours prior to the survey closing.

The ACLP stated over 5,000 members have access to the ACLP general forum but due to saturation, a low response rate was expected (i.e., 1% or less). Approximately 30 child life program directors were contacted and asked to distribute the survey to their staff members. Staff size at each hospital varied; an estimated 5 certified child life specialists per program equaled 150 possible participants. Using an estimated 40% response rate from contacting child life program directors in combination with responses gained through the ACLP general forum and professional contacts resulted in a goal of 75 participants. Ninety-two percent of this goal was met (i.e. 69 participants).

3.5 Data Collection

The study was a quantitative, non-experimental, descriptive design; descriptive data was collected using SurveyShare web-based survey software. Demographic information (e.g., age, race/ethnicity, gender, number of years working as a certified child life specialist, unit/setting of current practice, staff size, level of education, state of employment) was collected on each participant; 5-point (i.e., strongly disagree to strongly agree) Likert-type scales were used to gather attitudes, beliefs, and usage ideals towards the use of new technology platforms in preoperative preparation and distraction. Open-ended questions were used to enrich, clarify, and support numerical data; responses were reviewed and reported using thematic analysis. Once distributed via the ACLP general forum and email to professional contacts, the survey was open for four weeks (i.e., 29 days).

3.6 Instrument

Perceptions Towards the Use of New Technology Platforms in Preoperative Preparation and Distraction (Appendix E) was a researcher-created survey. The content of the survey was conceptualized based on current literature and theory. Existing surveys were used as models for the layout and content of the survey (Baş, Kubiak, & Sunbul, 2016; Šumak & Šorgo, 2016). The instrument was tested in a pilot study in order to determine content and social validity.

Survey questions (i.e., 22 questions) consisted of a combination of Likert-type rating scales, multiple choice, and open-ended questions. The survey took each individual approximately 15 minutes to complete. Participants could start, save, and come back to the survey as many times as necessary. The survey was divided into the following sections: (1) introduction and instructions, (2) consent, (3) demographic information, (4) Usage, (5) beliefs, (6) attitudes, (7) pros and cons, and (8) free response.

3.7 Data Analysis

Data were imported into IBM SPSS Statistics 25 (IBM Corp, 2017) directly from SurveyShare web-based survey software for analysis. Likert-type rating scale responses were converted into descriptive summaries (i.e., frequency, percentage, mean (*M*) and standard deviation (*SD*)) for reporting). Open-ended responses were examined by principal investigator for themes present among participants and details not gathered through Likert-type responses; results were presented using thematic analysis.

CHAPTER 4: RESULTS

The researcher gained the perception of certified child life specialists on the use of new technology platforms (NTPs) in preoperative preparation and distraction interventions and answered the following research questions: 1) How are certified child life specialists currently using, or anticipate using, new technology platforms? 2) What are certified child life specialist's perceptions (i.e., hesitation vs. enthusiasm), beliefs, and attitudes towards new technology platforms that are being introduced as methods for preoperative preparation and distraction? 3) To what extent do certified child life specialists see new technology platforms as a complement/replacement and improvement/detriment to their current efforts to reduce perioperative anxiety via preoperative preparation and distraction interventions? and 4) What are the pros and cons associated with the implementation of new technology platforms and their potential to affect the role of the certified child life specialist? The results are separated by research question; thematic analysis of open-ended questions is included within research question sections where applicable. An additional section is included for thematic analysis that applies to multiple research questions and overall study concepts.

4.1 Research Question 1

The first research question answered for what purpose certified child life specialists were currently using, or anticipate using, new technology platforms, what kind of new technology platforms were being used, and identified motivation factors for their use. Most participants reported that they were currently using new technology platforms for the purposes of preoperative preparation ($n = 52, 75.4\%$) and distraction ($n = 65, 94.2\%$). Very few participants anticipated using new technology platforms for

preoperative preparation ($n = 10$, 14.5%) and distraction ($n = 7$, 10.1%). There were no participants not currently using NTPs that selected “*I do not anticipate using new technology platforms.*”

Participants indicated what type of new technology platform they were using or anticipated using. All 69 participants selected tablet-based applications, while 37 participants (53.7%) selected virtual reality, 15 participants (21.7%) selected web-based applications, and 4 participants selected other. Responses for other included video games ($n = 2$), movie goggles for MRI use ($n = 1$), and ViewFinder augmented reality ($n = 1$).

Motivation for using new technology platforms was indicated by participants (see Table 3 for motivations for using NTPs). There were nine options to choose from alongside the option to write in a response. The top four responses were: improve patient experience (85.5%), reduce perioperative anxiety (85.5%), improve patient engagement (81.2%), and improve patient knowledge (81.2%). Write-in responses included coping, reduce overall anxiety, improve patient compliance and prepare patients for procedures, and decrease use of anesthesia.

Current use of new technology platforms by certified child life specialists to conduct preoperative preparation and distraction interventions was investigated using 5-point Likert-type rating scales. The same seven questions were asked for each intervention type (i.e. preoperative preparation, distraction interventions); the rating scale options were: *strongly disagree* (1), *somewhat disagree* (2), *neither agree nor disagree* (3), *somewhat agree* (4), and *strongly agree* (5). The number of participants varied based on intervention type as participants were asked to respond only if they were *currently using* new technology platforms in preoperative preparation and/or distraction

interventions. Participants that were anticipating using new technology platforms or were only using new technology platforms for preoperative preparation or distraction were asked to skip to the next section. The percentages provided in the following two sub-sections are out of the number of participants that responded to the respective questions; the number of participants for each question is provided.

Usage in Preoperative Preparation

Fifty-one participants (73.9%) responded to questions relating to current use of NTPs (see Table 4 for current use of new technology responses). One of the seven questions was missing 1 response; it is the researchers belief that this is due to participant error. Participants *somewhat agreed* that they used NTPs in preoperative preparation as often as possible ($M = 3.73$, $SD = 1.17$), the use of NTPs required fewer resources (i.e., time, materials, space) in order to carry out preoperative preparation ($M = 3.80$, $SD = 1.02$), the use of NTPs allowed them to individualize preoperative preparation for each patient ($M = 3.59$, $SD = 1.15$), and they were satisfied with the use of NTPs in preoperative preparation ($M = 4.10$, $SD = 0.07$). Participants *neither agreed nor disagreed* that they give priority to the use of NTPs in preoperative preparation over other methods ($M = 3.22$, $SD = 1.18$), the use of NTPs in preoperative preparation is more effective than previously used methods/tools (i.e., there is observable evidence of reduced perioperative anxiety) ($M = 3.12$, $SD = 0.89$), and the use of NTPs has replaced previous methods/tools used for preoperative preparation ($M = 3.27$, $SD = 1.30$).

Usage in Distraction

Sixty-six participants (95.7%) responded to questions pertaining to using NTPs in distraction interventions (see Table 5 for distraction intervention responses). Two of the

seven questions were missing 1 response; it is the researchers belief that this is due to participant error (i.e. question oversight) as the missing responses came from two different participants. The responses for the usage of new technology platforms in distraction interventions mirror those of preoperative preparation.

Participants agreed the use of NTPs required fewer resources in order to carry out distraction interventions ($M = 3.74, SD = 1.04$), allowed for distraction interventions to be individualized for each patient ($M = 4.03, SD = 0.79$), and were satisfied with the use of NTPs for distraction interventions ($M = 4.12, SD = 0.87$). Participants indicated they *neither agreed nor disagreed* that they give priority to the use of NTPs for distraction ($M = 2.85, SD = 1.27$), the use of NTPs is more effective than previously used interventions ($M = 3.17, SD = 1.00$), or has replaced previous methods/tools for distraction interventions ($M = 2.91, SD = 1.21$). The majority of participants ($n = 26, 39.4\%$) *somewhat agreed* that they use NTPs as often as possible ($M = 3.38, SD = 1.15$) but 13 participants *neither agreed nor disagreed*, 13 *somewhat disagreed*, and four *strongly disagreed*.

4.2 Research Question 2

Research question 2 answered questions about how certified child life specialists feel, what they believe, and their attitudes towards new technology platforms being introduced and used as methods for preoperative preparation and distraction interventions. Responses are reported in the following sections and are based on the same 5-point Likert-type rating scale described in the previous section (refer to 4.1 Research Question 1).

Administrative attitude

Most (81.2%) participants indicated that they felt that their administration was supportive of the use of new technology platforms; only 2.9% of participants felt that their administration was resistant to the use of new technology platforms.

Beliefs

Participants who were currently using or anticipating using NTPs in preoperative preparation and distraction interventions responded to questions about their beliefs in using NTPs (see Table 6 and Table 7 for participant responses). This accounts for the varying response rates as compared to the aforementioned questions about usage of NTPs in preoperative preparation and distraction interventions.

Preoperative Preparation (n = 60). Participants indicated the belief that NTPs enhance patient learning ($M = 4.33$, $SD = 0.65$), enhance patient coping skills ($M = 3.98$, $SD = 0.76$), help reduce stress and anxiety for patients in the perioperative period ($M = 4.30$, $SD = 0.59$), present patients with important life-like learning experiences ($M = 3.87$, $SD = 1.01$), and are powerful tools to help patients understand abstract content ($M = 3.93$, $SD = 0.96$). A strong majority (86.6%) of participants agreed that the role of the child life specialist is essential when using NTPs for preoperative preparation ($M = 4.47$, $SD = 0.87$). Participants did not believe that NTPs reduced the need for their involvement in preoperative preparation ($M = 1.21$, $SD = 0.45$), empower staff outside of child life to conduct preoperative preparation ($M = 2.33$, $SD = 1.14$), or should be used by staff outside of child life to conduct preoperative preparation ($M = 2.02$, $SD = 0.98$). Participants neither agreed nor disagreed that all patients should be considered for preoperative preparation using new technology platforms ($M = 3.05$, $SD = 1.20$).

Distraction (n = 66). Participants indicated the belief that NTPs enhance patient coping skills ($M = 4.16$, $SD = 0.73$) and help reduce stress and anxiety for patients in the perioperative period ($M = 4.29$, $SD = 0.65$). Most (84.8%) participants agreed that the role of the child life specialist is essential when using NTPs for distraction interventions ($M = 4.47$, $SD = 0.87$). Participants did not believe that NTPs reduce the need for their involvement in distraction interventions ($M = 1.57$, $SD = 0.87$) or should be used by staff outside of child life to conduct distraction interventions ($M = 2.24$, $SD = 1.19$). Participants neither agreed nor disagreed that all patients should be considered for preoperative preparation using new technology platforms ($M = 3.05$, $SD = 1.20$) and that NTPs empower staff outside of child life to conduct distraction interventions ($M = 2.75$, $SD = 1.28$).

Attitudes

Participants indicated their attitudes and perceptions towards utilizing NTPs (see Table 8 for participant responses). Only those participants using NTPs for preoperative preparation indicated attitudes about the use of NTPs.

Preoperative Preparation (n = 60). There is a generally positive attitude towards the use of NTPs in preoperative preparation. Participants indicated that they feel NTPs add value ($M = 4.38$, $SD = 0.69$), are important ($M = 4.12$, $SD = 0.87$), make the preparation process more interesting ($M = 4.29$, $SD = 0.72$), make patients more motivated ($M = 3.90$, $SD = 0.88$), make content more functional and accessible ($M = 4.36$, $SD = 0.79$), and help children understand abstract concepts ($M = 3.92$, $SD = 0.94$). They also indicated that using NTPs is something they want to do ($M = 4.24$, $SD = 0.75$), is enjoyable for them ($M = 4.08$, $SD = 0.92$), is enjoyable for the patient ($M = 4.39$, $SD =$

0.67), allows them to do their job effectively ($M = 3.98, SD = 0.83$), has the flexibility needed to do their job ($M = 4.02, SD = 0.82$), and is something they felt prepared to do ($M = 1.77, SD = 1.03$). Participants did not agree that the use of NTPs is a bad idea ($M = 1.65, SD = 0.90$) or intimidating and neither agreed nor disagreed that it may be frustrating at times ($M = 3.17, SD = 1.28$).

4.3 Research Question 3

Research question 3 provided insight on the extent to which certified child life specialists see new technology platforms as a complement/replacement and improvement/detriment to their current efforts to reduce perioperative anxiety via preoperative preparation and distraction interventions. Participants indicated they believe that NTPs enhance the preoperative preparation they provide ($M = 4.15, SD = 0.68$) and should be used as a complement, or addition, to the preoperative preparation services they already provide ($M = 4.48, SD = 0.70$). Participants did not believe that NTPs should be use in leu of their current practices for preoperative preparation ($M = 1.97, SD = 0.89$). Participants neither agreed nor disagreed that using NTPs was more enjoyable for patients than other methods/tools ($M = 3.43, SD = 0.95$).

The results for distraction interventions were similar. Participants believed that NTPs enhance the distraction services they provide ($M = 4.07, SD = 0.77$) and should be used as a complement, or addition, to the distraction services they already provide ($M = 4.55, SD = .81$). Participants did not believe that NTPs should be use in leu of their current practices for distraction interventions ($M = 1.82, SD = 1.00$). This relates to the usage data discussed in section 4.1; the use of NTPs for distraction is affected by the

belief that NTPs are an added tool for certified child life specialists to utilize rather than a tool to replace other tools they may have previously used.

4.4 Research Question 4

Using a 9-point Likert-type rating scale, participants rated the extent to which they felt the implementation of NTPs had or will have a positive or negative effect on the role of the child life specialist. The majority ($n = 35$, 50.7%) of participants felt that the implementation of NTPs had or will have a moderately positive effect on the role of child life specialists. The second highest number of participants ($n=19$, 27.5%) selected extremely positive and the third highest number of participants ($n=8$, 11.6%) selected slightly positive. Therefore, the vast majority felt that overall, NTPs have or will have a positive effect on the role of child life specialists ($M = 2.16$, $SD = 1.22$). Participants were asked to explain their response; the highlights of their responses are included in the next sub-section.

Thematic Analysis

Pros. Participants reinforced beliefs and attitudes from previous research questions in that they described they described NTPs as tools that helped them individualize interventions for patient needs, improve coping, enhance understanding and empower patients for future medical experiences. Three themes emerged for the positive aspects associated with the use of NTPs:

- *Technology is everywhere.* Participants felt that NTPs offered an up-to-date way to relate to pediatric patients and normalize the hospital environment.

One participant stated: “*NTPs are simply a new platform to do things child life has been doing for years (i.e., preparation books w/ photographs are now on*

Keynote app, videos of areas are now available on tablets instead of VCR or DVD).” CCLS reported that the familiarity of NTPs helped with quick rapport building and meeting each child where they are developmentally; technology is everywhere in today’s society and CCLS felt they must adapt, evolve, and be flexible with the way children play in order to provide familiar ways to prepare and support hospitalized children. Participants noted that they find patients to be more engaged and receptive, parents to be more involved, and patient mastery, coping, motivation, and compliance to be improved due to the familiarity and comfort provided by the use and presence of NTPs.

- *Flexibility and accessibility.* NTPs provide an easy way to always have a variety of tools on hand; they allow CCLS to use on device for several interventions (i.e., distraction, preparation, answering questions with examples and visual aids). This is helpful in a fast-paced environment (e.g., Emergency Department) and allows CCLS to feel better prepared for a variety of situations. Several participants stated that this flexibility helps their job feel more rewarding and helps them feel more efficient and engaging as a CCLS.
- *Real, concrete preparation.* NTPs can help children feel as though they are actually in an operating room or experiencing an MRI (e.g., tablet-based virtual tour of operating room, MRI experience using VR goggles). CCLS feel that this ability to allow patients to experience medical environments and procedures before they happen has increased patients since of comfort and preparedness; it helps children realize their upcoming surgery or procedure is not as scary as they anticipated. Participants believed that allowing patients to

navigate and control NTPs during preparation provides them with a sense of control over the medical environment. It is important to note that several participants mentioned the importance of NTP content being specific to the hospital or environment in which the child will actually experience (i.e., it cannot be any operating room, it must be the operating room where the child will have surgery) in order for them to be most effective.

Cons. While there is a generally positive attitude towards NTPs, participants expressed several concerns. Three themes emerged for the negative impacts, or hesitations, of the use of NTPs for preoperative preparation and distraction.

- *One size does not fit all.* Participants felt that NTPs are not appropriate for every patient and that NTPs are not one size fits all. “Old school approaches” (e.g., books, developmentally appropriate toys, medical supplies) are still helpful and better for some patients; while they are engaging for many, NTPs are not always the best or most appropriate option. Some participants also stated they felt that some patients are desensitized to NTPs because they are so prevalent and therefore, more traditional tools are more novel and engaging. Due to this, NTPs are viewed as another tool in the toolbox, not a tool to replace all others. Participants reinforced that NTPs do not replace the need for CCLS assessment, teaching healthy coping skills, offering emotional support, and being engaged and present to answer questions. The relationship and skills provided by the CCLS are still viewed with utmost importance.
- *Fear of replacement, decreased value, and role misconceptions.* CCLS do not feel that NTPs reduce the need for their presence with patients but there

appears to be an overwhelming fear that other medical professionals will view NTPs as a replacement for the skills CCLS possess. Several participants shared examples of times they felt their value and skills were replaced by NTPs; they felt they were viewed as the “iPad lady” or that staff were seeking out a NTP rather than age appropriate toys or their skills in providing assessment, education, and procedural support. Several impactful quotes from participants included:

- *“Technology can never replace a Child Life Specialist's understanding how to support children through hospitalizations, but they are vital tools that enhance our existing methods of providing preparation and support.”*
- *“It would be easy for other healthcare workers and staff to see NTPs replacing the role of child life, rather than adding value to current child life roles.”*
- *“Staff should not be intimidated to use such resources when a CCLS is unavailable, but should also understand that inanimate resources cannot replace the value of a CCLS.”*
- *NTPs are a positive thing if used appropriately but “too often I see child life specialists utilizing these resources as a complete replacement for many tools and skills we learned through our education and training and I don't want to encourage a tablet or phone as a replacement for my skills.”*

- “*The technology crutch.*” Participants expressed the desire to not depend on NTPs to provide their services; it was repeatedly stated that NTPs are just one tool inside the toolbox and that it is important not to lose sight of hands on materials that are important for patients to see and manipulate. Participants felt that NTPs are not meant to be used exclusively and that doing so would set one up for failure; foundational skills such as building rapport and facilitating developmental, therapeutic, and medical play all still have a place in the practice of child life. Participants felt a current challenge was training new students not to use NTPs as a crutch as NTPs are not always available or appropriate. One participant stated, “*As a more seasoned CCLS, I have seen newcomers to the field use NTP's a crutch without first fully developing other distraction and coping teaching methods that I believe are essential to your skills as a CCLS.*” Another stated, “*I also worry that some child life specialists will not only use the NTP as the default tool, but become actually dependent on them, negating the important aspects of touch and play with 3D [three dimensional] objects.*”

CHAPTER 5: DISCUSSION

This study was designed to describe the perspective of certified child life specialists with regards to their use of new technology platforms in preoperative preparation and distraction interventions. The researcher-designed questionnaire targeted participant's NTP usage details along with their beliefs and attitudes towards using them.

5.1 Research Question 1

The first research question answered for what purpose child life specialists were currently using, or anticipate using, new technology platforms, what kind of new technology platforms were being used, and identified motivation factors for their use. The results show that the participants were actively using NTPs rather than anticipating using them. They also indicate that certified child life specialists use and view the use of NTPs similarly for preoperative preparation and distraction though the use of NTPs for distraction is slightly more prevalent.

The results for preoperative preparation indicate that while certified child life specialists are satisfied with the use of new technology platforms, use them as often as they can, need fewer resources to use them, and can provide individualization in their approach, they are not given priority, not necessarily more effective, or viewed as more effective, or used as a replacement for traditional methods of preoperative preparation. The results for NTP use for distraction interventions were slightly different; thematic analysis of open-ended response questions revealed that participants do not use NTPs as often as possible and do not give priority to using them other methods for distraction interventions for several reasons: 1) children are desensitized to NTPs due to their prevalence in society and daily life thus making tangible alternate focus items (e.g. I

Spy™, Hoberman Sphere®, glitter wand) more novel and preferable tools, 2) NTPs are not appropriate for every child and every situation (e.g. infants, specific developmental delays or diagnoses), and 3) NTPs are seen as an additional tool and not a replacement tool.

The results for motivation behind NTP use by CCLS showed a patient-centered view on NTP application. CCLS indicated their primary motivations for implementing NTPs as improving patient engagement, the patient experience, increasing knowledge, and reducing perioperative anxiety. The options that were selected less-frequently centered around reducing preparation, procedure, and recovery time, increasing flexibility, and reducing the need for additional resources—these options all reflect a productivity and hospital-focused point of view. From the perspective of child life specialists, motivation for NTP use should be based on whether or not it is best for the patient, rather than if it is better for productivity.

5.2 Research Question 2

Research question 2 answered how certified child life specialists' perceptions, beliefs, and attitudes toward new technology platforms being introduced and used as methods for preoperative preparation and distraction interventions. Though NTPs were being used and seen as effective and helpful tools, CCLS did not necessarily perceive them as more effective than traditional preoperative preparation and distraction tools and did not report that they give NTPs priority over previously used tools. While CCLS believed that NTPs were effective in enhancing patient learning and coping skills, reducing anxiety, presenting life-like learning experiences, and helping patient understand abstract content, they did not believe that NTPs were appropriate for all

patients, reduced the need for their involvement in preoperative preparation and distraction interventions, or should be used by those outside of child life to conduct such interventions. Above all, CCLS believed that their role was essential when using NTPs for preoperative preparation and distraction interventions. There was a general sense of fear and hesitation towards the use of NTPs due to the belief that those outside of child life could view such tools as a replacement for the CCLS role and that presence of NTPs would create a misconception that the CCLS role (i.e. developmental/psychosocial assessment, relationship, coping support, education) was not necessary.

One bit of controversy identified in the literature was whether or not the purpose of technology is to compensate for limited staffing/substitute for staff interventions versus supplement and enhance child life interventions (Chartrand et al, 2011; Liguori et al. 2017; Wright et al., 2017). The results of this study defend the argument that NTPs are not to be used as a replacement for child life specialist support; they are to be used by a CCLS to improve the support they provide. The CCLS perspective appears to be that the use of NTPs without CCLS support could be detrimental to a child's coping and development.

An interesting contradiction appeared in the response for "NTPs empower/will empower staff outside of child life to conduct distraction interventions" and "NTPs should be used by staff outside of child life to conduct distraction interventions." Twenty-eight out of 66 participants (42.4%) *somewhat agreed* that NTPs empower or will empower staff outside of child life to conduct distraction interventions where as 68% of participants believe that staff outside of child life should not use NTPs to conduct distraction interventions. This implies that child life specialists feel that healthcare

professionals outside of child life should not conduct distraction interventions but NTPs will empower them to do so. This implication is reinforced by the 42 participants (63.6%) that *strongly agree* and 14 (21.2%) participants that *somewhat agree* that the role of the child life specialist is essential when using NTPs for distraction interventions. This finding is in agreement with that of Burns-Nader et al. (2017).

There is a generally positive attitude towards the use of NTPs in preoperative preparation. Based on the similarities between participant responses for the usage of NTPs for preoperative preparation versus distraction and beliefs about the usage of NTPs for preoperative preparation versus distraction it is the researchers belief that the conclusion can be drawn that attitudes towards the use of NTPs in distraction interventions would be similar to those of the attitudes indication towards the use of NTPs for preoperative preparation.

An area for growth was identified in that 18.8% of participants felt that administration was uninvolved and practiced “blind acceptance” of new technology platforms; this may be related to the minimal 13% of participants that felt the administrative attitude towards the implementation of new technology platforms was research based. One participant commented, “Our administration has been very supportive of using new technology platforms. The administration often sees this as a publicity and fundraising opportunity.” These results suggest that new technology platforms are supported for their novelty and not because their use is research based.

5.3 Research Question 3

The results for research question three emphasized that certified child life specialists view NTPs as a complement to their current efforts to reduce perioperative

anxiety and feel they have the potential to improve the efforts with implemented with care (i.e. assessment of the child). Piaget's cognitive development theory suggested that there is a developmentally appropriate way to educate a child based on their current developmental stage (Capurso & Ragni, 2016; Rasnake & Linscheid, 1989). Participants felt that NTPs were not developmentally appropriate for all patients and several participants felt that the use of NTPs weren't appropriate because "as a society, the amount of screen time used with children is very detrimental to proper development, communication skills, empathy, and attention span." A number of participants believed that traditional methods (i.e., tangible objects, photos) were more beneficial because they offered no detriment to development. Participants revealed their feelings of responsibility for adapting to a more technology rich culture while also continuing to provide the most developmentally appropriate and responsible care for hospitalized children.

Participants believed NTPs enhanced or had potential to enhance patients' coping skills and reduced or had potential to reduce stress and anxiety for patients in the perioperative period; this supported stress and coping theory. NTPs are familiar to pediatric patients and therefore provide a comforting, relatable stimulus that CCLS can introduce to facilitate distraction and/or preparation. Participants emphasized their belief that NTPs are just one more tool that has been added to their toolbox for preoperative preparation and distraction interventions (i.e., reducing stress and enhancing coping). It was implied that losing sight of this could lead to improper implementation and use of NTPs and outside perception of the role and importance of the CCLS.

5.4 Research Question 4

Research question four a general since of NTPs having a positive effect on the role of the CCLS. Participants believed that NTPs captured children's attention and provided accurate models of hospital experiences. This supported social learning theory in that NTPs provided observational and interactive learning experiences during preoperative preparation and with CCLS guidance, could help children retain, imitate, and reinforced their understanding of hospital experiences both before and after they occurred. One CCLS commented, "*NTPs are simply a new platform to do things [child life] has been doing for years (preparation books w/ photographs are now on Keynote app, videos of areas are now available on tablets instead of VCR or DVD, etc).*" NTPs offer an up-to-date approach that is familiar to children and accessible to CCLSs while also continuing to provide accurate behavioral models.

A negative effect participants expressed that relates to the literature is that of the perceived threat NTPs pose on therapeutic relationships. While several participants believed that the familiarity of NTPs helped with rapport building, many felt that NTPs posed a threat to the patient-CCLS relationship because of the perceptions other medical professionals have about the use of NTPs. Therapeutic relationships are based on establishing trust which requires CCLS presence, involvement, and assessment. Participant's felt NTPs posed a threat to their opportunity to establish trusting relationships with patients because their skills and involvement may be reduced by NTPs being present in the pediatric setting. Participants also felt that some CCLS may implement NTPs improperly by using them to replace their skills and other beneficial

tools for preparation and distraction. Proper education and implementation is needed in order to reduce the threats posed by NTPs and maximize their benefit.

5.5 Implications and Recommendations

Implications for research. Due to this being the first known study on the perceptions of CCLS on the use of NTPs, there is little research with which to compare the results. The findings, however, can be connected to several studies previously mentioned in this study. The first of these connections is the lack of child life involvement in the development of NTPs for hospital use. Nine studies on NTPs were referenced in this study; four do not mention child life in development or implementation, four reported that a CCLS was on the research team and/or involved in application development, and two involved a CCLS in the study intervention. A participant in this study commented:

Only issue is - child life was not involved in any part of the development or design of the research study, which is led by [the] anesthesia [department]. Now anesthesia wants child life [specialists] to be the ones to oversee the use of the mask and tablet - so it is turning into the example I listed on the previous set of questions. No one values child life [specialists] until they need someone to hand out a game.

This implies that CCLS feel they need to be more involved in NTP application development for pediatric patients. An argument that can be added to this is the essential role played by the CCLS in the implementation and use of NTPs. Burns-Nader et al. (2017) aimed to specifically study “the effectiveness of a computer tablet distraction provided by child life specialists for decreasing pain and anxiety in pediatric burn

patients undergoing hydrotherapy (p. 1204).” The study results emphasized the importance of the CCLS role in implementing tablet-based distraction. The study included psychosocial support for patients both with and without the tablet-based distraction but did not include tablet-based distraction sans CCLS support. Future research must be conducted to benchmark the effectiveness of an NTP plus CCLS support versus the NTP on its own. This research would help support the argument of the CCLS being essential in the implementation of NTPs and involvement in creating an NTP best practices guide for use with pediatric patients. The participants in this study felt there was a lack of research-based NTP implementation on the part of their administration. Increasing child life involvement in the research, development, and implementation of NTPs may help contribute to a research-based administrative attitude. If the CCLS role is critical in the implementation of NTPs, it is therefore also critical in the design of NTPs that are intended for supporting the coping of pediatric patients?

The results of the present study with regards to whether or not NTPs were viewed as more effective resulted in a “neither agree nor disagree” consensus meaning there is not an obvious or dramatic shift in the observable results of interventions using NTPs. While the effectiveness may not offer an openly observable difference to all CCLS, several participants noted their observations on improved engagement, compliance, anxiety, and coping. Future research on the success of specific NTPs in comparison with traditional methods is needed to determine if NTPs are in fact more effective and worth implementing. Chow, Van Lieshout, Schmidt, and Buckley (2017), studied the effects of a tablet-based preoperative preparation application called “Story Telling Medicine.” In

their study, the effects of their usual care method, which included preparation and support by a child life specialist was compared to the use of the “Story Telling Medicine” application plus their usual care method. The tablet-based application was available to children and families to use at home prior to surgery and on the day of surgery. The results of this study showed a significant difference in anxiety reduction for the patients that received the tablet-based intervention plus usual care when compared to those with only usual care. In this case, NTPs plus child life support was more effective than only child life support; the effectiveness of the NTP on its own was not studied. Based on the results of the present study, more studies like that of Chow et al. (2017) are advised.

Implications for practice. An overwhelming theme presented by this study is the CCLS belief that NTPs are not appropriate for all children. With this, it is implied that child life departments need to work in conjunction with the American Academy of Pediatrics, other hospital staff, and NTP developers to create standards of use. This would require studies on NTPs based on age, medical experience, diagnosis, and setting. Additionally, it would require the creation of a comprehensive list of NTPs that are being used along with their intended use. Knowledge must be gained on all types of NTPs that are being used in order to more clearly define NTPs, categorize them, and create developmental standards and guidelines for use in a pediatric setting.

As previously mentioned, NAEYC (2012) asserts that technology and media can be used to support learning and relationships; this is contingent upon the technology being used “wisely.” CCLS are seen as experts in child development and therefore have the knowledge and skills to define “wise” use of NTPs with hospitalized children. A

study by Arora, Soares, Li, and Zimmerman (2016) on screen media use in hospitalized children determined

that hospitalized children are engaged in screen use for more hours than recommended for healthy development, and that caregivers have concerns about the quantity of hospital screen use. Pediatricians and children's hospitals should consider developing guidelines for screen use in the hospital and make available other diversionary activities to improve quality of life for hospitalized children.

(p. 303)

The study also mentioned that the American Academy of Pediatrics recommends, "limiting total non-educational screen media use to no more than 2 hours per day (p. 298)." The study did not differentiate between educational and non-educational use of screen media and participants were not asked to specify the reason for screen media use (i.e., illness severity, boredom, anxiety, or lack of other diversionary activities). Several participants in the present study expressed concern about the amount of screen time children are exposed to in today's society; they felt that introducing a screen for preparation or distraction was unnecessary and inappropriate due to the number of alternative options that are available. One participant commented,

I hope our field continues to teach, model and encourage the use of play, relationships and creative and engaging interventions to aid in preparation and coping. Leave technology for children to do on their own for their own distraction. When a CCLS is available to them, we should not be putting another screen in front of their face.

This participant also referenced the AAP (2016) recommendations for screen use which recommend no screen time for children under the age of 18 to 24 months, only high-quality media use with parental guidance for children 18 to 24 months, and 1-hour per day of screen use for children 2 to 5 years old. Participants felt it was their responsibility to contribute the most developmentally appropriate option for preparation and distraction—based on screen time recommendations and the amount of screen time patients are exposed to in a hospital setting, it is within the CCLS’s control to use tools other than NTPS for preparation and distraction.

5.6 Limitations

There were several limitations for this study. Electronic surveys have the potential to limit or bias responses due to concerns about confidentiality (McMillan, 2016). The researcher addressed this by providing a statement of confidentiality and anonymity in the introduction of the survey; in the consent portion of the survey participants acknowledged their understanding by selecting “I agree.” Another source of potential bias came from using a volunteer based sample; participants that volunteer may be more motivated or involved in the research topic and are typically seen as higher achieving than those who chose not to volunteer (McMillan, 2016). Provision of an inclusion statement in the recruitment post/email addressed this limitation; all who met the inclusion criteria and had the potential to encounter new technology platforms in their role were encouraged to participate. (Seeing as the majority of participants were currently using NTPs, rather than anticipating using or not anticipating using, it is possible that only those interested in using NTPs volunteer to complete the survey.) Next, the use of the ACLP general forum is a potential limitation; saturation and overuse limited the

number of CCLS who saw the notification and/or were willing to participate. Reaching out to directors of child life programs in four states in the Southeast as well as professional contacts of the researcher and the researcher's committee addressed this concern by broadening the exposure potential of the survey. Looking at the larger picture of the use of technology by certified child life specialists for preoperative preparation and distraction interventions, it is important to understand two things: 1) that the new technology platforms being using may not have been designed with child development and child life practices in mind, and 2) that research on the outcomes of using such tools is not necessarily being conducted by certified child life specialists. This limitation could have effected the perception of child life specialists about the usefulness and effectiveness of new technology platforms and has potential to guide future research, as research by certified child life specialists is a growing area of research. One participant mentioned this specifically challenge specifically stating, "Only issue is - child life was not involved in any part of the development or design of the research study, which is led by anesthesia. Now anesthesia wants child life to be the ones to oversee the use of the mask and tablet." This could limit the perspective of CCLS on the use and perceived effectiveness of NTPs. Finally, the results of the study have limited generalizability due to the distribution of participants across states and age groups. The majority of the participants came from two Southeastern states (i.e., North Carolina and Georgia) and participants under the age of 40.

5.7 Conclusion

The theoretical background of the study was based on Piaget's cognitive development theory, information processing theory, social learning theory, stress and

coping theory, and psychosocial development and therapeutic relationship theories.

Piaget's theory along with information processing theory was supported through CCLS's belief that NTPs are not appropriate for every child; assessment of the child's developmental level, diagnosis, and previous experiences by the CCLS was viewed as irreplaceable. This goes back to Eiser and Patterson's (1984) findings that supported the argument that any information provided to hospitalized children should be catered to the child's individual needs and interests. Callery and Smith's (2005) perspective stated that understanding a child's preexisting knowledge and experience (i.e., determining their scripts about hospitalization) is critical providing appropriate interventions. The use of NTPs is no exception these arguments; a CCLS must use their knowledge of cognitive development and information processing theory to determine if NTPs are the most developmentally appropriate approach to intervention.

There is a significant amount of information that needs to be gained about the effectiveness of using NTPs with pediatric patients for preoperative preparation and distraction interventions. The present study revealed NTP use and favorability despite the lack of an evidence base for their effectiveness. CCLS believe when used in a developmentally appropriate manner, NTPs are a positive addition to the existing repertoire of tools that can be used for preoperative preparation and distraction interventions. The foundational child life principal that every child is unique stands paramount in the consideration for the use of NTPs in a hospital setting—when deemed appropriate by a CCLS, and with CCLS guidance, NTPs can aid in the reduction of anxiety and improvement of coping for pediatric patients.

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APPENDIX A: TABLES

TABLE 1: PARTICIPANT DEMOGRAPHICS

	<i>n</i>	%
Gender		
Female	68	98.6
Male	1	1.4
Age		
20-25	11	15.9
26-30	23	33.3
31-35	13	18.8
36-40	13	18.8
41-45	1	1.4
46-50	3	4.3
51-55	2	2.9
56-60	3	4.3
Race/Ethnicity		
White	62	89.9
Asian	1	1.4
Hispanic or Latino	3	4.3
Prefer not to share	3	4.3
Level of education		
Bachelors Degree	38	55.1
Masters Degree	31	44.9
Years of experience		
0-3	22	31.9
4-7	18	26.1
8-11	10	14.5
12-15	8	11.6
16-19	2	2.9
20+	9	13.0
Staff size		
Single-person	1	1.4
1 to 5	13	18.8
6 to 10	16	23.2
11 to 15	9	13.0
16 or more	29	42.0
Other	1	1.4
Work setting		
Inpatient	17	24.6
Outpatient	24	34.8
Both	28	40.6

Unit ^a		
General Pediatrics	23	NA
Medical Surgical	21	NA
Radiology	21	NA
Emergency	19	NA
Department		
Other	16	NA
Hematology/Oncology	15	NA
PICU	14	NA
NICU	8	NA
Anesthesia/PACU	7	NA
Infusion	5	NA
Progressive Care	4	NA
Rehabilitation	3	NA

^aResponses for other included neurology, cardiology, surgery, technology dependent ICU, LASER clinic/day surgery, behavioral specialty, endocrinology, orthopedics, pre-op, community, outpatient specialty care clinic, adult unit, pediatric intermediate/critical care, float/resource, PRN

TABLE 2: PARTICIPANT LOCATION BY STATE

State	<i>n</i>	%
North Carolina	18	26.1
Georgia	10	14.5
South Carolina	5	7.2
California	4	5.8
Arizona	3	4.3
Nebraska	3	4.3
Oregon	3	4.3
Tennessee	3	4.3
Texas	3	4.3
Minnesota	2	2.9
Virginia	2	2.9
Wisconsin	2	2.9
Alaska	1	1.4
Alabama	1	1.4
Florida	1	1.4
Iowa	1	1.4
Idaho	1	1.4
Illinois	1	1.4
Kentucky	1	1.4
Louisiana	1	1.4
Missouri	1	1.4
North Dakota	1	1.4
Ohio	1	1.4

TABLE 3: RESEARCH QUESTION 1

	<i>n</i>	%
How		
Currently for Preoperative Preparation	52	75.4
Currently for Distraction	65	94.2
Anticipate Using for Preoperative Preparation	10	14.5
Anticipate using for distraction	7	10.1
Do not anticipate using	0	0
What ^a		
Virtual reality (VR)	37	53.6
Tablet-based applications	69	100.0
Web-based applications	15	21.7
Other	4	5.8
Motivation ^b		
Improve patient engagement	56	81.2
Improve patient knowledge	56	81.2
Improve postoperative recovery time	14	20.3
Improve patient experience	59	85.5
Reduce perioperative anxiety	59	85.5
Reduce prep times	15	21.7
Reduce procedure times	22	31.9
Reduce need for resources	18	26.1
Increase flexibility	27	39.1
Other	4	5.8

Note. Percentages are of total number of participants (N=69).

^aResponses for other included video games (x2), view finder augmented reality (x1), and MRI movie goggles (x1). ^bResponses for other included coping (x1), reduce overall anxiety (x1), decrease use of anesthesia (x1), improve patient compliance (x1).

TABLE 4: USAGE OF NTPs IN PREOPERATIVE PREPARATION

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Missing
I try to use NTPs in preoperative preparation as often as possible	1	10	7	17	16	0
I give priority to the use of NTPs in preoperative preparation over other methods	3	12	15	11	9	1
Using NTPs requires fewer resources (i.e., time, materials, space) in order to carry out preoperative preparation	0	8	8	21	14	0
The use of NTPs in preoperative preparation is more effective than previously used methods/tools (i.e., there is observable evidence of reduced perioperative anxiety)	1	11	23	13	3	0
The use of NTPs allows me to individualize preoperative preparation for each patient	3	8	6	24	10	0
I am satisfied with the use of NTPs in preoperative preparation	0	2	4	32	13	0
The use of NTPs has replaced previous methods/tools used for preoperative preparation	4	14	8	14	11	0

TABLE 5: USAGE OF NTPs IN DISTRACTION INTERVENTIONS

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Missing
I try to use NTPs in distraction interventions as often as possible	4	13	13	26	10	0
I give priority to the use of NTPs in distraction interventions over other methods	11	16	18	12	8	1
Using NTPs requires fewer resources (i.e., time, materials, space) in order to carry out distraction interventions	3	6	10	33	14	0
The use of NTPs in distraction interventions is more effective than previously used interventions (i.e., there is observable evidence of reduced perioperative anxiety)	3	12	29	15	7	0
The use of NTPs allows me to individualize distraction interventions for each patient	1	3	4	42	15	1
I am satisfied with the use of NTPs in distraction interventions	1	3	6	33	23	0
The use of NTPs has replaced previous methods/tools used for distraction interventions	9	18	15	18	6	0

TABLE 6: BELIEFS, PREOPERATIVE PREPARATION

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Missing
NTPs enhance/will enhance patients' learning in the preoperative preparation	0	1	3	32	24	0
The use of NTPs enhances/will enhance patients' coping skills	0	2	12	31	15	0
NTPs help/will help reduce stress and anxiety for patients in the perioperative period	0	0	4	34	22	0
NTPs present/will present patients with important life-like learning experiences	1	6	11	24	18	0
NTPs are powerful tools that help/will help patients understand abstract content	1	4	12	24	19	0
All patients should be considered for preoperative preparation using new	5	18	11	18	7	1

technology platforms						
NTPs reduce/will reduce the need for my involvement in preoperative preparation	49	10	1	0	0	0
NTPs empower/will empower staff outside of child life to conduct preoperative preparation	17	21	10	11	1	0
NTPs should be used by staff outside of child life to conduct preoperative preparation	22	21	11	5	0	1
The role of the child life specialist is essential when using NTPs for preoperative preparation	0	4	3	13	39	1

TABLE 7: BELIEFS, DISTRACTION INTERVENTIONS

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Missing
The use of NTPs enhances/will enhance patients' coping skills	0	1	10	32	23	0
NTPs help/will help reduce stress and anxiety for patients in the perioperative period	0	1	4	34	25	2
All patients should be considered for distraction interventions using new technology platforms	11	15	15	14	10	1
NTPs reduce/will reduce the need for my involvement in distraction interventions	40	19	2	5	0	0
NTPs empower/will empower staff outside of child life to conduct distraction interventions	16	16	5	28	1	0
NTPs should be used by staff outside of child life to conduct distraction interventions	22	23	9	10	2	0
The role of the child life specialist is essential when using NTPs for distraction	2	4	4	14	42	0

TABLE 8: ATTITUDES, PREOPERATIVE PREPARATION

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	Missing
Adds value	0	1	4	26	28	0
Is important	0	4	7	26	22	0
Makes/will make the process more interesting	0	2	3	29	24	1
Makes/will make patients more motivated	0	5	11	28	15	0
Makes/will make the content more functional and accessible	1	1	2	25	28	2
Helps/will help children understand abstract concepts	1	4	11	26	17	0
Is something I want to do	0	1	8	26	23	1
Is/will be enjoyable for me	1	1	13	21	22	1
Is/will be enjoyable for patients	0	1	3	27	27	1
Allows/will allow me to do my job effectively	1	2	9	33	14	0
Has the flexibility I need/will need to do my job	0	2	13	25	18	1
Is something I feel/felt prepared to do	2	1	4	28	23	1
Is a bad idea	29	21	5	1	3	0
Is intimidating to me	31	22	2	3	1	0
Is/may be frustrating at times	11	5	11	26	5	1

APPENDIX B: ACLP FORUM RECRUITMENT POST

Hi Everyone!

I am a graduate student at The University of North Carolina at Charlotte. I am in the process of completing my master's thesis, under the supervision of my faculty advisor Dr. JaneDiane Smith, and I need your help! The purpose of my research is to gather the perspective of certified child life specialists on the use of new technology platforms (i.e., virtual reality, tablet-based applications, video games, computer or internet-based programs) for preoperative preparation and distraction interventions. If you are currently certified as a child life specialist and work in the United States in a role that offers preoperative and/or procedural preparation (inpatient or outpatient) and/or distraction interventions, then I want to hear from you! Current use of new technology platforms is not required.

If you would like to participate, the link to the survey is below:

<http://uncc.surveymshare.com/t/CCLSPerceptionsofNewTechnologyPlatforms>

The survey will take approximately 15 minutes to complete. If you are not able to finish the survey in one sitting, you may save and close the survey and come back to it at your convenience. The survey has mobile compatibility if you prefer to complete it on your phone rather than your computer.

Please know that your participation is completely voluntary. If you chose to begin the survey and then decide you do not want to participate, you may stop at any time.

For more details on the research study, consent information, and research team contact information, please view the document attached to this post.

Your opinions are important! Thank you in advance for your time.

Sincerely,
Courtney Osborne

APPENDIX C: RECRUITMENT EMAIL TO PROGRAM DIRECTORS

To Whom It May Concern:

I am a graduate student at The University of North Carolina at Charlotte. I am in the process of completing my master's thesis, under the supervision of my faculty advisor Dr. JaneDiane Smith, and I need your help! In an effort to increase exposure to and participation in my study, I have chosen to contact child life program coordinators and directors in four states in the Southeast. I located your contact information using the ACLP program directory. It is my hope that you will pass this email along to your staff so that, if they are interested, they may participate in my study.

The purpose of my research is to gather the perspective of certified child life specialists on the use of new technology platforms (i.e., virtual reality, tablet-based applications, video games, computer or internet-based programs) for preoperative preparation and distraction interventions. If you are currently certified as a child life specialist and work in the United States in a role that offers preoperative and/or procedural preparation (inpatient or outpatient) and/or distraction interventions, then I want to hear from you! Current use of new technology platforms is not required.

If you would like to participate, the link to the survey is below:

<http://uncc.surveymshare.com/t/CCLSPerceptionsofNewTechnologyPlatforms>

The survey will take approximately 15 minutes to complete. If you are not able to finish the survey in one sitting, you may save and close the survey and come back to it at your convenience. The survey has mobile compatibility if you prefer to complete it on your phone rather than your computer.

The survey is also posted on the ACLP General Forum. If you subscribe to and follow the forum, please only complete the survey once! You may choose to follow the link in this email or in the forum.

Please know that your participation is completely voluntary. If you chose to begin the survey and then decide you do not want to participate, you may stop at any time.

For more details on the research study, consent information, and research team contact information, please view the document attached to this email.

Your opinions are important! Thank you in advance for your time.

Sincerely,
Courtney Osborne

APPENDIX D: PROSPECTIVE PARTICIPANT FLYER

To whom it may concern,

My name is Courtney Osborne and I am currently working towards a Master's in Child and Family Studies from the University of North Carolina at Charlotte. I am seeking the support of certified child life specialists to complete my master's thesis, which is being done under the supervision of my faculty advisor Dr. JaneDiane Smith. The purpose of this study is to gain the perspective of child life specialists on their use, or anticipated use, of new technology platforms (i.e., computer or web-based platforms, tablet-based applications, virtual reality) in preoperative preparation and distraction. As the experts in preoperative preparation and distraction, your feelings, attitudes, and beliefs about the implementation of new technology platforms are extremely valuable. If you hold current certification as a child life specialist, work in the United States, and serve in a role that offers preoperative and/or procedural preparation (inpatient or outpatient) and/or distraction interventions, please consider participating in my study. I encourage everyone that meets the criteria above to participate—in-depth knowledge, experience, and a favorable opinion of the use of technology in preoperative preparation and distraction is not required. You do not have to be currently performing preoperative and/or procedural preparation and/or distraction interventions with new technology platforms to participate.

If you choose to participate, the only requirement is the completion of a survey. The survey should take approximately 15 minutes to complete. Once you complete the survey, that's it! You are finished! Your participation in the study is voluntary and confidential; it will not require you to share any personally identifying information. There are no foreseeable risks for your involvement in this study. The benefits, however, include introducing the voice of child life specialists into a growing body of research on using new technology platforms with hospitalized children and to inform future development and implementation of such technologies. The purpose of the survey is for you to share your usage, feelings, attitudes, and beliefs about the implementation of new technology platforms in preoperative preparation and distraction in order to guide future development and implementation of such tools. Your perspective is important!

Thank you in advance for you time and participation! Please contact me or Dr. JaneDiane Smith, my faculty advisor and committee chair, if you have any questions or concerns, or you may contact the UNC Charlotte Compliance Office, 704-687-1871 or uncc-irb@uncc.edu. Please click on the link below to complete the survey, or follow the link provided in the ACLP forum post.

Sincerely,
Courtney Osborne
Candidate for Master's of Education Child and Family Studies
UNC Charlotte
cnorri15@uncc.edu

Dr. JaneDiane Smith, Ph.D.
Associate Professor, UNC Charlotte
Special Education & Child Development
jdianesm@uncc.edu

APPENDIX E: SURVEY

Perceptions towards the use of new technology platforms in preoperative preparation and distraction

Introduction:

Recent literature indicates that new technology platforms are being developed and introduced for child life specialists to use in preoperative preparation and distraction interventions. New technology platforms (NTPs) include things like virtual reality, tablet-based applications, and computer or web-based platforms. The purpose of this survey is to gather the perceptions of certified child life specialists towards the use of new technology platforms in preoperative preparation and distraction interventions. The collective voice of Certified Child Life Specialists on the implementation and use of new technology platforms in the field is vital to understanding the utility and effectiveness these interventions.

For the purposes of this survey, the term *preoperative* includes preparations for surgery **AND** procedures that may happen with or without anesthesia and in an inpatient or outpatient setting.

If for any reason you cannot complete the survey all at once, you may stop, save, and return to the survey at your convenience. The survey is compatible with mobile devices if you would prefer to take it using your phone rather than a computer.

Your participation in this survey is voluntary and you may stop participating at any time. Your responses will be confidential and anonymous. You will be able to give or deny consent to complete this survey on the next page.

Please use the red arrow(s) at the bottom of the screen to move between pages

I understand that my participation is voluntary. I understand that the responses I provide will be confidential and anonymous and I will answer openly and truthfully.

By selecting "I agree," you will be agreeing to the above statement and giving consent to complete the survey:

- I agree
 - I disagree
-

Are you currently certified as a child life specialist?

Yes

No

Are you currently working within the United States?

Yes

No

What is your age?

20-25

26-30

31-35

36-40

41-45

46-50

51-55

56-60

61-65

65+

To which race/ethnicity do you most identify?

- White
- Black or African American
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Hispanic or Latino
- Not Listed _____
- Prefer not to share

To which gender identity do you most identify?

- Male
- Female
- Transgender Female
- Transgender Male
- Gender Variant/Non-Conforming
- Not Listed _____
- Prefer not to share

How many years have you worked as a certified child life specialist?

- 0-3
- 4-7
- 8-11
- 12-15
- 16-19
- 20 +

In which unit/setting do you **currently** practice? (Please check all that apply)

Emergency Department

NICU

PICU

Anesthesia/PACU

Medical/Surgical Units

Progressive Care

Rehabilitation

Hematology/Oncology

Radiology

Infusion

Other _____

Do you work in an inpatient or outpatient setting?

- Inpatient
- Outpatient
- Both

What is the size of your **current** department?

- Single-person program
- Staff of 1 to 5
- Staff of 6 to 10
- Staff of 11 to 15
- Staff of 16 or more

What is the highest level of education you have completed?

- Bachelors Degree
- Masters Degree
- Ph.D
- Other _____

In which US state do you **currently** work?

Which of the following describes your usage of new technology platforms (NTPs)?
(Please check all that apply)

- I currently use NTPs for preoperative preparation
- I currently use NTPs for distraction
- I anticipate using NTPs for preoperative preparation
- I anticipate using NTPs for distraction
- I do not anticipate using NTPs for preoperative preparation or distraction
- None of the above

Please briefly describe why you do not anticipate using new technology platforms for preoperative and/or procedure preparation or distraction.

You feel that none of the previous answer choices describe your usage of NTPs. In your own words, please briefly describe how you use NTPs:

Which of the following NTPs are you currently using or do you anticipate using?
(Please check all that apply)

- Virtual Reality
 - Tablet-based applications
 - Computer/Web-based platforms
 - Other (Please describe)
-

Whether you are currently using NTPs or anticipate using them, what was/is the
motivation behind their implementation? (Please check all that apply)

- Improve patient engagement
- Improve patient knowledge
- Improve postoperative recovery times
- Improve patient experience
- Reduce perioperative anxiety
- Reduce prep times
- Reduce procedure times
- Reduce need for resources (i.e., access to empty OR or procedure space for a tour)
- Increase flexibility
- Other _____

Identify the administrative attitude towards the use of NTPs.

- Blind acceptance
 - Research based
 - Supportive
 - Resistant
 - Uninvolved
-

The following questions pertain to your use of NTPs in **preoperative preparation**.

If you are not **currently** using NTPs for **preoperative preparation**, please check the box labeled "not applicable" and you will be directed to the next portion of the survey.

Not applicable

Rate your **usage** of new technology platforms in **preoperative preparation**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I try to use NTPs in preoperative preparation as often as possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give priority to the use of NTPs in preoperative preparation over other methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using NTPs requires fewer resources (i.e., time, materials, space) in order to carry out preoperative preparation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of NTPs in preoperative preparation is more effective than previously used methods/tools (i.e., there is observable evidence of reduced	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

perioperative anxiety)					
The use of NTP allows me to individualize preoperative preparation for each patient	<input type="radio"/>				
I am satisfied with the use of NTPs in preoperative preparation	<input type="radio"/>				
The use of NTPs has replaced previous methods/tools used for preoperative preparation	<input type="radio"/>				

The following questions pertain to your use of NTPs in **distraction interventions**.

If you are not **currently** using NTPs for **distraction interventions**, please check the box labeled "not applicable" and you will be directed to the next portion of the survey.

Not applicable

Rate your **usage** of new technology platforms for distraction interventions

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I try to use NTPs in distraction interventions as often as possible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I give priority to the use of NTPs in distraction interventions over other methods	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Using NTPs requires fewer resources (i.e., time, materials, space) in order to carry out distraction interventions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of NTPs in distraction interventions is more effective than previously used interventions (i.e., there is observable evidence of reduced preoperative anxiety)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of NTPs allows me to individualize distraction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

interventions
for each
patient

I am satisfied
with the use of
NTPs in
distraction
interventions

The use of
NTPs has
replaced
previous
methods/tools
used for
distraction
interventions

If you are currently using or anticipate using NTPs for **preoperative preparation**, please answer the following questions.

If you are **not currently using or anticipating using** NTPs for preoperative preparation, please check the box labeled "not applicable" and you will be directed to the next portion of the survey.

Not applicable

The following questions pertain to your **beliefs** about the use of new technology platforms in preoperative preparation.

I believe...

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
NTPs enhance/will enhance patients' learning in the preoperative preparation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The use of NTPs enhances/will enhance patients' coping skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NTPs help/will help reduce stress and anxiety for patients in the perioperative period	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NTPs present/will present patients with important life-like learning experiences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NTPs are powerful tools that help/will help patients understand abstract content

All patients should be considered for preoperative preparation using new technology platforms

NTPs enhance/will enhance the preoperative preparation services I provide

NTPs should be used as a complement, or addition, to the preoperative preparation services I already provide

NTPs should be use in leu of current practices for preoperative preparation

NTPs reduce/will reduce the need for my involvement in preoperative preparation

NTPs empower/will empower staff outside of child life to conduct preoperative preparation	<input type="radio"/>				
NTPs should be used by staff outside of child life to conduct preoperative preparation	<input type="radio"/>				
The role of the child life specialist is essential when using NTPs for preoperative preparation	<input type="radio"/>				

If you are currently using or anticipate using NTPs for **distraction interventions**, please answer the following questions.

If you are not currently using or anticipating using NTPs for **distraction interventions**, please check the box labeled "not applicable" and you will be directed to the next portion of the survey.

Not applicable

The following questions pertain to your **beliefs** about the use of new technology platforms in **distraction interventions**.

I believe...

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The use of NTPs enhances/will enhance patients' coping skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NTPs help/will help reduce stress and anxiety for patients in the perioperative period	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
All patients should be considered for distraction interventions using new technology platforms	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NTPs enhance/will enhance the distraction services I provide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NTPs should be used as a complement, or addition, to the distraction services I already provide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NTPs should be use in leu of current practices for distraction interventions

NTPs reduce/will reduce the need for my involvement in distraction interventions

NTPs empower/will empower staff outside of child life to conduct distraction interventions

NTPs should be used by staff outside of child life to conduct distraction interventions

The role of the child life specialist is essential when using NTPs for distraction

If you are currently using or anticipate using NTPs for **preoperative preparation**, please answer the following questions.

If you are **not currently using or anticipating using** NTPs for **preoperative preparation**, please check the box labeled "not applicable" and you will be directed to the next portion of the survey.

Not applicable

The following questions pertain to your **attitudes** towards the use of new technology platforms in preoperative preparation.

The use of NTPs in **preoperative preparation**...

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Adds value	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is important	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Makes/will make the process more interesting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Makes/will make patients more motivated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Makes/will make the content more functional and accessible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Helps/will help children understand abstract concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is something I want to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Is/will be enjoyable for me	<input type="radio"/>				
Is/will be enjoyable for patients	<input type="radio"/>				
Is/will be more enjoyable for patients than other methods/tools	<input type="radio"/>				
Allows/will allow me to do my job effectively	<input type="radio"/>				
Has the flexibility I need/will need to do my job	<input type="radio"/>				
Is something I feel/felt prepared to do	<input type="radio"/>				
Is a bad idea	<input type="radio"/>				
Is intimidating to me	<input type="radio"/>				
Is/may be frustrating at times	<input type="radio"/>				

To what extent do you feel the implementation of NTPs has had or will have a positive or negative effect on the role of the child life specialist?

- Extremely positive
- Moderately positive
- Slightly positive
- Neither positive nor negative
- Slightly negative
- Moderately negative
- Extremely negative

Please briefly explain your reasoning behind the above response.

If there is anything you feel you haven't been able expressed through this survey, please feel free to express it here. Any and all thoughts not clearly described through the questions above are welcome.
