FUTURE HEALTH CARE PROFESSIONALS' KNOWLEDGE OF DEVELOPMENTALLY APPROPRIATE CARE WITH CHILDREN IN THE HEALTH CARE SETTING

By

JESSICA NICOLE WENTE

A THESIS PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE

UNIVERSITY OF FLORIDA

2011

To children: may this research contribute to a better health care experience for you and your families.

ACKNOWLEDGMENTS

I would like to take the opportunity to thank everyone who has contributed to my success as a graduate student. I thank my family for their dedication to my education, as none of this would be possible without their love and support. My parents have always taught me to follow my passion, and I have done just that. Additionally, my family has taught me a few life skills that have helped over the last few years. My mother exemplifies optimism and resilience, and my father and step-mother have taught me patience, a good sense of humor, and to pick my battles in life. My Grandpa Burger has taught me the value of a good education and to never take myself too seriously, and my Grandma Donna has taught me the value of family and faith (and good chocolate pie!). I thank you all for your dedication to my education and who I am as a person. I am so blessed that you were the “village” who raised me.

I thank my committee for allowing me to pursue a research topic that I am truly passionate about. It made my thesis work exciting and meaningful. I am also thankful for my committee’s patient guidance on best practices for research. I thank my committee chair, David Diehl, for going above and beyond as a mentor to make sure I never settle for less than my best work. I am appreciative of this investment in my development as a graduate student and as a young professional. Last but certainly not least, I would like to thank my friends who have helped me celebrate milestones, accomplishments and have simply made life enjoyable. I cherish you and am thankful for the opportunities you provide daily to laugh and to remember what is important in life.

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Jessica Nicole Wente

August 2011

Chair: David Diehl
Major: Family, Youth and Community Sciences

Children experience significant anxiety and distress during procedures and other experiences in the health care setting (Brady, Avner, & Khine, 2011; Chorney & Kain, 2009; Hamilton, 1995; Kain, Mayes, O'Connor, & Cicchetti, 1996; MacLaren & Kain, 2009). Without intervention, this can interfere with children's normal development (Child Life Council, 2008; Chorney & Kain, 2009; R. H. Thompson & Snow, 2009). Children want to know what they will experience in the health care setting (Fortier et al., 2009; Smith & Callery, 2005), and children have the right to be prepared for their health care experience and to have their desires, needs, and emotions considered (United Nations, 1989). It is the health care professionals' ethical responsibility to provide appropriate psychosocial care (Kuttner, 2010). This research evaluates future health care professionals' knowledge of developmentally appropriate care (DAC) with children in the health care setting. Participants include nursing, medical, physician assistant, physical therapy, and non-clinical health care students. The instrument utilizes subscales that measure knowledge of DAC, confidence in providing DAC, and interest in future training on DAC, which are informed by the Child Life Council's child life professional

certification exam and the *Child Life Internship Program Self-Review*. Knowledge of DAC significantly varied by field of study, with non-clinical health care professionals scoring significantly lower on the knowledge of DAC scale than other fields of study. Students who intend to work with children in their profession had the same level of knowledge of DAC as students who indicate that they do not plan to work with children. Patient-centered views significantly predict knowledge of DAC with children in the health care setting. As age increases, knowledge of DAC also increases for nursing and physical therapy students. However, personal and professional experience does not significantly predict knowledge of DAC within any of the fields of study. For non-clinical health care students, a course in child development significantly predicts more knowledge of DAC. Interest in future training on DAC varies significantly between the observed fields of study, with physician assistant students being the most interested. Students who intend to work with children in their profession indicate significantly more interest than students who indicate that they do not plan to work with children. Across all fields of study, students who are younger, more confident in their ability to provide DAC, had more personal and professional experience with children, had taken a course in child development, and who are more patient-centered are more interested in future training on DAC with children in the health care setting.

CHAPTER 1
INTRODUCTION

The Health Care Experience from a Child's Perspective

The U.S. Department of Health and Human Services (2010) reported that in 2009, 91.5% of children had contact with a health care professional. The study also found that more than 9.5 million children in the United States were on prescription medication for at least three months due to a health problem, and about 14 million children between the ages of 5-17 years missed school because of an illness or injury (U.S. Department of Health and Human Services, 2010). Further, three-quarters of all children reported having interaction with their doctor or another health care professional in the previous 6 months (U.S. Department of Health and Human Services, 2010) and for emergency care, 10.4 million children had visited an emergency room in the past 12 months, and 5 million children had two or more visits to the emergency room as of 2009 (U.S. Department of Health and Human Services, 2010).

Without question, most children in the United States will interact with the health care setting. For example, if recommendations from the Centers for Disease Control and the American Academy of Pediatrics are followed, children will receive at least at least 20 vaccinations by the age of 6 (Brady et al., 2011). In addition to routine pediatric check-ups, more than 5 million children will have surgery in the United States every year (Kain, Mayes, Caldwell-Andrews, Karas, & McClain, 2006). Unfortunately, research shows that these experiences can be overwhelming for children. Children's fear of needles and injections is well-documented (Brady et al., 2011; Hamilton, 1995); and procedures such as anesthesia induction give children significant anxiety (Chorney & Kain, 2009; Kain, Mayes, O'Connor et al., 1996; MacLaren & Kain, 2009). This may lead

to children resisting treatment and medical care (Chorney & Kain, 2009; Eldridge & Kennedy, 2010), which can cause schedule delays and increase the number of staff and resources required to provide pediatric care (Eldridge & Kennedy, 2010).

Beyond regular doctor visits and outpatient care, children may also be hospitalized for a period of time. Hospitalization presents many challenges for children including separation from parents (Bell, Johnson, Desai, & McLeod, 2009; McCann & Kain, 2001), being in an unfamiliar environment, not knowing what to expect (Eldridge & Kennedy, 2010), disruption of routines, lack of choices and control, and difficulty in understanding complicated information (Bolig & Weddle, 1988). In a study of young children, Salmela, Salantera and Aronen (2009) found that 90% of children surveyed had at least one fear in the hospital setting. Children who are hospitalized may experience aggression (M. L. Thompson, 1994), attitudinal and affective changes (M. L. Thompson, 1994), significant distress (Chorney & Kain, 2009), anxiety (McCann & Kain, 2001; M. L. Thompson, 1994), disturbances in sleeping or eating (McCann & Kain, 2001; M. L. Thompson, 1994), apathy and withdrawal (McCann & Kain, 2001), and new-onset enuresis (McCann & Kain, 2001).

Various factors contribute to a child's emotional reaction to the hospital setting, including the child's age (Eiser, 1990; Kain, Mayes, O'Connor et al., 1996; Rennick, Johnston, Dougherty, Platt, & Ritchie, 2002), gender (Brewer, Gleditsch, Syblik, Tietjens, & Vacik, 2006; Eiser, 1990; Hurtig, Koepke, & Park, 1989; R. H. Thompson, 1985), parental anxiety and behaviors (Kain et al., 1996; Mahoney, Ayers, & Seddon, 2010), temperament of the child (Kain, Mayes, O'Connor et al., 1996), previous medical experiences (Dahlquist et al., 1986; Eiser, 1990; Kain, Mayes, O'Connor et al., 1996;

Rennick et al., 2002), and the severity of the child's condition (Rennick et al., 2002). Studies show that children who are younger (typically between the ages of 7 months and 4 years) (Chorney & Kain, 2009; King & Ziegler, 1981; Mabe, Treiber, & Riley, 1991; McClowry, 1988; R. H. Thompson, 1985), have had more invasive procedures (Rennick et al., 2002), and have had more severe illness (Rennick et al., 2002), may be most vulnerable to long-term negative outcomes.

Research following children's health care experiences shows lasting negative effects. Many children will continue to experience negative behavioral changes two weeks after a procedure (Kain, Mayes, O'Connor et al., 1996; R. H. Thompson & Vernon, 1993). Rennick et al. (2002) found that some children continue to experience medical fears six months after being discharged from the hospital. Without intervention, common stressors of hospitalization can interfere with a child's normal development (Child Life Council, 2008; Luthar, Cicchetti, & Becker, 2000).

Appropriate Interventions for Children in the Health Care Setting

Research shows that health care professionals can provide appropriate interventions to reduce children's anxiety and promote children's coping skills. For example, children with high anxiety during venepuncture tend to have very negative memories of the experience, which often also predicts children finding procedures of the same kind to be more painful in the future (Noel, McMurty, Chambers, & McGrath, 2010). However, children with medical staff present that promoted coping behaviors were more capable of accurately framing the procedural experience two weeks later (Noel et al., 2010). Further, Mahoney, Ayers, & Seddon (2010) found that health care professionals' behavior during venepuncture is important in encouraging children's coping behaviors. Children often will engage in coping behaviors only after they are

prompted to do so by adults (Chorney & Kain, 2009). Another important intervention on behalf of health care professionals is preparation for surgery, which can decrease anxiety levels in children significantly (Brewer et al., 2006). For emergent care, a recent study demonstrated that psychological intervention significantly decreased chest pain and somatization in children and adolescents (Lipsitz, Gur, Albano, & Sherman, 2011). Eldridge & Kennedy (2010) assert that "use of age-appropriate and patient-guided nonpharmacologic techniques to reduce patient distress improves the efficiency of emergency care delivery as well as improves patient, family, and health care staff satisfaction" (p. 249). Health care professionals can also learn how to make certain routine treatments more bearable for children. For example, a study of young infants found that when health care professionals administered three immunizations simultaneously, as opposed to three separate immunizations, the infant's pain and distress were reduced (Hanson et al., 2010).

Health care professionals should work together to achieve optimal outcomes for pediatric patients (Goldberger, Mohl, & Thompson, 2009). Though each interdisciplinary team member may offer different services to each patient and family, every health care professional – medical and non-medical – can work together to improve children's health care experiences (Eldridge & Kennedy, 2010). This means that physicians, physician's assistants, nurses, child life specialists, social workers, physical therapists, hospital administrators and others can all have a role in providing optimal psychosocial care to children in the health care setting.

Health Care Professionals' Knowledge and Practice of Psychosocial Care

In order to improve children's health care experiences, health care providers must be competent in how child development relates to children's understanding of

illness (Perrin & Perrin, 1983) and how children may perceive situations in the hospital setting (Vacik, Nagy, & Jessee, 2001). Research on children's comprehension of health and illness (Banks, 1990; Bibace & Walsh, 1980; Carson, Gravley, & Council, 1992; Crisp, Ungerer, & Goodnow, 1996; Harbeck & Peterson, 1992; Kalish, 1997; Kister & Patterson, 1980; Koopman, Baars, Chaplin, & Zwinderman, 2004; Lipson, 1993; Perrin & Gerrity, 1981; Rushforth, 1999; L. R. Schmidt & Frohling, 2000; Siegal, 1988; Sigelman, Maddock, Epstein, & Carpenter, 1993; Springer & Ruckel, 1992), body parts and functions (Scolnik, Atkinson, Hadi, Caulfeild, & Young, 2003; Vessey & O'Sullivan, 2000), and management of illness (C. K. Schmidt, 2002) can assist health care professionals in understanding how to communicate with children on various medical topics. By being competent in child development and how children perceive health related issues, health care professionals can provide developmentally appropriate care to help children cope in the hospital setting.

A study on health care providers knowledge of children's understanding of illness by Perrin & Perrin (1983) reported that when health care providers and students (pediatricians, nurses, and child development students) were given statements children made regarding illness, they were only accurate in estimating the age of the child less than 40% of the time. Health care professionals and students often overestimated what young children may be able to understand, and underestimated what older children may be able to understand (Perrin & Perrin, 1983). Perrin & Perrin (1983) concluded that learning how children understand illness may improve health care providers' communication with children.

Similarly, Vacik et al. (2001) assert that many problems children experience in the health care setting could be resolved if health care providers could understand the children's perspective on various situations. Vacik et al. (2001) performed a study assessing nursing, social work, child life, and counseling education students on their knowledge of children's understanding of illness concepts. Using the same instrument as Perrin & Perrin (1983), they found that students were only knowledgeable of children's understanding of illness on 38% of the items.

Other research supports the need for more training for health care professionals in the areas of patient-centered communication (Curley, 1998; Levinson, Lesser, & Epstein, 2010); such as patients' "preferences, concerns, or emotions"(Haidet et al., 2002) and biopsychosocial issues which consider "the patient-physician relationship, ethics, clinical epidemiology, nutrition, behavioral science, and the like" (H. Schmidt, 1998). There is much room for improvement in preparing health care professionals for the psychosocial aspect of working with patients and families (Hafferty, 1998; Levinson et al., 2010; H. Schmidt, 1998). In a study on how health care professionals respond to pain in children postoperatively, Simons and Roberson (2002) found that nurses' knowledge deficits and poor communication with parents lead to poor pain management in children. Simons and Roberson (2002) assert that understanding pain in children is complex and requires knowledge of the child's development to know how the child will perceive and cope with their pain. Further, Brady et al. (2011) found that even though 90% of primary care providers were aware of the pain and anxiety for pediatric patients surrounding their vaccine injections and believed that it was possible to alleviate that pain and anxiety, only 11% of primary care providers utilized the techniques to reduce

pain and anxiety. Schechter, Bernstein, Zempski, Bright & Willard (2010) explain that despite strategies being available to relieve pain and anxiety associated with immunizations, pediatric providers often do not utilize these strategies. However, their study found that a small-group, 1-hour teaching session at the site of care leads to measurable improvements in health care professionals' utilization of pain-reducing techniques at 1 and 6 months after the training (Schechter, Bernstein, Zempski, Bright, & Willard, 2010).

In summary, research shows that effective intervention from health care providers can significantly improve children's medical experiences. There is a need for further training in the areas of child-specific needs and other aspects of patient care for health care students (Hafferty, 1998; Haidet et al., 2001; Perrin & Perrin, 1983; H. Schmidt, 1998; Vacik et al., 2001), and health care professionals (Levi, 2007; Rae, McKenzie, & Murray, 2010; Simons & Roberson, 2002).

Focus of Research

The purpose of this research is to understand how well students who are in the health care field are prepared to work with children. Participants will include nursing, medical, physician assistant, physical therapy, and non-clinical health care students. The aim of this research is to understand what factors predict more knowledge of developmentally appropriate care with children in the health care setting among health care students. Further research on health care professionals' knowledge of DAC will be useful for guiding further training. This information will be valuable for healthcare students, academic training programs, healthcare professionals, and policy makers.

Research Questions

1. How does knowledge of developmentally appropriate care with children and intent to work with children in the health care setting vary between the observed fields of study?

2. To what extent do confidence, experience, and patient-practitioner orientation predict students' knowledge of developmentally appropriate care with children in the health care setting within the observed fields of study?

3. How are students' knowledge, confidence, experience, intent to work with children, and demographic characteristics associated with interest in future training on developmentally appropriate care with children in the health care setting?

CHAPTER 2
LITERATURE REVIEW

Health Care Professionals' Ethical Responsibilities for Children

"You judge a society by how it treats its most vulnerable citizens" - (Bass, n.d.)

Children's Rights

The United Nations Convention on the Rights of the Child set a foundation for specifically exploring and mandating children's rights (Goldhagen, 2003). Several articles are relevant to psychosocial aspects of care for children in the health care setting specifically, including articles related to non-discrimination (2), best interests of the child (3) , survival and development (6), respect for views of the child (12), freedom of expression (13), right to privacy (16), access to information for health and well-being (17), children with disabilities (23), health and health services (24), right to education (28), leisure, play and culture (31), other forms of exploitation (36), and knowledge of rights (42) (United Nations, 1989). This framework has been used to advocate for health care professionals' responsibility in reducing pediatric pain whenever possible (Kuttner, 2010) and as a framework for pediatricians in delivery of care (Goldhagen, 2007).

Organizations such as the United Nation's International Children's Emergency Fund (UNICEF) strive to uphold children's rights as set forth by the United Nations Convention on the Rights of the Child (UNICEF, n.d.). In response to the importance of health care professionals understanding and promoting children's needs in the health care setting, the American Academy of Pediatrics, in conjunction with the Royal College of Paediatrics and Child Health, has put together a training referred to as the *Children's Rights Curriculum* for health professionals. This course educates health professionals

on children's rights as they relate to child health, health policy, and practice (American Academy of Pediatrics, n.d.b).

Organizations representing the best interest of children in health care have taken the articles from the UN Convention on the Rights of the Child and have operationalized those concepts into the framework for their practice. For example, Southall et al. (2000) used this to inform a model for Child-Friendly Healthcare in *Child-Friendly Healthcare Initiative (CFHI): Healthcare Provision in Accordance With the UN Convention on the Rights of the Child*. Additionally, the Association for the Care of Children's Health produced *A Pediatric Bill of Rights* in 1991. In 2002, the Child Life Council took over the production of the Bill of Rights to continue to make it available. The publication includes a Bill of rights for Children and Teens, a Bill of rights for Parents, and Family Responsibilities. The Bill of Rights for Children and Teens explains what can be expected from their health care experience.

Health care professionals have a responsibility to deliver care in a way that is consistent with children's rights. This includes delivering care that is supportive of the child and their family, explaining information in a way that children understand, providing emotional support, respecting and encouraging the child's need for growing, playing, and learning, and supporting children's desire and ability to make informed choices regarding their care (I. Child Life Council, 2002; United Nations, 1989).

Health Care Professionals' Ethical Standards

In an afterword of Leora Kuttner's book *A Child in Pain: What Health Professionals Can Do to Help*, Neil Schechter concludes with "if we, as health professionals and advocates for children, do not lead the way, who will?" (p. 361). Health care professionals are held to codes of ethical responsibility by their professional certifying

organization, as well as their place of employment (American Medical Association, n.d.; American Nurses Association, 2011; I. Child Life Council, 2002; National Association of Social Workers, 2008; Public Health Leadership Society, 2002). Additionally, the American Academy of Pediatrics has a Committee on Bioethics (COB) which specifically addresses issues central to provision of care in pediatrics (American Academy of Pediatrics, n.d.a). It is also important for health care professionals to consider the physician-patient-parent triad as it relates to the delivery of care (Cummings & Mercurio, 2010). Children's preferences may differ from their parents, or adolescents may prefer to talk to their health care provider about issues that they are not comfortable discussing with their parents (Schaeuble, Haglund, & Vukovich, 2010). It is important for health care professionals to consider their own ethical obligations in the delivery of care that considers children and families' emotional, social, physical and cognitive processes.

Children Want to Know

Children desire to know what they will experience, and it is important for health care professionals to provide this information in a developmentally appropriate way (Fortier et al., 2009). According to article 12 of the United Nation's Convention on the Rights of the Child, children have the right to be listened to and taken seriously (United Nations, 1989). Smith and Callery (2005) found that many children know very little about what to expect during their health care experience, noting that children in their study "identified 61 questions about their forthcoming admissions, including questions about: getting information; procedures; anesthesia; timing; hospital environment; family support; feelings/pain; their own condition; and concerns" (p. 230). Smith & Callery (2005)

conclude that despite children's cognitive ability to verbalize their own information needs, patients may be provided little information prior to their visit.

Fortier et al. (2009) found that most children prefer comprehensive information about their surgery, particularly what kind of pain they will experience and how long it will last. They also found that children who were more anxious desired knowledge about the pain they would experience instead of avoiding the information. Preadolescents were particularly interested in what the perioperative environment would look like, and children who had surgery before were not any less inquisitive than children who were having surgery for the first time (Fortier et al., 2009).

Additionally, recent research on adolescents' health care preferences shows that respect and trust from their primary health care provider are extremely important (Schaeuble et al., 2010). Adolescents also desire to be involved in the planning and management of their care, and value confidentiality in health care providers (Schaeuble et al., 2010).

We now know that children and adolescents desire information regarding their health care experience. It is also clear that children and adolescents want to be a part of the planning and management of their care. Therefore, it is important that providers understand how to share that information with children in a developmentally appropriate way that respects their personal preferences and values.

Health Care Professionals' Role in Improving Children's Experiences

Health care professionals can provide appropriate interventions to reduce children's anxiety and increase the ease with which procedures can take place. For example, various techniques have proven to be effective in reducing anxiety before, during, and after venepuncture. Research shows that the "Cough Trick" (asking children

to cough once, and then again, while on the second cough inserting the needle) can be an effective method for reducing pain in this procedure (Dustin, Allen, Lacroix, & Pitner, 2010). Another study found that when infants received three immunizations simultaneously, as opposed to three separate immunizations, the infant's pain and distress were reduced (Hanson et al., 2010). These ideas can be incorporated into health care professionals' procedural techniques.

Studies have found that adult behaviors can greatly influence children's distress during painful medical procedures (Brewer et al., 2006; Noel et al., 2010). McMurty et al. (2010) explain that children's distress increases when adults reassure children with phrases such as "it's okay". Distraction techniques during a procedure are more effective in promoting child coping (Noel et al., 2010). Further, children often engage in coping behaviors only after they are prompted to do so by adults (Chorney & Kain, 2009). Children who receive psychological preparation for procedures will have significantly lower anxiety (Brewer et al., 2006), significantly decreased chest pain and somatization (Lipsitz et al., 2011), increased efficiency in emergency care (Eldridge & Kennedy, 2010), and improved satisfaction (Eldridge & Kennedy, 2010). Psychological preparation for procedures is a skill that requires knowledge of developmentally appropriate communication and how children respond to various adult behaviors and information.

Patient-Centered Communication

"Communication is the most common 'procedure' in medicine." – (Levetown & the Committee on Bioethics, 2008)

The Institute of Medicine (2001) defines patient-centered health care as "providing care that is respectful of and responsive to individual patient preferences, needs, and

values, and ensuring that patient values guide all clinical decisions" (p. 3). Patient-centered communication has positive impacts on patient outcomes, including improved patient satisfaction, adherence, and self-management (Levinson et al., 2010). Patient-centered communication skills are important for a successful health care setting (Levinson et al., 2010). Levinson, Lesser & Epstein (2010) assert that "patient-centered communication is more than simply being courteous and honest with one's patient; it is, in fact, a sophisticated process" (p. 1310). It is both verbal and non-verbal (R. M. Epstein & Street, 2007; R. M. Epstein & Hundert, 2002; Levinson et al., 2010). A recent study by Tanner, Stein, Olson, Frintner and Radecki (2009) found that to establish an effective patient-practitioner relationship, it was important for the clinician to have multiple visits with the same patient, establish trust, and prioritize the family's needs.

A report by the Institute of Medicine (2001) identified patient-centered health care as one of the six aims for improvement in advancing quality care in the 21st century. Further, the Institute of Medicine (2001) asserts that in order to change the environment of health care delivery, the workforce must be prepared accordingly:

> Health care is not just another service industry. Its fundamental nature is characterized by people taking care of other people in times of need and stress. Stable, trusting relationships between a patient and the people providing care can be critical to healing or managing an illness. Therefore, the importance of adequately preparing the workforce to make a smooth transition into a thoroughly revamped health care system cannot be underestimated. (p. 6).

The National Cancer Institute provides a model that defines three elements of patient-centered care: (1) informed, activated, participatory patient and family, (2) accessible, well-organized, responsive health care team, and (3) patient-centered communicative clinician (R. M. Epstein & Street, 2007). These elements work together to achieve improved communication and health outcomes. Epstein & Street (2007)

assert that all aspects of patient-centered care are important, as any missing element can result in patients receiving less than exceptional care.

The medical community has recognized the need for more formal training on patient-centered communication (Curley, 1998; Levinson et al., 2010). This means considering the patients' feelings and preferences (Haidet et al., 2002) and biopsychosocial issues (H. Schmidt, 1998). Haidet et al. (2002) found that students who had more patient-centered attitudes were female, Caucasian, had more children, were planning to go into primary care specialties, and had experience in the profession.

Children's Understanding of Illness

Providing patient-centered communication with children requires health care professionals to be knowledgeable of what children can reasonably understand (Perrin & Perrin, 1983; Vacik et al., 2001). Many studies have assessed children's understanding of illness, in order to provide adults with information on how to more efficiently communicate with children in the health care setting (Banks, 1990; Bibace & Walsh, 1980; Carson et al., 1992; Crisp et al., 1996; Harbeck & Peterson, 1992; Kalish, 1997; Kister & Patterson, 1980; Koopman et al., 2004; Lipson, 1993; Myant & Williams, 2008; Perrin & Gerrity, 1981; Rushforth, 1999; L. R. Schmidt & Frohling, 2000; Siegal, 1988; Sigelman et al., 1993; Springer & Ruckel, 1992; Varkula, Resler, Schulze, & McCue, 2010).

Piaget's theory of cognitive development is the most frequently used theoretical framework to convey children's understanding of illness (Rushforth, 1999). Piaget proposes a cognitive theory for children's ability to comprehend information, including the following four stages: sensorimotor (birth – 2 years), preoperational (2 – 7 years),

concrete operational (7 – 11 years), and formal operational (11+ years) (Koopman et al., 2004; Piaget, 1962; Turner, 2009).

Building on Piaget's theory of cognitive development, Bibace and Walsh (1980) developed a framework for how children understand illness. For three stages of Piaget's cognitive development, Bibace and Walsh (1980) have identified two phases of children's concepts of illness within each. Phenomenism and Contagion are specific to children in the Preoperational Stage, as children in this stage of development believe that illness is transmitted magically from an external object or person (Bibace & Walsh, 1980). Children in the Concrete Operational Stage align with Bibace and Walsh's concepts of Contamination and Internalization. Children in this phase are beginning to understand internal organs and will recognize illness as harmful. Bibace and Walsh (1980) use the terms Physiological and Psychophysiological to refer to children's understanding of illness in the Formal Operational Stage. Children in this developmental stage understand that even though the cause of illness may still be external, there is a series of events inside the body that result in an illness. Bibace and Walsh (1980) explain that children in this stage are also able to understand the relationship between emotional health and overall wellness. The relationship between Piaget's Theory and Bibace and Walsh's Concepts of Illness is outlined in Table 2-1.

Perrin & Perrin (1983) used an instrument that corresponded with Piaget's Theory of Cognitive Development to assess health care professionals and students on their knowledge of children's understanding of illness. They found that when health care professionals were presented with statements children made and then were asked to assess their age, females underestimated children's age and males overestimated

children's age. Similarly, Vacik, Nagy & Jessee (2001) conducted a similar study with graduate students and found that participants assumed most children to have the understanding of a school-age child, even if the child was older or younger. Both studies found that there were no statistically significant differences in the knowledge of participants based on their field (Perrin & Perrin, 1983; Vacik et al., 2001). Additionally, age, experience (stage of training, length of practice), and physician group (resident, faculty, practicing pediatricians), did not present statistical differences in the analyses (Perrin & Perrin, 1983). Vacik, Nagy, & Jessee (2001) reported that even though 99% of their sample had taken a course in child development, overall most participants did not correctly assess children's understanding of illness.

Limitations of Piaget's Theory in Cognitive Development

Studies have found limitations in the use of Piaget's and Bibace and Walsh's theories as theoretical framework for instruments measuring children's understanding of illness. Varkula, Resler, Schulze & McCue (2010) found that some preschoolers were using more advanced terminology to describe cancer, such as an "illness" or something "bad". They assert that "children seemed to be presenting a more advanced, less concrete conception of cancer, not as easily explained by the theory of Bibace and Walsh. These children seem to raise the question of the accuracy of their hypothesis about children's understanding of illness at this age, at least in the case of cancer" (p. 30).

Vacik, Nagy & Jessee (2001) acknowledge that Piaget's theory has received criticism and that using a Piagetian framework for instruments measuring health care students' knowledge may result in an inadequate assessment of their knowledge of children's understanding of illness (Vacik et al., 2001). Gelman (2009) also asserts that children's construction of concepts goes beyond the self-directed learning that Piaget describes.

Children also learn from others (Gelman, 2009). It is important to understand the nature of the input, the nature of the human mind, and how the child and environmental cues facilitate learning the formation of concepts (Gelman, 2009). Rushforth (1999) also asserts that Piaget presents a deficits-based view of children's cognitive abilities rather than a strengths-based perspective. More recent studies provide evidence of children's cognitive abilities surpassing what we might expect them to understand about illness and hospitalization, based on Piaget's framework (Rushforth, 1999).

Training Needs of Health Care Professionals

"Knowing is not enough, we must apply; willing is not enough, we must do." – Goethe

Development and Behavior

Perrin & Perrin (1983) report that "pediatricians are typically inadequately trained in developmental processes and their assessment" (p. 887). Knowledge of children's normal development and behavior is important for pediatricians, as they will use this to inform their detection of behavioral issues and developmental delays (Boreman, Thomasgard, Fernandez, & Coury, 2007). In addition, 47% of physicians report that the patients they care for require expertise in developmental or behavioral pediatrics, and 51% reported caring for patients who require subspecialties in adolescent medicine (Freed et al., 2009).

Despite this prevalence, Boreman et al. (2007) report that many pediatricians are not thoroughly trained in behavioral and developmental issues, resulting in pediatricians having lower perceived competence. Tanner et al. (2009) also found that pediatricians felt there was room for improvement in detecting developmental and behavioral problems earlier; and that improving resident training and ongoing education for pediatricians in this area was necessary. Further, when Boreman et al. (2007) surveyed

pediatricians, many felt less than comfortable providing primary care to patients regarding developmental or behavioral issues, as compared with general areas of pediatrics.

In a study by Blum & Bearinger (1990) physicians, nurses, social workers, psychologists, and nutritionists felt inadequate in providing primary care to adolescents in the areas of development, prevention, sexual counseling, contraceptive services, substance abuse prevention, and family conflict. Blum & Bearinger (1990) assert that facilitating this care would require health care providers to have an understanding of development. Excessive time demands and insufficient training were two main barriers health care providers identified in serving adolescents (Blum & Bearinger, 1990).

Communication

A recent study by Tanner et al. (2009) found that pediatricians felt training during residency was insufficient in the areas of interviewing and communication skills. Further, pediatricians felt that ongoing professional education would be important for improving their practices with well-child visits (Tanner, Stein, Olson, Frintner, & Radecki, 2009). As a result, there is much room for improvement in preparing health care professionals for the psychosocial aspect of working with patients and families (Hafferty, 1998; Levetown & the Committee on Bioethics, 2008; Levinson et al., 2010; H. Schmidt, 1998). Levetown et al. (2008) assert that there is little education on communication in pediatric training, despite its tandem relationship with delivery of care. The Committee on Psychosocial Aspects of Child and Family Health (2001) also emphasizes the importance of conveying empathy to patients and their families.

Health care professionals face barriers to the provision of patient-centered care daily, and it is important that they are equipped to overcome these challenges. For

example, Curley et al. (1998) discuss the daily challenges that get in the way of nurses providing optimal care to patients, asserting that “lower nurse-to-patient ratios, increased use of unlicensed assistive personnel, and shorter lengths of hospitalization, layered on a cumbersome healthcare system, challenge nurses ability to provide adequate care as traditionally defined for patients” (p. 64). Curley et al. (1998) suggest that certification programs and recertification processes should address and encourage further professional development.

Levetown et al. (2008) report that empathy in the medical field has not improved in the last 15 years, which is certainly reflected in the quality of patient-centered care. Further, Levetown & the Committee on Bioethics (2008) explain that current efforts to improve psychosocial competencies in physicians are not successful, as it may not be seen as cost-effective for physicians to spend extra time discussing families’ feelings, concerns, and preferences. Levetown et al. (2008) assert that “Despite the overwhelming evidence of the benefit to patients, physicians, and society, effective communication is not rewarded by academic promotion or financial compensation” (p. e1443).

Hafferty (1998) suggests that improving the quality of medical education is much more complex than simply adding a new course on the topic, as learning in medical school encompasses the formal curriculum (courses and clinical experience), informal curriculum (the interpersonal educational interactions between the professors and students), and the hidden curriculum (organizational and cultural influences); all of which must be addressed to effectively improve medical education. Levinson et al. (2010) also assert that a class, alone, cannot improve a physician’s patient-centered care. Developing a physician’s communication skills requires practice and feedback,

similar to learning to perform a medical procedure (Levinson et al., 2010). Further, developing physician's communication skills requires that they are reflective and able to understand how their own emotional responses may impact their communication and cognitive process (Levinson et al., 2010).

Theoretical Framework

This research seeks to understand future health care professionals' knowledge of developmentally appropriate care with children in the health care setting. This topic is important in the health care field, as it relates to training and practice, and is relevant to the overall purpose of bettering the health care experience for children. The predictors chosen in this study will provide important insight into practitioners' knowledge of DAC. Though previous research does not present results on knowledge of DAC, interest in training on DAC, or confidence in providing DAC, this literature review has attempted to justify the need for such research.

Additionally, constructs from Adult Learning Theory and Social Learning Theory will be discussed as a framework for the concepts measured in this study. Epstein & Hundert (2002) defined professional competence in the health care field as "the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values and reflection in daily practice for the benefit of the individual and the community being served." Thus, a theory that acknowledges effective methods of training to achieve these outcomes is necessary.

Adult Learning Theory

Adult learning theory has been presented for use in medical education (Abela, 2009; Kaufman, 2003). Specifically, "andragogy" was introduced to North America by Malcom Knowles (Kaufman, 2003). This theory assumes that the learner is self-directed

(Abela, 2009). Andragogy is grounded in the assumption that adults (1) are independent and self directing, (2) have experience that can be used as a resource for learning, (3) value learning that is useful for their everyday life, (4) are more interested in immediate problem centered approaches than in subjected centered ones and (5) are more motivated by internal drives than external drives (Abela, 2009; Kaufman, 2003). Learners should feel comfortable in the adult learning environment (Kaufman, 2003), and it is important to foster respect between the teacher and learner (Abela, 2009). Andragogy calls teachers to involve learners in curriculum planning and formulation of objectives when possible, engage learners in reflecting on their own needs (triggering internal motivation), encourage learners to develop plans and find resources, support learners in seeing their plans through, and involve learners in critical reflection by having them evaluate themselves (Kaufman, 2003). Critics of andragogy feel that reflection is left out of this process of adult learning and does not consider individuals who are extrinsically motivated (Abela, 2009).

Social Learning Theory

Bandura's social learning theory also has a strong application to the medical education setting. Social learning theory (Bandura, 1977) supplements constructs from adult learning theory by emphasizing the importance of self-efficacy and external motivation. The social learning theory presents a framework for psychological functioning that assumes individuals learn and model behavior by observing others. This theory assumes an ongoing interaction between the individual and his or her environment, acknowledging that learned behaviors are impacted by the individuals' psychological and physiological development, as well as biological factors (Bandura, 1977). Social learning theory asserts that individuals learn through the modeling of

others (Bandura, 1977). Through modeling, individuals are able to observe the outcomes of specific behaviors, allowing them to assess whether or not to adapt the behavior based on the outcome observed. Bandura (1977) uses the examples of teaching children to swim, adolescents to drive, and medical students to perform operations in explaining the importance of allowing individuals the opportunity to learn from another competent individual before trying it themselves for the first time.

In *Applying Educational Theory in Practice,* Kaufman (2003) presents self-efficacy as an important concept for application to learning and teaching in the medical field. Self-efficacy is and individual's assessment of their ability to perform an action (Bandura, 1977; Kaufman, 2003). When an individual believes that he or she can accomplish a certain behavior, and that the behavior will lead to a desired outcome, the individual is more likely to perform that behavior (Bandura, 1977). Kaufman (2003) explains that self-efficacy is the result of four main sources of information: "performance attainments, observations of other people, verbal persuasion, and physiological state" (p. 214). Failures lower individual's self-efficacy, especially if failure occurs at the beginning of a learning process (Kaufman, 2003). Individuals feel mastery as a result of a successful performance (Bandura, 1977), which increases one's efficacy expectations. An individual's self-efficacy can be strengthened by verbal reinforcement and through observing other successful performances of similar individuals (Kaufman, 2003).

In summary, constructs from adult learning theory and social learning theory can be applied to concepts studied in this research. Adult learning theory addresses the knowledge acquisition process as it relates to medical education, while social learning

provides insight into the importance of self-efficacy, mastery, and motivation for adults to continue learning. Adult learning theory and social learning theory collectively relate this study's conceptual framework of future health care professionals' knowledge (competence), confidence (self-efficacy), and desire (motivation) for future training on the topic of developmentally appropriate care with children in the health care setting. By examining which variables are correlated with future health care professionals' knowledge of and interest in training on developmentally appropriate care with children in the health care field, this research will present valuable information for the education in the health care field.

Hypotheses

- RQ1: How does knowledge of developmentally appropriate care with children and intent to work with children in the health care setting vary between the observed fields of study?

  H1.1: Knowledge of developmentally appropriate care with children in the health care setting will not vary by field (Perrin & Perrin, 1983; Vacik et al., 2001).

  H1.2: Knowledge of developmentally appropriate care with children in the health care setting will not vary by students' intent to work with children in their career (Blum & Bearinger, 1990; Boreman et al., 2007; Tanner et al., 2009).

- RQ2: To what extent do confidence, experience, and patient-practitioner orientation predict students' knowledge of developmentally appropriate care with children in the health care setting within the observed fields of study?

  H2: Students with more patient-centered views, and who have more personal and professional experience with children (Abela, 2009; Bandura, 1977; Kaufman, 2003), will have more knowledge of developmentally appropriate care with children in the health care setting. Based on previous research by Perrin & Perrin (1983) and Vacik et al. (2001), it is predicted that a course in child development will not be a predictor variable for knowledge of DAC in this study. Additionally, demographic characteristics, having taken a seminar on DAP, and confidence will not significantly predict knowledge.

- RQ3: How are students' knowledge, confidence, experience, intent to work with children, and demographic characteristics associated with interest in future

training on developmentally appropriate care with children in the health care setting?

***This hypothesis is exploratory in nature, and for that reason a specific hypothesis will not be informed by previous research.

H3.1: Does interest in future training on developmentally appropriate care with children in the health care setting vary by field of study?

H3.2: Does interest in future training on developmentally appropriate care with children in the health care setting by students' vary by intent to work with children in their career?

H3.3: How are students' knowledge, confidence, experience, intent to work with children, and demographic characteristics correlated with interest in future training on developmentally appropriate care with children in the health care setting.

Table 2-1. The relationship between Piaget's Cognitive Theory and Bibace and Walsh's Concepts of Illness

Child's Age	Piaget's Theory of Cognitive Development	Bibace and Walsh: Children's Concepts of Illness *Examples from Bibace and Walsh (1980) pp. 914 – 915	
0 – 2 years	Sensorimotor		
2 – 7 years	Preoperational	Phenomenism	Children will perceive the cause of illness as something concrete and external, but will not be able to articulate how it occurred. **Example: How do people get colds? "From the sun." or "From trees."*
		Contagion	Children will perceive the cause of illness as objects or people near them. Transmission of illness is considered to be magical. **Example: How do people get colds? "When someone else gets near them."*
7 – 11 years	Concrete Operational	Contamination	Children will perceive the cause of illness to be from making contact with someone who is sick, or from engaging in an action that results in illness. **Example: What is a cold? "It's like in the wintertime." How do people get them? "You're outside without a hat and start sneezing. Your head would get cold – the cold would touch it – and then it would go all over your body."*
		Internalization	Children will perceive illness as something external that they can internalize through breathing or swallowing. **Example: How do people get colds? "In winter, they breathe in too much air into their nose and it blocks up the nose." How does this cause colds? "The bacteria gets in by breathing. Then the lungs get too soft (child exhale), and it goes to the nose."*
11 + years	Formal operational	Physiological	Children will perceive the illness as something that may be caused from something external, but ultimately results from internal processes ceasing to function properly. **Example: How do people get colds? "they come from viruses I guess. Other people have the virus and it gets into your bloodstream and it causes a cold."*
		Psychophysiological	Children will acknowledge that illness can come from an external source and may also be caused by internal physiologic factors. Children understand that an individual's emotions can impact their well-being. **Example: How do people get a heart attack? "It can come from being all nerve wracked. You worry too much. The tension can affect your heart."*

CHAPTER 3
METHODOLOGY

"Science is not a set of definitive results; rather, it is a way of understanding the world around us." – (Rumrill & Bellini, 1999)

Research Design

This is a cross-sectional study, a type of observational design that collects data at one point in time with a single instrument (Agresti & Finlay, 2009). De Vaus (2005) outlines four main components of the cross-sectional design. First, the design assumes that there are existing differences within the groups (de Vaus, 2005). In this study, all groups are currently students that plan to (or currently) work in the health care field.

Second, there is a minimum of one independent variable and the presence of at least two categories (de Vaus, 2005). In this study, the variables of interest in the study are race, gender, age, field of study, personal, professional, and educational experience with children, knowledge and confidence in working with children in the health care setting, intent to work with children and patient-practitioner orientation.

Third, data are collected at one point in time, typically in the form of a survey (Agresti & Finlay, 2009; de Vaus, 2005). There is no time dimension. This means that cross-sectional designs are excellent for measuring the differences between groups; however, they are not able to measure change as a result of intervention (de Vaus, 2005). For this study, data were collected in the time range of December 2010 – April 2011.

And finally, groups are not randomly allocated (de Vaus, 2005). The data for a cross-sectional design are examined by "the extent to which variation in the outcome variable is linked with group differences. That is, to what extent do those in different categories of the independent variable differ in relation to the outcome variable?" (de

Vaus, 2005). So instead of using random assignment to groups, a cross-sectional design relies on statistical controls to identify causal relationships (de Vaus, 2005). The subsamples in this study (students from the five different areas of study: medical, physician assistant, nursing, physical therapy, and non-clinical health care professions) have not been randomly allocated into groups.

Data Collection

Sample Selection

This study addresses which variables correlate with future health care professionals having more knowledge of DAC and a desire for future training regarding developmentally appropriate care with children in the health care setting. As a result, the study participants were students pursuing careers in the health care field. The survey was administered to nursing, medical, physician assistant, physical therapy, and non-clinical health care students at the University of Florida. Only students who indicated that they plan to work in the health care field were considered. Further, only participants who are in their terminal degree program will be considered as future health care professionals. For example, students in the College of Medicine who indicate that they will be a physician are included in the sample. However, students in the College of Health and Human Performance who have intentions of becoming a physician, but are not currently in the College of Medicine, were not considered.

Instrumentation

Research shows that instrumentation based on a Piagetian framework has limitations (Vacik et al., 2001). Further, Piaget's theory underestimates children's cognitive capabilities (Rushforth, 1999) and fails to encompass all of the ways that children learn and form concepts (Gelman, 2009). Health care professionals and

students may also struggle to answer previous questionnaires on children's understanding of illness due to a lack of information with which to assess the age of the child.

Knowledge

This instrument measured knowledge using items from a retired Child Life Professional Certification Examination with express permission from the Child Life Council, the national certifying organization for child life specialists (Child Life Council, n.d.a). Child life specialists are "experts in child development, who promote effective coping through play, preparation, education, and self-expression activities. They provide emotional support for families, and encourage optimum development of children facing a broad range of challenging experiences, particularly those related to healthcare and hospitalization" (Child Life Council, 2008).

The Child Life Professional Examination is "an objective test that covers knowledge, understanding and practical application of professional child life theory" (Child Life Council, n.d.b). The items on this exam identify professionals' knowledge of children's developmental needs in the health care setting. The Child Life Professional Certification Examination is 150 multiple choice questions and eligible candidates are given four hours to complete it. The exam measures candidates' competencies in three domains: assessment, intervention, and professional responsibility (Child Life Council, 2004). Only items from the intervention subscale were considered to be relevant to this study, and many items in this category assumed extensive knowledge of child development theory and practice. As a result, only 13 of 50 retired items were considered to be reasonable for health care professionals in fields other than child life to know, and some items were altered for clarity for health care professionals other than

child life specialists. For example, for the item “Health care providers facilitating preparation for health care experiences should first and foremost consider a child’s…” the wording was changed to “Health care providers who are psychologically preparing a child for health care experiences should first and foremost consider…”. Otherwise, health care providers may be thinking of medical preparation for a procedure. Also, particularly difficult questions that had answers with overlapping ages were made to be more specific. For example, the item “The age range of children most vulnerable to psychological upset related to hospitalization is…” previously had the answer options: (a) Birth to two and one-half years, (b) six months to four years, (c) two years to three years, or (d) three years to six years. The answers were changed to (a) birth to six months, (b) six months to four years, (c) five years to eleven years, and (d) twelve years to eighteen years. The correct answer was still accurate, while making it less confusing for health care professionals that may not be as well-versed in child development theory. Since these items have been altered and are not representative of all domains on the original exam, the items used in this survey were not be an accurate assessment of what future health care professionals’ performance would be on the Child Life Professional Certification Exam.

The mean score of the knowledge of DAC section of the instrument was 7.17 (SD = 1.91). There were 13 items for this section, so the possible range was 0 – 13 correct. The actual range was 10, with a minimum score of 2 and a maximum score of 12.

Confidence in providing developmentally appropriate care

Confidence items were developed using a document from the Child Life Council called the *Child Life Internship Program Self-Review*. These competencies are taught

and tested in the field of child life, as relevant to developmentally appropriate care with children in the hospital setting. Using a 6-point Likert scale ranging from *strongly disagree* to *strongly agree*, participants were asked to assess their level of confidence in effectively explaining illness, procedures, surgeries, and medications to toddlers, preschoolers, school-age children, and adolescents. There are also items designed to measure students' confidence in their abilities to collaborate with families on developmental issues and stressful events, consider diversity and socio-economic issues of patients and their families, and interact and coordinate with interdisciplinary team members.

The mean score of the confidence in providing DAC section of the instrument was 4.35 (SD = 0.79). There range of possible scores for this section was 1 – 6 (strongly disagree to strongly agree), and the actual range was 5.00, with a minimum score of 1 and a maximum score of 6. The confidence in providing DAC scale had a reliability score of $\alpha = 0.87$.

Experience with children: personal, professional, and educational

Participants were asked how much experience the participants have had with children, both professionally and personally. This was measured on a 4-point Likert scale ranging from *none* to *a lot*. The instrument also asked whether or not the student had taken a class or had an in-service training on child development or developmentally appropriate care with children in the health care setting, and how long it had been since that class or in-service training.

Interest in future training

Using a 4-point Likert scale ranging from *very unlikely* to *very likely*, participants were asked how likely they were to attend trainings about explaining illness,

procedures, surgeries, and medicals to children of various ages, collaborate with families on developmental issues and stressful events, consider diversity and socio-economic issues of patients and their families, and interact and coordinate with interdisciplinary team members. Similar to the confidence section, these items were informed by the Child Life Council's *Child Life Internship Program Self-Review*.

The mean score of the interest in future training on DAC section of the instrument was 2.93 (SD = 0.66). There range of possible scores for this section was 1 – 4 (very unlikely to very likely), and the actual range was 3.00, with a minimum score of 1 and a maximum score of 4. The interest in future training scale had a reliability score of α = 0.91.

Patient-practitioner orientation

The Patient-Practitioner Orientation Scale (PPOS) is a valid and reliable instrument that measures how patients, practitioners, and students perceive the patient-practitioner relationship (Haidet et al., 2001; E. Krupat, Hsu, Irish, Schmittdiel, & Selby, 2004; E. Krupat et al., 2000; E. Krupat et al., 2000; E. Krupat, Yeager, & Putnam, 2000; E. Krupat, Bell, Kravitz, Thom, & Azari, 2001; Street, Krupat, Bell, Kravitz, & Haidet, 2003). Previous research reports good reliability for the PPOS instrument (α = .0.73 – 0.83) and its sharing (α = 0.67 – 0.82) and caring (α = 0.52 – 0.80) subscales (E. Krupat, Putnam, & Yaeger, 1996; E. Krupat et al., 2000; E. Krupat, Yeager et al., 2000). The PPOS instrument has 18 items with a 6-point Likert scale ranging from *strongly agree* to *strongly disagree*. In the instrument used for this research, the scale was presented as *strongly disagree* to *strongly agree*. Higher scores indicate a more patient-centered (egalitarian) attitude, while lower scores indicate a more doctor-centered (paternalistic) attitude (Haidet et al., 2001). There are two subscales on this instrument

(sharing and caring), each consisting of 9 items. The sharing subscale measures the degree to which the participant believes physicians should share information with the patient, and power and control are equal between the two (Haidet et al., 2001; E. Krupat et al., 2000). The caring subscale measures the degree to which the participant believes that the patient's feelings, self-identified needs, and personal circumstances should inform the plan of care (Haidet et al., 2001; E. Krupat et al., 2000).

For this study, the overall PPOS score was used, while the subscales were not. The mean score of the PPOS section of the instrument was 4.42 (SD = 0.47). There range of possible scores for this section was 1 – 6 (increasing as patient-centeredness increased), and the actual range on this scale was 4.06, with a minimum score of 1.83 and a maximum score of 5.89. The Patient-Practitioner Orientation Scale had a reliability score of $\alpha = 0.76$.

Demographics

Participants were asked to identify their gender, age, marital status, how many children they have, race, graduate /undergraduate status, undergraduate major/minor, whether or not they plan to work in the health care field, college, year in current program, future career plans, and main area of interest or specialty.

Pre-Testing

This instrument was pre-tested with multiple phases. First, the principal investigator's committee gave feedback on the instrument. Then, students took the survey and gave feedback; including a research methods class that gave feedback on its clarity, length, and ability to measure the main concepts. Students felt that the items were reasonable for health care professionals in various areas of study to understand, and that the instrument was applicable to the population of interest. After refining the

survey with feedback from students, it was sent out to professors knowledgeable in the area of instrumentation and health care professions to receive their feedback. The survey was modified again, and then was reviewed by current physicians and nurses. The survey was modified again. Finally, the survey was sent back to the principal investigator's thesis committee for review. After approval, it was submitted to the University of Florida's Institutional Review Board that reviews Behavioral/Non-Medical studies (IRB-02). The instrument received approval from IRB-02.

Procedure

The principal investigator contacted professors currently teaching eligible participants. Despite the rigorous schedule of most students entering the health care field, many professors were happy to allocate 15 minutes of their class time for their students to complete the survey.

Another option for data collection, also approved by IRB-02, was for students to take the survey online. This was mostly used by professors teaching online courses, distance courses, or who did not have available class time for survey administration. As an incentive for professors to allocate time for the survey to be distributed in class, the principal investigator offered to present a workshop on developmentally appropriate care with children in the health care setting. Some professors did request this presentation, and the workshop was tailored to the specific curriculum or students' interests. Each time the survey was administered to students, the principal investigator briefly reviewed the informed consent (Appendix B) with the participants. The principal investigator explained the purpose of the study, the participants' task, and the time required. Participants were informed of the confidentiality of the survey, as their names would not be associated with their answers. Instead, surveys were assigned a code

number for the purposes of double checking data entry. They were made aware that their surveys would be locked in the principal investigator's desk as a precaution to keep the data confidential. Participants were informed that the survey would in no way impact their grade, as the professor would not see students' individual survey answers. Participants were told that the survey was voluntary, that they could withdraw from the study at any time, and that they did not have to answer questions that they did not want to answer. Copies of the informed consent were made available to everyone, which included the contact information of the principal investigator, the principal investigator's committee, and the Institutional Review Board. Most students completed the survey in about 15 minutes.

Analyzing the Data

"Rather than being viewed as a straitjacket allowing no further movement, prespecified analysis plans should be viewed as a framework to ensure scientific discipline" –(Belin & Normand, 2009)

Statistical Tests

The data will be analyzed using ANCOVAs, correlations, and multiple regressions, as appropriate for each hypothesis. The analysis of variance (ANOVA), also referred to as an F test, measures the difference between two or more (usually multiple) means (Agresti & Finlay, 2009; Pyrczak, 2004). The ANOVA tests for independence between a quantitative outcome (dependent) variable and a categorical predictor (independent) variable (Agresti & Finlay, 2009). An analysis of covariance (ANCOVA) test is a similar to the ANOVA, however the ANCOVA will control for other continuous variables that may differ between the groups (the covariates), as they may predict the outcome (dependent) variable (Leech, Barrett, & Morgan, 2008). The ANCOVA identifies the variance that may result from covariates by computing a regression analysis in each cell

(StatSoft Inc., 2011). Through this process, the variance resulting from the covariance is separated out (StatSoft Inc., 2011). Thus, the ANCOVA strengthens the statistical power of an analysis (Colliver & Markwell, 2006) by controlling for some variables and therefore explaining variability in the variables of interest (StatSoft Inc., 2011). The ANCOVA can be used to remove bias effects in observational studies, to fit regressions in multiple classification variables, and to analyze data when some observations are missing (Belin & Normand, 2009; Cochran, 1957).

A correlation measures the strength of association between two variables, with -1 representing a perfect negative correlation, +1 representing a perfect positive relationship, and 0 representing no relationship at all. Multiple correlation identifies the relationship between two or more independent variables and one dependent variable (Pyrczak, 2004). Correlation can show a relationship between two variables, however it cannot show causation (Pyrczak, 2004).

Multiple linear regression predicts the linear relationship between multiple independent variables and one dependent variable (Agresti & Finlay, 2009). Multiple independent variables in a statistical model will better predict a dependent variable than one independent variable alone (Agresti & Finlay, 2009). Multivariate models are able to control for certain variables, allowing for interpretation of the relationship between the variables of interest (Agresti & Finlay, 2009). As a result, multiple linear regression is helpful for finding correlation between variables in non-experimental studies (Field, 2008). Since multiple linear regression shows correlation – as opposed to causation – it is very useful for correlational studies which observe variables that were collected at

one point in time (Field, 2008). It is assumed that variables in this type of study are not manipulated by an intervention (Field, 2008).

Analysis of Hypotheses

Hypothesis 1

H1: Knowledge of developmentally appropriate care with children in the health care setting will not vary by field (Perrin & Perrin, 1983; Vacik et al., 2001), nor will students' intent to work with children in their career (Blum & Bearinger, 1990; Boreman et al., 2007; Tanner et al., 2009).

To analyze Hypothesis 1, ANCOVAs were be used. Knowledge of developmentally appropriate care with children in the health care setting was the dependent variable for the first ANCOVA, and students' field of study (nursing, medical, physician assistant, physical therapist, or non-clinical health care professionals) was the independent variable. The covariates were race, gender and age. The race variable was dichotomized to represent two groups: White and non-White. The second ANCOVA was parallel to the first one, using a different independent variable: students' intent to work with children in their career. Covariates were race, gender and age.

Hypothesis 2

H2: Students with more patient-centered views, and who have more personal and professional experience with children (Abela, 2009; Bandura, 1977; Kaufman, 2003), will have more knowledge of developmentally appropriate care with children in the health care setting. Demographic characteristics, having a course in child development or seminar on DAP, and confidence will not significantly predict knowledge (Perrin & Perrin, 1983; Vacik et al., 2001).

To analyze Hypothesis 2, multiple linear regressions were used with knowledge of developmentally appropriate care with children in the health care setting as the dependent variable. Independent variables were personal experience, professional experience, course in child development, seminar on DAP, confidence in working with

children in the health care setting and patient-practitioner orientation. Covariates were race, gender and age.

Hypothesis 3

H3: This hypothesis explores how students' knowledge, confidence, experience, intent to work with children, and demographic characteristics are associated with interest in future training on DAC with children in the health care setting. It is exploratory in nature, and for that reason a specific hypothesis will not be formed by previous research.

To analyze Hypothesis 3, ANCOVAs and a correlation were used. For the first ANCOVA, the dependent variable was interest in future training on developmentally appropriate care with children in the health care setting. The independent variable was field of study (nursing, medical, physician assistant, physical therapist, or non-clinical health care professionals). Covariates were race, gender and age. The second ANCOVA was parallel to the first one, using a different independent variable: students' intent to work with children in their career. Covariates were race, gender and age. Finally, a correlation was run with the following variables: age, interest on future training, knowledge and confidence in working with children in the health care setting, personal experience, professional experience, course in child development, seminar on DAP and patient-practitioner orientation.

CHAPTER 4
RESULTS

Sample Statistics

Surveys were completed by 705 graduate and undergraduate students. Twenty-six students did not meet the criteria of planning to work in the health care field or being enrolled in the program that qualifies them to work in the health care field, and 30 surveys were missing too much data (several items and/or multiple scales) to use for analysis (3 paper surveys, 27 online surveys). After removing unusable surveys, 649 participant surveys (N = 649) remained for data analysis. Of the 649 participants who completed usable surveys (Table 4-1), 481 (74.2%) were female and 167 (25.7%) were male. The sample's age ranged from 19 – 55, with a mean of 25.1 (SD = 5.06). Of those who indicated their race, 466 (74.2%) were White/non-Hispanic, 75 (11.6%) were Asian/Pacific Islander, 45 (7.0%) were Hispanic/Latino, 33 (5.1%) were Black/non-Hispanic, 19 (2.9%) were Multi-racial, and 8 (1.2%) indicated Other. The race variable was dichotomized into White-non-Hispanic/not White/non-Hispanic for the analyses, since most of the participants were White/non-Hispanic. Five fields of study were represented in the sample, including 200 (30.8%) medical students, 197 (30.4%) nursing students,112 (17.3%) physician assistant students, 86 (13.3%) non-clinical health care students and 54 (8.3%) physical therapy students. The only undergraduates included in the sample were nursing students, all others were graduate students. The entire sample contained 501 (77.4%) graduate students and 147 (22.7%) undergraduate students.

For Hypothesis 2, the students were analyzed by field of study. In the nursing student sample (Table 4-2), 190 (96.4%) were female and 7 (3.6%) were male. Of those

who indicated their race, 152 (77.2%) were White/non-Hispanic, 17 (8.6%) were Hispanic/Latino, 12 (6.1%) were Asian/Pacific Islander, 11 (5.6%) were Black/non-Hispanic, and 5 (2.5%) were Multi-racial. Forty-nine nursing students were graduate students and 146 were undergraduate. The mean age was 24.2 with a standard deviation of 7.42.

In the medical student sample (Table 4-2), 102 (51.3%) were female and 97 (48.7%) were male. Of those who indicated their race, 121 (61.1%) were White/non-Hispanic, 38 (19.2%) were Asian/Pacific Islander, 14 (7.1%) were Black/non-Hispanic, 12 (6.1%) were Hispanic/Latino, 8 (4.0%) were Multi-racial and 5 (2.5%) were Other/ The mean age was 24.5 with a standard deviation of 1.94.

In the physician assistant student sample (Table 4-2), 94 (83.9%) were female and 18 (16.1%) were male. Of those who indicated their race, 99 (88.4%) were White/non-Hispanic, 6 (5.4%) were Asian/Pacific Islander, 6 (5.4%) were Hispanic/Latino, and 1 (0.9%) was Black/non-Hispanic. The mean age was 26.3 with a standard deviation of 3.65.

In the physical therapy student sample (Table 4-2), 38 (70.4%) were female and 16 (29.6%) were male. Of those who indicated their race, 42 (77.8%) were White/non-Hispanic, 8 (14.8%) were Asian/Pacific Islander, 3 (5.6%) were Hispanic/Latino, and 1 (1.9%) was Other. The mean age was 26.4 with a standard deviation of 4.40.

In the non-clinical health care student sample (Table 4-2), 57 (66.3%) were female and 29 (33.7%) were male. Of those who indicated their race, 52 (61.2%) were White/non-Hispanic, 11 (12.9%) were Asian/Pacific Islander, 7 (8.2%) were

Hispanic/Latino, 7 (8.2%) were Black/non-Hispanic, 6 (7.1%) were Multi-racial, and 2 (2.4%) were Other. The mean age was 26.1 with a standard deviation of 4.95.

Hypothesis 1

RQ1: How does knowledge of developmentally appropriate care with children and intent to work with children in the health care setting vary between the observed fields of study?

H1: Knowledge of developmentally appropriate care with children in the health care setting will not vary by field (Perrin & Perrin, 1983; Vacik et al., 2001), nor will students' intent to work with children in their career (Blum & Bearinger, 1990; Boreman et al., 2007; Tanner et al., 2009).

Knowledge of DAC by Field of Study

An analysis of covariance was used to assess whether or not knowledge of DAC varied by field of study after controlling for race, gender and age. Table 4-3 presents the means and standard deviations for knowledge of DAC by field of study. Results of the ANCOVA presented in Table 4-4 indicate that after controlling for race, gender and age, knowledge of DAC was significantly different between the observed fields of study, F (1, 634) = 4.32, p = .002. This contrasts with the proposed hypothesis that knowledge of DAC would not vary by field. Non-clinical health care students appear to have less knowledge of DAC than students in nursing, medical, physician assistant and physical therapy programs.

Post-hoc analysis: knowledge of DAC by field of study

A post-hoc analysis revealed that non-clinical health care students scored significantly lower than nursing ($p < .001$), medical ($p = .001$), physician assistant ($p = .005$), and physical therapy students ($p = .023$).

Additional analysis: professional experience with children by field of study

Because non-clinical students scored lower on the knowledge items, an analysis was conducted to see if non-clinical health care students had less professional experience with children in the health care setting, a post-hoc analysis of covariance was used to assess whether or not professional experience with children varied by field of study after controlling for race, gender and age. The means and standard deviations for professional experience with children by field of study were M = 2.38 (SD = .94) for nursing students, M = 2.49 (SD = .77) for medical students, M = 2.53(SD = .81) for physician assistant students, M = 2.25 (SD = .62) for physical therapy students and M = 2.15 (SD = 1.07) for non-clinical health care students. Results indicate that after controlling for race, gender and age, professional experience with children was significantly different between the observed fields of study, F (4, 633) = 2.84, p = .024. Non-clinical health care students had the least amount of experience with children in the professional setting, and physician assistant students had the most.

Additional analysis: knowledge of DAC by clinical fields of study

Because non-clinical students scored lower on the knowledge items, an analysis was conducted only with clinical students to see if this sample's results would align with previous research that clinical health care professionals' knowledge of DAC does not significantly vary by field, a post-hoc analysis of covariance was used to assess whether or not knowledge of DAC varied by field of study among nursing, medical, physician assistant, and physical therapy students after controlling for race, gender and age. Nursing, medical, physician assistant and physical therapy students were included in the analysis. Non-clinical health care students were not included in this analysis. The means and standard deviations for knowledge of DAC by clinical fields of study were: M

= 7.47 (SD = 1.84) for nursing students, M = 7.11 (SD = 1.95) for medical students, M = 7.35 (SD = 1.79) for physician assistant students and M = 7.30 (SD = 1.86) for physical therapy students. Results indicate that after controlling for race, gender and age, knowledge of DAC was not significantly different between clinical (nursing, medical, physician assistant, and physical therapy) fields of study, F (3, 551) = .56, p = .644.

Knowledge of DAC by Intent to Work with Children

An analysis of covariance was used to assess whether or not knowledge of DAC varied by students' intent to work with children after controlling for race, gender and age. Table 4-5 presents the means and standard deviations for knowledge of DAC by students who plan to work with children, and those who do not. As hypothesized, results presented in Table 4-6 indicates that after controlling for race, gender and age, knowledge of DAC was not significantly different between students who plan to work with children and those who do not plan to work with children F (1, 631) = .18, p = .676.

Additional analysis: professional experience with children by intent to work with children

Because students knowledge did not vary among students who intend to work with children and those who intend to work with children, an analysis was conducted to see if students who intend to work with children were engaged in more professional experience with children, a post-hoc analysis of covariance was used to assess whether or not professional experience with children varied by students who intend to work with children and those who do not after controlling for race, gender and age. The means and standard deviations for professional experience with children by intent to work with children were M = 2.07 (SD = .81) for those who do not intend to work with children, and M = 2.57 (SD = .855) for those who do intend to work with children. Results indicate that

after controlling for race, gender and age, professional experience was significantly different between the two groups, F (1, 630) = 56.67, $p < .001$; with students who intend to work with children having significantly more professional experience with children than those who do not plan to work with children.

Hypothesis 2

RQ2: To what extent do confidence, experience, and patient-practitioner orientation predict students' knowledge of developmentally appropriate care with children in the health care setting within the observed fields of study?

H2: Students with more patient-centered views, and who have more personal and professional experience with children (Abela, 2009; Bandura, 1977; Kaufman, 2003), will have more knowledge of developmentally appropriate care with children in the health care setting. Demographic characteristics, having a course in child development or seminar on DAP, and confidence will not significantly predict knowledge (Perrin & Perrin, 1983; Vacik et al., 2001).

To answer Hypothesis 2, separate regression analyses were run to see which variables predict knowledge of DAC within each field. A regression was run for each field to avoid utilizing confusing dummy variables to code for field of study in one regression with each field. Knowledge of DAC was the dependent variable, and personal and professional experience with children, educational experience (course in child development or seminar on DAC), confidence in providing DAC, and patient-practitioner orientation were independent variables. Race, gender and age were covariates.

Nursing Students: Variables that Predict Knowledge of DAC

Demographic variables of the nursing student sample are presented in Table 4-2. The means and standard deviations for knowledge of DAC within the nursing student sample and predictor variables are presented in Table 4-7. The intercorrelations for nursing students' knowledge of DAC and predictor variables are presented in Table 4-8.

Results from the regression analysis for the nursing student sample (Table 4-9) indicate that nursing students' knowledge of DAC was predicted by age (β = .24, *p* = .002) and patient-practitioner orientation (β = .22, p = .003). Specifically, as age and patient-centeredness increased, knowledge of DAC among nursing students also increased.

Medical Students: Variables that Predict Knowledge of DAC

Demographic variables of the medical student sample are presented in Table 4-2. The means and standard deviations for knowledge of DAC within the medical student sample and predictor variables are presented in Table 4-10. The intercorrelations for medical students' knowledge of DAC and predictor variables are presented in Table 4-11.

Results from the regression analysis for the medical student sample (Table 4-12) indicate that medical students' knowledge of DAC was significantly predicted by patient-practitioner orientation (β = .20, *p* = .009). Medical students who were more patient-centered had more knowledge of DAC.

Physician Assistant Students: Variables that Predict Knowledge of DAC

Demographic variables of the physician assistant student sample are presented in Table 4-2. The means and standard deviations for knowledge of DAC within the physician assistant student sample and predictor variables are presented in Table 4-13. The intercorrelations for physician assistant students' knowledge of DAC and predictor variables are presented in Table 4-14.

Results from the regression analysis for the physician assistant sample (Table 4-15) indicate that physician assistant students' knowledge of DAC was not significantly predicted by any of the variables in the model.

Physical Therapy Students: Variables that Predict Knowledge of DAC

Demographic variables of the physical therapy student sample are presented in Table 4-2. The means and standard deviations for knowledge of DAC within the physical therapy student sample and predictor variables are presented in Table 4-16. The intercorrelations for physical therapy students' knowledge of DAC and predictor variables are presented in Table 4-17.

Results from the regression analysis for the physical therapy sample (Table 4-18) indicate that physical therapy students' knowledge of DAC was significantly predicted by age ($\beta = .39$, $p = .011$). As age increased, so did physical therapy student's knowledge of DAC.

Non-Clinical Health Care Students: Variables that Predict Knowledge of DAC

Demographic variables of the non-clinical health care student sample are presented in Table 4-2. The means and standard deviations for knowledge of DAC within the non-clinical health care student sample and predictor variables are presented in Table 4-19. The intercorrelations for non-clinical health care students' knowledge of DAC and predictor variables are presented in Table 4-20.

Results from the regression analysis for the non-clinical health care student sample (Table 4-21) indicate that non-clinical health care students' knowledge of DAC was significantly predicted by having taken a course in child development ($\beta = .25$, $p = .034$) and patient-practitioner orientation ($\beta = .28$, $p = .017$). Students who had taken a course in child development and who were more patient-centered had more knowledge of DAC.

Summary of Findings for Hypothesis 2

The hypothesis that students with more patient-centered views would be more knowledgeable of DAC held true for nursing students, medical students, and non-clinical health care students. For these groups, the patient-centered views significantly predicted knowledge of DAC with children in the health care setting. As age increased, knowledge of DAC also increased for nursing and physical therapy students. For nursing students, age was significantly (p = .001) correlated with professional experience. Specifically, as age increased, so did professional experience. This was not the case for physical therapy students. Age and personal experience were not significantly correlated for nursing or physical therapy students. For the regressions, personal and professional experience did not significantly predict knowledge of DAC in any of the fields, contrasting with the hypothesized outcome. For non-clinical health care students, a course in child development significantly predicted more knowledge of DAC, contrasting with the hypothesized outcome.

Hypothesis 3

RQ3: How are students' knowledge, confidence, experience, intent to work with children, and demographic characteristics associated with interest in future training on developmentally appropriate care with children in the health care setting?

H3: This hypothesis is exploratory in nature, and for that reason a specific hypothesis will not be formed by previous research.

Interest in Future Training on DAC by Field of Study

An analysis of covariance was used to assess whether or not interest in future training on DAC varied by field of study after controlling for race, gender and age. Table 4-22 presents the means and standard deviations for interest in future training on DAC by field of study. The results in Table 4-23 indicate that after controlling for race, gender

and age, interest in future training on DAC was significantly different between the observed fields of study, F (4, 635) = 2.87, *p* = .023. Physician assistants students were the most interested in future training on DAC.

Post-hoc analysis: interest in future training on DAC by field of study

A post-hoc analysis revealed that physician assistant students were significantly more interested in future training on DAC than nursing students (p = .034) and medical students (*p* = .001).

Interest in Future Training by Intent to Work with Children

An analysis of covariance was used to assess whether or not interest in future training on DAC varied by intent to work with children after controlling for race, gender and age. Table 4-24 presents the means and standard deviations for interest in future training according to students who plan to work with children and those who do not plan to work with children. Results presented in Table 4-25 indicate that after controlling for race, gender and age, interest in future training on DAC was significantly different between students who plan to work with children, and those who do not plan to work with children, F (1, 632) = 53.42, *p* < .001. Students who indicated that they intend to work with children were more interested in future training on DAC.

Variables that Predict Future Health Care Professionals' Interest in Future Training

A Pearson's correlation was computed to assess the variables associated with future health care professionals who are interested in future training on DAC. Variables in the correlation included age, confidence in providing DAC, knowledge of DAC, personal and professional experience with children, educational experiences such as a course in child development or seminar on DAC and patient-practitioner orientation.

Results from this analysis presented in Table 4-26 indicate that interest was significantly associated with age (r = -.09, *p* = .026), confidence in providing DAC (r = .18, *p* < .001), personal experience with children (r = -.19, p < .001), and professional experience with children (r = -.16, *p* < .001), having taken a course in child development (r = -.11, *p* = .007), and patient-practitioner orientation (r = -.08, *p* = .048). Specifically, students who were younger, more confident in their ability to provide DAC, had more personal and professional experience with children, had taken a course in child development, and who were more patient-centered were more interested in future training on DAC with children in the health care setting.

Table 4-1. Characteristics of Students in the Overall Sample

	Frequency	Percent	Mean	Standard Deviation
Field of Study				
Nursing	197	30.4		
Medical	200	30.8		
Physician Assistant	112	17.3		
Physical Therapy	54	8.3		
Non-Clinical Health Care	86	13.3		
Gender				
Female	481	74.2		
Male	167	25.8		
Race				
White/non-Hispanic	466	72.1		
Black/non-Hispanic	33	5.1		
Hispanic/Latino	45	7.0		
Asian/Pacific Islander	75	11.6		
Native American	0	0.0		
Multi-racial	19	2.9		
Other	8	1.2		
Graduate/Undergraduate				
Graduate	501	77.3		
Undergraduate	147	22.7		
Age			25.1	5.06

Table 4-2. Characteristics of Student Samples by Field of Study

	Nursing	Medical	Physician Assistant	Physical Therapy	Non-Clinical Health Care
Gender					
Female	190 (96.4)	102 (51.3)	94 (83.9)	38 (70.4)	57 (66.3)
Male	7 (3.6)	97 (48.7)	18 (16.1)	16 (29.6)	29 (33.7)
Race					
White/non-Hispanic	152 (77.2)	121 (61.1)	99 (88.4)	42 (77.8)	52 (61.2)
Black/non-Hispanic	11 (5.6)	14 (7.1)	1 (.9)	0 (0.0)	7 (8.2)
Hispanic/Latino	17 (8.6)	12 (6.1)	6 (5.4)	3 (5.6)	7 (8.2)
Asian/Pacific Islander	12 (6.1)	38 (19.2)	6 (5.4)	8 (14.8)	11 (12.9)
Multi-racial	5 (2.5)	8 (4.0)	0 (0.0)	0 (0.0)	6 (7.1)
Other	0 (0.0)	5 (2.5)	0 (0.0)	1 (1.9)	2 (2.4)
Year in Program					
Graduate					
1st Year	23 (46.9)	74 (37.2)	54 (48.2)		41 (47.7)
2nd Year	15 (30.6)	50 (25.1)	58 (51.8)		32 (37.2)
3rd Year	3 (6.1)	6 (3.0)		54 (100.0)	9 (10.5)
4th Year	1 (2.0)	69 (34.7)			
Other	7 (14.3)				
Undergraduate					
1st Year	131 (89.7)				
2nd Year	15 (10.3)				
Age	M = 24.2 SD = 7.42	M = 24.5 SD = 1.94	M = 26.3 SD = 3.65	M = 26.4 SD = 4.40	M = 26.1 SD = 4.95

Table 4-3. Knowledge of DAC mean scores and standard deviations as a function of field of study

Source	M	SD
Nursing Students	7.47	1.84
Medical Students	7.11	1.95
Physician Assistant Students	7.35	1.79
Physical Therapy Students	7.26	1.86
Non-clinical Students	6.43	2.04
Total	7.18	1.92

Table 4-4. Analysis of covariance for knowledge of DAC as a function of field of study, with race, gender and age as covariates

Source	df	SS	MS	F
Race	1	8.80	8.80	2.54
Gender	1	12.30	12.30	3.55
Age	1	70.00	70.00	20.20***
Field of Study	4	59.85	14.96	4.32**
Error	634	2196.89	3.47	
Total	642	35488.00		
Corrected Total	641	2356.31		

*p < .05. **p < .01. ***p < .001.

Table 4-5. Knowledge of DAC mean scores and standard deviations as a function of intent to work with children

Source	M	SD
No	7.14	1.96
Yes	7.23	1.90
Total	7.19	1.92

Table 4-6. Analysis of covariance for knowledge as a function of intent to work with children, with race, gender and age as covariates

Source	df	SS	MS	F
Race	1	14.21	14.21	3.99*
Gender	1	21.81	21.81	6.12**
Age	1	58.67	58.67	16.47***
Intent to Work w/Children	1	.62	.62	.18
Error	631	2248.17	3.56	
Total	636	35229.00		
Corrected Total	635	2347.98		

*p < .05. **p < .01. ***p < .001.

Table 4-7. Means and standard deviations for knowledge of DAC within nursing student sample and predictor variables (N = 191)

Variable	M	SD
Knowledge	7.47	1.85
Personal experience with children	3.42	.74
Professional experience with children	2.40	.94
Course in child development	.91	.29
Seminar or in-service on DAP	.30	.46
Confidence	4.35	.84
Patient-Practitioner Orientation	4.49	.51

Table 4-8. Intercorrelations for nursing students' knowledge of DAC and predictor variables (N = 191)

Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge	--									
2. Race	.19**	--								
3. Gender	- .13*	.03	--							
4. Age	.30***	.16**	.06	--						
5. Personal exp.	.13*	.02	- .02	.08	--					
6. Professional exp.	.12	- .01	- .04	.24***	.31***	--				
7. Course	.09	.05	.06	- .05	.03	.15**	--			
8. Seminar	.01	- .08	.08	.02	.05	.16**	.08	--		
9. Confidence	.00	- .01	- .02	.19**	.21***	.42***	.14*	.23***	--	
10. PPOS	.34***	.24***	-.19**	.25***	.05	- .01	.09	- .11	-.03	--

*p < .05. **p < .01. ***p < .001.

Table 4-9. Regression analysis summary for variables predicting nursing students' knowledge of DAC (N = 191)

Variable	B	SEB	B	95% CI
Race	.45	.30	.10	[-.15, 1.05]
Gender	-1.15	.73	- .11	[-2.58, .29]
Age	.06	.02	.24**	[.02, .09]
Personal exp.	.25	.18	.10	[-.10, .59]
Professional exp.	.10	.15	.05	[-.20, .41]
Course	.55	.45	.08	[-.33, 1.43]
Seminar or in-service	.19	.28	.49	[-.36, .74]
Confidence	- .23	.17	- .10	[-.56, .10]
PPOS	.82	.27	.22**	[.29, 1.35]

*p < .05. **p < .01. ***p < .001.

Table 4-10. Means and standard deviations for knowledge of DAC within medical student sample and predictor variables (N = 190)

Variable	M	SD
Knowledge	7.15	1.94
Personal experience with children	3.04	.81
Professional experience with children	2.39	.77
Course in child development	.37	.49
Seminar or in-service on DAP	.11	.31
Confidence	4.11	.74
Patient-Practitioner Orientation	4.36	.46

Table 4-11. Intercorrelations for medical students' knowledge of DAC and predictor variables (N = 190)

Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge	--									
2. Race	.06	--								
3. Gender	-.07	.08	--							
4. Age	.05	.14*	.14*	--						
5. Personal exp.	-.02	-.04	.01	-.10	--					
6. Professional exp.	-.03	.11	-.04	.19**	.26***	--				
7. Course	-.02	-.06	-.15*	-.08	.18**	.08	--			
8. Seminar	-.03	.10	-.03	.11	.00	.23***	-.02	--		
9. Confidence	-.09	-.01	.05	.13*	.28***	.29***	.21**	.03	--	
10. PPOS	.19**	-.05	-.23***	-.14*	.15*	.09	.05	-.14*	.03	--

*p < .05. **p < .01. ***p < .001.

Table 4-12. Regression analysis summary for variables predicting medical students' knowledge of DAC (N = 190)

Variable	B	SEB	B	95% CI
Race	.25	.29	.06	[-.33, .83]
Gender	-.16	.30	-.04	[-.75, .42]
Age	.10	.08	.10	[-.05, .25]
Personal exp.	.01	.19	.01	[-.36, .39]
Professional exp.	-.13	.21	-.05	[-.53, .28]
Course	.01	.30	.00	[-.59, .61]
Seminar or in-service	-.01	.48	-.00	[-.96, .93]
Confidence	-.24	.21	-.09	[-.65, .17]
PPOS	.86	.33	.20**	[.21, 1.50]

*p < .05. **p < .01. ***p < .001.

Table 4-13. Means and standard deviations for knowledge of DAC within physician assistant students and predictor variables (N = 111)

Variable	M	SD
Knowledge	7.34	1.80
Personal experience with children	3.05	.86
Professional experience with children	2.53	.81
Course in child development	.58	.50
Seminar or in-service on DAP	.06	.24
Confidence	4.75	.64
Patient-Practitioner Orientation	4.39	.43

Table 4-14. Intercorrelations for physician assistant students' knowledge of DAC and predictor variables (N = 111)

Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge	--									
2. Race	.09	--								
3. Gender	-.10	.08	--							
4. Age	.02	.12	.30***	--						
5. Personal exp.	.00	.09	.06	.05	--					
6. Professional exp.	-.01	-.07	.04	.05	.24**	--				
7. Course	-.01	.20**	.03	-.02	.20**	.02	--			
8. Seminar	-.07	-.02	-.01	.19*	.07	.01	.22**	--		
9. Confidence	-.01	-.08	-.07	.03	.37***	.37***	.16*	.00	--	
10. PPOS	.11	-.02	-.13	.06	-.16*	-.08	-.03	.05	.01	--

*p < .05. **p < .01. ***p < .001.

Table 4-15. Regression analysis summary for variables predicting physician assistant students' knowledge of DAC (N = 111)

Variable	B	SEB	B	95% CI
Race	.48	.57	.09	[-.65, 1.61]
Gender	-.54	.51	-.11	[-1.55, .47]
Age	.02	.05	.05	[-.08, .13]
Personal exp.	.05	.23	.03	[-.40, .51]
Professional exp.	.03	.24	.02	[-.44, .51]
Course	-.00	.38	-.00	[-.76, .76]
Seminar or in-service	-.63	.76	-.09	[-2.14, .88]
Confidence	-.08	.32	-.03	[-.71, .55]
PPOS	.41	.42	.10	[-.42, 1.24]

*p < .05. **p < .01. ***p < .001.

Table 4-16. Means and standard deviations for knowledge of DAC within physical therapy student sample and predictor variables (N = 52)

Variable	M	SD
Knowledge	7.31	1.85
Personal experience with children	2.98	.87
Professional experience with children	2.25	.62
Course in child development	.90	.30
Seminar or in-service on DAP	.10	.30
Confidence	4.42	.53
Patient-Practitioner Orientation	4.54	.38

Table 4-17. Intercorrelations for physical therapy students' knowledge of DAC and predictor variables (N = 52)

Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge	--									
2. Race	-.09	--								
3. Gender	.09	-.37**	--							
4. Age	.37**	-.04	.24*	--						
5. Personal exp.	-.11	.21	-.03	.17	--					
6. Professional exp.	.00	-.17	.07	-.05	.26*	--				
7. Course	.23*	-.17	-.07	.05	-.08	.03	--			
8. Seminar	-.09	-.31**	.07	.12	.16	.19	.11	--		
9. Confidence	-.07	.02	-.18	.16	.12	.30**	.08	.25*	--	
10. PPOS	.26*	.21	-.06	.22*	.03	-.30**	-.00	.03	-.04	--

*p < .05. **p < .01. ***p < .001.

Table 4-18. Regression analysis summary for variables predicting physical therapy students' knowledge of DAC (N = 52)

Variable	B	SEB	B	95% CI
Race	-.42	.72	-.09	[-1.86, 1.03]
Gender	-.15	.59	-.04	[-1.34, 1.05]
Age	.16	.06	.39**	[.04, .28]
Personal exp.	-.32	.31	-.15	[-.94, .30]
Professional exp.	.56	.45	.19	[-.35, 1.47]
Course	1.30	.83	.21	[-.36, 2.97]
Seminar or in-service	-1.04	.91	-.17	[-2.87, .79]
Confidence	-.50	.51	-.14	[-1.53, .53]
PPOS	1.23	.69	.26	[-.15, 2.61]

*p < .05. **p < .01. ***p < .001.

Table 4-19. Means and standard deviations for knowledge of DAC within non-clinical health care student sample and predictor variables (N = 83)

Medical Students	M	SD
Knowledge	6.42	2.05
Personal experience with children	3.11	.95
Professional experience with children	2.16	1.08
Course in child development	.51	.50
Seminar or in-service on DAP	.12	.33
Confidence	4.29	.83
Patient-Practitioner Orientation	4.41	.51

Table 4-20. Intercorrelations for non-clinical health care students' knowledge of DAC and predictor variables (N = 83)

Variable	1	2	3	4	5	6	7	8	9	10
1. Knowledge	--									
2. Race	-.02	--								
3. Gender	.03	-.01	--							
4. Age	.06	.10	.26**	--						
5. Personal exp.	.04	.01	-.08	.01	--					
6. Professional exp.	.14	-.12	-.27**	-.10	.50***	--				
7. Course	.32***	.01	-.06	-.09	.09	.33***	--			
8. Seminar	-.06	-.16	.13	-.04	.08	.12	.07	--		
9. Confidence	-.06	-.22*	.04	-.18*	.38**	.35***	-.05	.16	--	
10. PPOS	.29**	.20*	-.30**	.02	.08	.12	.19*	-.13	-.01	--

*p < .05. **p < .01. ***p < .001.

Table 4-21. Regression analysis summary for variables predicting non-clinical health care students' knowledge of DAC (N = 83)

Variable	B	SEB	B	95% CI
Race	-.41	.47	-.10	[-1.34, .53]
Gender	.66	.52	.15	[-.39, 1.70]
Age	.02	.05	.04	[-.08, .11]
Personal exp.	-.01	.27	-.00	[-.55, .54]
Professional exp.	.19	.27	.10	[-.34, .72]
Course	1.02	.47	.25*	[.08, 1.97]
Seminar or in-service	-.43	.69	-.07	[-1.80, .94]
Confidence	.22	.31	-.09	[-.84, .40]
PPOS	1.13	.46	.28**	[.21, 2.05]

*p < .05. **p < .01. ***p < .001.

Table 4-22. Interest in future training on DAC mean scores and standard deviations as a function of field of study

Source	M	SD
Nursing Students	2.99	.63
Medical Students	2.79	.71
Physician Assistant Students	3.09	.58
Physical Therapy Students	2.92	.60
Non-clinical Students	2.95	.67
Total	2.93	.66

Table 4-23. Analysis of covariance of interest in future training as a function of field of study, with race, gender and age as covariates

Source	df	SS	MS	F
Race	1	2.25	2.25	5.51**
Gender	1	5.84	5.84	14.32***
Age	1	1.44	1.44	3.53
Field of Study	4	4.67	1.17	2.87*
Error	635	258.82	.41	
Total	643	5814.87		
Corrected Total	642	276.93		

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4-24. Interest in future training mean scores and standard deviations as a function of intent to work with children

Source	M	SD
No	2.70	.62
Yes	3.09	.63
Total	2.94	.66

Table 4-25. Analysis of covariance of interest in future training as a function of intent to work with children, with race, gender and age as covariates

Source	df	SS	MS	F
Race	1	2.02	2.02	5.29*
Gender	1	7.01	7.01	18.38***
Age	1	.36	.36	.94
Intent to Work w/Children	1	20.37	20.37	53.42***
Error	632	241.03	.38	
Total	637	5763.73		
Corrected Total	636	274.73		

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 4-26. Intercorrelations for interest in future training and variables of interest

Variable	1	2	3	4	5	6	7	8	9
1.Interest	--								
2. Age	-.09*	--							
3. Confidence	.18***	.12**	--						
4. Knowledge	.00	.16***	-.02	--					
5. Personal exp.	.19***	.02	.26***	.05	--				
6. Professional exp.	.16***	.12**	.35***	.07	.31***	--			
7. Course	.11**	-.05	.16***	.11**	.18***	.12**	--		
8. Seminar	.01	.00	.13***	.01	.09*	.13***	.16***	--	
9. PPOS	.08*	.13***	-.01	.25***	.06	.00	.11**	-.07	--

*$p < .05$. **$p < .01$. ***$p < .001$.

CHAPTER 5
DISCUSSION

Discussion of Key Findings

Hypothesis 1

Hypothesis 1 predicted that knowledge of DAC with children in the health care setting would not vary by field of study or health care students' intent to work with children in their career. However, future health care professionals' field of study was significant in predicting knowledge of DAC. A post-hoc analysis revealed that non-clinical health care students had significantly less knowledge of DAC than nursing, medical, physician assistant, and physical therapy students. Means for knowledge of DAC by field indicate that clinical health care professionals were answering 55 – 57% of DAC items correctly, and that non-clinical health care students were only answering 49% of DAC items correctly. Overall, it seems that there is much room to grow with all health care professionals' knowledge of DAC with children in the health care setting. Non-clinical health care students may not have direct exposure to the clinical setting, which may result in having less of a framework for answering the knowledge items on the questionnaire. Additional analyses revealed that professional experience with children does significantly vary by field of study. Non-clinical health care professionals had the least amount of professional experience with children, which may be a contributing factor to non-clinical health care professionals' lower knowledge of DAC.

This study's sample population and measurement are unique, and therefore it is challenging to support these results with previous research. Comparable studies were interested in health care professionals' and students' understanding of children's concepts of illness (Perrin & Perrin, 1983; Vacik et al., 2001); and they found that

knowledge was similar across fields. However, their studies did not include non-clinical health care students. The inclusion of non-clinical health care students contributes an interesting finding that clinical health care students know significantly more than non-clinical health care students. Additional analyses showed that when clinical (nursing, medical physician assistant, and physical therapy) students were analyzed without the inclusion of non-clinical health care students, knowledge of DAC did not significantly vary by field. This supports previous research that knowledge of DAC does not vary among future clinical health care professionals.

Knowledge of DAC did not vary by intent to work with children. Additional analyses conveyed that students who intend to work with children did have more professional experience with children; however, these experiences did not seem to translate into more knowledge of DAC. This would suggest that despite students' efforts to gain more professional experience with children, these experiences are not helping future health care professionals learn more about how to provide developmentally appropriate care in the health care setting. While it may be argued this education will take place in residency, research has found that this has not always been effective. Students who go into pediatrics and primary care often feel that their training does not prepare them to understand their patients' developmental needs (Blum & Bearinger, 1990; Boreman et al., 2007; Hafferty, 1998; Levetown & the Committee on Bioethics, 2008; Levinson et al., 2010; H. Schmidt, 1998; Tanner et al., 2009).

Hypothesis 2

Hypothesis 2 predicted that within the observed fields of study, students with more patient-centered views and those who have more personal and professional experience with children would have more knowledge of DAC with children in the health care

setting. It was also predicted that demographic characteristics, having a course in child development or seminar on DAP, and confidence would *not* significantly predict knowledge. This study presents evidence that for nursing students, medical students, and non-clinical health care professionals, individuals who were more patient-centered also had more knowledge of DAC. This may indicate that individuals who take the time to share information with their patients, balance power and control in the relationship, and value their patients' feelings, needs, and personal circumstances (Haidet et al., 2001; E. Krupat et al., 2000), are also more aware of their patients' developmental needs and can respond appropriately. Additionally, students who are more patient-centered may take more of an interest in meeting their patients' personal needs, and as a result have either studied or taken the time to learn how DAC can be provided.

As age increased, knowledge of DAC also increased in nursing and physical therapy students. Results from the nursing regression suggest that as nursing students' age increased, so did their professional experience. However, personal experience was significantly correlated with age for nursing or physical therapy students, and professional experience was not significantly correlated with age for physical therapy students. Thus, even though older nursing and physical therapy students may seem to have more knowledge of DAC as a result of more personal and professional experience with children than their younger colleagues, this study's results do not consistently support this notion. Additionally, the regressions measuring knowledge of DAC within the observed fields of study conveyed that personal and professional experience did not significantly predict knowledge of DAC in any of the fields, contrasting with the hypothesized outcome. This may convey a weakness in the measurement power of the

experience variables. The experience variables may have been too vague by only having the students' convey how much personal and professional experience they'd had with children on a likert scale from 1 (none) to 4 (a lot). These items did not convey whether or not these experiences were parenting, working at a camp, volunteering with children, internships, or working at a hospital. A more comprehensive scale measuring specific experiences might be more effective in measuring this variable in the future.

For non-clinical health care students, a course in child development significantly predicted more knowledge of DAC, contrasting with the hypothesized outcome. Since non-clinical health care students lack exposure to the clinical setting in their curriculum, a course in child development seems to have better-prepared them for understanding children's needs in the health care setting.

Interestingly, none of the variables were significant predictors for physician assistant students' knowledge of DAC, which suggests that there was not a relationship between their knowledge of DAC and the variables measured in this study. Further research with this population may provide further conclusions.

Hypothesis 3

Hypothesis 3 was exploratory in nature, seeking to understand how students' knowledge, confidence, experience, intent to work with children, and demographic characteristics were associated with interest in future training on DAC with children in the health care setting. Interest in future training on DAC with children in the health care setting did significantly vary by field. A post-hoc analysis revealed that physician assistant students were significantly more interested in future training on DAC than nursing and medical students. This suggests that even though this study did not identify which variables predict physician assistants' knowledge of DAC, they are indeed

interested in learning how to provide DAC. It would appear that physician assistants seem to take more of an interest in learning about DAC with children in the health care setting than the other fields.

Students who intend to work with children were significantly more interested in future training on DAC with children in the health care setting. Additionally, students who were younger, more confident in their ability to provide DAC, had more personal and professional experience with children, had taken a course in child development, and who were more patient-centered, were more interested in future training on DAC with children in the health care setting.

Implications for Practice

According to this study, future health care professionals were only able to accurately answer about half of the items correctly relating to knowledge of DAC with children in the health care setting. However, future health care professionals do desire to learn about DAC. Thus, it is important to provide opportunities for in-service training, health care curriculum courses, and experience-based trainings on how to provide developmentally appropriate care. Some topics for these trainings may include learning techniques to reduce pain children experience from procedures and how to consider patients' and families' psychosocial needs.

Further studies should be done to address non-clinical health care professionals' knowledge, confidence, and interest in further training on developmentally appropriate care with children in the health care setting. It is important to include them in this research as they will influence the clinical aspects of health care through teaching, research, and policy. For example, the field of public health is encouraged to consider children's developmental needs for effective program implementation and

epidemiological research (Avan & Kirkwood, 2010). Similarly, hospital administrators may not directly communicate with children in the clinical setting, but they ought to be knowledgeable of children's needs. This will help inform budgetary and staffing decisions, such as creating child life positions, providing training opportunities for DAC with children in the health care setting, and aligning incentives for medical teams that consider their patients' psychosocial and developmental needs. This research found that non-clinical health care students were the least knowledgeable of DAC among the health care student samples, and that a course in child development was significantly correlated with their knowledge of DAC.

Training on DAC with children in the health care setting may be best targeted toward health care students who plan to work with children, as these students are more interested in training on DAC and appear to have room for improvement in their understanding of DAC. Students may also benefit from learning how to be patient-centered, as this strongly predicts knowledge of DAC with children in the health care setting among nursing, medical, and non-clinical health care students. Physician assistants were the most interested in training on DAC. Individuals facilitating training might benefit from knowing that health care students who are younger, have more confidence in their ability to provide DAC, have more personal and professional experience with children, have taken a course in child development, and who are more patient-centered seem to be the most interested in future training on DAC with children in the health care setting. These individuals may be invested in learning more about DAC and may be helpful in arranging and attending in-service or seminar opportunities to learn more about providing DAC. These individuals may also help champion new

concepts and ideas to help translate DAC into practice. For example, they may be most supportive of introducing a parental presence for induction (PPI) program to the pre-surgery unit or help in advocating for a more child-friendly play room.

According to Adult Learning Theory, training should be directly applicable to students' professions, relate to students' experiences and involve problem-centered approaches to learning (Abela, 2009; Kaufman, 2003). Additionally, though a class in child development was significantly related to non-clinical health care students' knowledge of DAC, Hafferty (1998) recommends going beyond improving the formal curriculum (courses and clinical experience), to also considering the informal curriculum (the interpersonal educational interactions between the professors and students), and the hidden curriculum (organizational and cultural influences). The same philosophy might be an excellent foundation for improving knowledge and practice of DAC in nursing, medical, physician assistant, physical therapy and non-clinical health care programs. In addition to offering an elective on developmentally appropriate care with children in the health care setting, professors might convey the importance of developmentally appropriate care through examples in lecture and modeling developmentally appropriate care during clinical rotations. Additionally, students learn the importance of providing DAC through organizational and cultural influences, such as the program's mission statement or professional attitudes towards providing DAC. Thus, training should not be limited to in-services and courses. Developmentally appropriate care with children should be modeled by students' mentors and supervisors. Feedback should be given to health care students on their interactions with children, including positive feedback and a discussion on areas of improvement.

To convey the importance of humanism in medicine, Indiana University's School of Medicine has incorporated a rotation for medical students to have direct experience with the psychosocial aspects of patients in the clinical setting (Sexton & Massey, 2011). Medical students can observe procedural preparation and support, medical play, and can engage with children in the hospital under the observation of child life specialists at Riley Hospital for Children. During their bedside visits and playroom activities, medical students learn more about what it is like for children to be hospitalized and experience an illness. The Pediatric Clerkship Director, Assistant Clerkship Director, Chief Medical Officer, Clinical Director, medical students, and child life specialists had very positive feedback about the program. Medical students reflected upon their experience, noting that they learned about child life, family-centered care, humanism, resiliency and self-awareness.

For professionals already in the field, Levetown and the Committee on Bioethics (2008) note that it is difficult to engage physicians in further training due to lack of time and monetary reward for doing so. As a result, appropriate incentives should be aligned to help health care professionals see the value in such training. For some health care professionals, external motivation such as a fun name badge clip or their name posted to a "kudos" board may be an incentive. These incentives should be created with the staff's interest and the clinical budget in mind. Additionally, training should be an appropriate length and at a time that the staff can attend (e.g. a lunch-and-learn or at the beginning or end of the day when health care professionals are not seeing patients). Some programs have found a one-hour training to be successful in improving pediatric pain management in their practice (Schechter et al., 2010).

Study Limitations

This study does have limitations. First, the cross-sectional design of this study makes only one observation, limiting the time dimension of the data (de Vaus, 2005). As a result, outside influences on the participants, such as having a bad day or not being focused, could influence their answers on the survey. Some studies overcome this limitation by using a repeated cross-sectional design. This method would survey different, but comparable, students in these colleges (as opposed to the same students over and over again) at different points in time (de Vaus, 2005).

Additionally, the methods used to analyze the hypothesis were powerful for presenting correlations and relationships, but not for presenting causation. For example, it would be interesting to know whether or not a class on child development leads to more knowledge of developmentally appropriate care with children in the health care setting, or whether or not patient-centeredness leads to DAC, or if DAC leads to patient-centeredness.

Another limitation of this study is that not all of the items on the instrument have been validated. The items measuring knowledge of DAC, confidence in providing DAC, and interest in future training on DAC were considered to be strong, as much of the terminology and content is informed by the Child Life Council's certifying exam for child life specialists and from the Child Life Council's core competencies. However, other than the Patient-Practitioner Orientation Scale, most of the items have not been tested for validity and reliability. Also, as mentioned in previous chapters, items were modified from their original phrasing on the Child Life Council Professional Certifying exam. This was to improve clarity and understanding for individuals in fields of study other than child development, while still measuring the same concept.

Also, despite the large number of students in this sample, this study is not generalizable to all nursing, medical, physician assistant, physical therapy, and non-clinical health care students. This data was collected from one university, so results may differ if implemented at other universities due to variances in curriculum and learning opportunities.

Further, the knowledge scores for this instrument did not have a large range. In general, students performed poorly. As a result, this is a limitation in this study's ability to predict knowledge because without a sample that performs will on the DAC items, it is difficult to accurately assess which variables predict knowledge.

Additionally, this study utilized self-reporting. When participants self-report, they may rush through the study for various reasons. Participants may also try to appease the principal investigator by answering in favor of this topic (for example, with more interest in further training in DAC). This concept is called social desirability. To try to minimize social desirability, the principal investigator did not discuss her profession and interest in advocacy for children in the health care setting before the participants took the survey.

Finally, there was a small sample size for physical therapy students (n = 53). As a result, more participants ought to be utilized for similar regression analyses (or less variables for the same number of participants).

Recommendations for Future Research

Future researchers that use this instrument might consider updating the instrument with the Child Life Council's revised core competencies that were released after this study was in progress. However, the older competencies informed items for this study's instrument that proved to have excellent reliability for the confidence and interest

scales, so the older Child Life Council competencies should not be ruled out as effective for informing future measures. Also, the Child Life Council has since updated their Child Life Professional Certification Exam items, and future instrument development should consider using the newer items.

Future research should utilize stronger measures of experience, such as a scale with several factors indicating experience that includes personal, professional, and educational experience. As mentioned earlier, the experience variables might also be improved if they helped specify the type of personal and professional experience the participants are referring to (internships, paid experience, parenting, volunteering at a camp, etc.). The experience variables used in this study did not significantly predict knowledge, though it seems intuitive that older students would have more knowledge of DAC as a result of more life experience with children. If this were true, they would have a stronger understanding of children's needs in the health care setting; however, the experience variables did not capture that.

Future research should investigate the relationship between DAC and patient-centered care, whether or not more knowledge of DAC translates into better practice of DAC, and what type of training on DAC is most effective for health care students and professionals.

APPENDIX A
INFORMED CONSENT

Informed Consent

Protocol Title: Developmentally Appropriate Practice with Children in the Hospital Setting

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study: The purpose of this study is to understand health care students' knowledge of developmentally appropriate practice with children in the health care setting and to understand what factors correlate with that knowledge. Results may be published and presented at relevant conferences.

What you will be asked to do in the study: Students in the College of Medicine, College of Nursing, College of Health and Human Performance, and Public Health and Health Professions will be asked to complete a survey responding to items regarding your demographic information, knowledge of developmentally appropriate practice with children in the hospital setting, and items from the patient-provider orientation scale. This survey will be administered at the beginning of class and, in some cases, online. If you take the survey in class, you will not miss class and it will not negatively impact your grades. If you choose not to complete this questionnaire while it is being distributed in class, you can engage in another quiet activity until participants have completed the questionnaire.

Time required: 15-20 minutes

Risks and Benefits: There are no risks involved with this study. We do not anticipate that you will benefit directly by participating in this experiment. You will not be compensated for participating in this study.

Confidentiality: Your identity will not be recorded or associated with your responses. Your information will be assigned a code number. The list connecting your name to this number will be kept in a locked file in the principal investigator's office.

Voluntary participation: Your participation in this study is completely voluntary. There is no penalty for not participating.

Right to withdraw from the study: You have the right to withdraw from the study at anytime without consequence. Further, you do not have to answer any question that you do not wish to answer on this questionnaire.

Whom to contact if you have questions about the study:
Jessica Wente, BS, CCLS, Principal Investigator, Questionnaire Administrator, Graduate Student
Department of Family, Youth and Community Sciences
University of Florida, P.O. BOX 110310, Gainesville, FL, 32611

David Diehl, PhD, Faculty Supervisor, Department of Family, Youth and Community Sciences

Whom to contact about your rights as a research participant in the study:
IRB02 Office, Box 112250, University of Florida, Gainesville, FL 32611-2250

Agreement: I have read the procedure described above. I voluntarily agree to participate in the procedure and I have received a copy of this description.

Participant: _____ Date: _____

Principal Investigator: _____ Date: _____

APPENDIX B
INSTRUMENT: DEVELOPMENTALLY APPROPRIATE PRACTICE WITH CHILDREN IN THE HOSPITAL SETTING

Developmentally Appropriate Practice with Children in the Hospital Setting

Thank you for taking time to complete this questionnaire! Please read instructions for each section carefully and complete to the best of your ability. Each page has a front and back portion to complete.

Part I

This portion of the questionnaire will test your knowledge of developmentally appropriate practice with children in the hospital setting.

These items have been developed using material from a retired Child Life Professional Certification Exam. These items are not representative of each domain that is tested on the exam and many items have been altered for clarity for individuals in fields other than child life. As a result, your performance on this survey is not an accurate assessment of what your performance would be on the Child Life Professional Certification Exam. The Child Life Council has given the principal investigator of this study express permission to use these retired exam items that are protected under copyright law.

Directions: Please circle the answer that you believe to be correct. Throughout the questionnaire, assume the following ages for each developmental stage unless otherwise specified in the question:

Infants (Under 1 year)
Toddlers (1-2)
Preschoolers (3-5)
School-Age (6-11)
Adolescent (12-18)

1. Which of the following is the **GREATEST** stressor for most hospitalized preschool children?
    a. Painful procedures
    b. The hospital environment
    c. Separation from parents
    d. The lack of apparent routines

2. Fundamental to an adolescent's successful coping is maintaining their sense of:
    a. Mastery and control
    b. Physical limitations
    c. Humor
    d. Family support

3. Preparing parents for a child's hospitalization ideally should begin:
    a. During the pre-admission assessment to visit the hospital
    b. Through a private phone call to the parents initiated by a designated pediatric staff member
    c. During a scheduled pre-admission tour which includes the entire family
    d. In the physician's office as soon as the admission is scheduled

4. The **MOST** beneficial play activities for children in health care settings are:
    a. Emotionally charged
    b. Highly structured
    c. Open-ended
    d. Passive

5. Preparation of a preschool child for a medical procedure is **MOST** effective when performed:
    a. Immediately before the procedure
    b. A few hours before the procedure
    c. A few days before the procedure
    d. A few weeks before the procedure

6. Which age group is **MOST** likely to believe that death is reversible?
    a. Infants (Under 1 year)
    b. Toddlers (1-2)
    c. Preschoolers (3-5)
    d. School-Age (6-9)

7. Which of the following will **BEST** facilitate coping in a preschool child who is intubated and in an intensive care unit?
    a. Regular multidisciplinary teaching rounds
    b. Opportunities for dramatic play
    c. Practices that increase environmental predictability
    d. Visitations by volunteers and peers

8. Coping strategies employed by hospitalized children:
    a. Can be acquired, changed, or eliminated through personal experiences
    b. Are innate and stimulated by traumatic events
    c. Have limited value for preschool children
    d. Remain constant from infancy through pre-adolescence

9. The **BEST** method for preventing separation anxiety during a procedure is:
    a. Having the parents present
    b. Having a child life specialist present
    c. Consistently having the same physician perform all procedures
    d. Having the parents leave a transitional object with the child

10. Health care providers who are psychologically preparing a child for health care experiences should first and foremost consider:
    a. Family structure
    b. Developmental level
    c. Medical condition
    d. Personality

11. Which of the following activities would be MOST effective in helping a toddler address the issues of autonomy and separation?
    a. Reading a book on separation
    b. Discussing separation
    c. Playing "hide-and-seek"
    d. Playing "house"

The following questions are not specific to a developmental stage and therefore do not apply to the age ranges listed at the beginning of this subsection. Rather, research on this topic has identified specific age ranges for each topic.

12. The age range of children most vulnerable to psychological upset related to hospitalization is:
    a. Birth to six months
    b. Six months to four years
    c. Five years to eleven years
    d. Twelve years to eighteen years

13. A child is being prepared for a hernia repair. Which age group would MOST likely need to be assured that their condition is not the result of their thoughts or actions?
    a. 1-3 year olds
    b. 3-7 year olds
    c. 7-9 year olds
    d. 9-11 year olds

Part II

Directions: For each of the following items, please circle one answer that you most identify with. Items on this subscale were developed using the Child Life Council's "Child Life Internship Program Self-Review" (http://www.childlife.org/files/InternshipProgramSelfReview.pdf).

I am confident in my ability to…	**Strongly Disagree**	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
effectively explain illness, procedures, surgeries, and medications to toddlers **(1-2)**.	1	2	3	4	5	6
effectively explain illness, procedures, surgeries, and medications to preschoolers **(3-5)**.	1	2	3	4	5	6
effectively explain illness, procedures, surgeries, and medications to school-age children **(6-11)**.	1	2	3	4	5	6
effectively explain illness, procedures, surgeries, and medications to adolescents **(12-18)**.	1	2	3	4	5	6
collaborate with families regarding developmental issues and impact of stressful events.	1	2	3	4	5	6
consider diversity and socio-economic issues of patients and their families.	1	2	3	4	5	6
interact and coordinate with interdisciplinary team members.	1	2	3	4	5	6

Part III

Directions: Please check yes or no in response to the following:

1. Do you plan to work with children in your profession? ☐ Yes ☐ No
2. Have you taken a course in child development? ☐ Yes ☐ No
3. If you have taken a course in child development, how long has it been since you completed the course? (please provide your best estimate in months): _____
4. Have you had a seminar or in-service training on developmentally appropriate practice in the hospital setting? ☐ Yes ☐ No
5. If you have participated in a seminar or in-service training on developmentally appropriate practice in the hospital setting, how long has it been since the seminar or training? (please provide your best estimate in months): _____

Directions: Please circle the answer that you most identify with:

	None	**A little**	**Some**	**A lot**
How much experience have you had with children in your personal life?	1	2	3	4
How much experience have you had with children as a professional?	1	2	3	4

Directions: Please circle the response that you most identify with:
Items on this subscale were developed using the Child Life Council's "Child Life Internship Program Self-Review" (http://www.childlife.org/files/InternshipProgramSelfReview.pdf).

If the opportunity arises, how likely are you to attend a seminar or in-service training on how to…	**Very unlikely**	**Unlikely**	**Likely**	**Very likely**
effectively explain illness, procedures, surgeries, and medications to toddlers **(1-2)**?	1	2	3	4
effectively explain illness, procedures, surgeries, and medications to preschoolers **(3-5)**?	1	2	3	4
effectively explain illness, procedures, surgeries, and medications to school-age children **(6-11)**?	1	2	3	4
effectively explain illness, procedures, surgeries, and medications to adolescents **(12-18)**?	1	2	3	4
collaborate with families regarding developmental issues and impact of stressful events?	1	2	3	4
consider diversity and socio-economic issues of patients and their families?	1	2	3	4
interact and coordinate with interdisciplinary team members?	1	2	3	4

Part IV

Directions: Please circle the response that you most identify with:

	Strongly Disagree	**Disagree**	**Somewhat Disagree**	**Somewhat Agree**	**Agree**	**Strongly Agree**
The doctor is the one who should decide what gets talked about during a visit.	1	2	3	4	5	6
Although health care is less personal these days, this is a small price to pay for medical advances.	1	2	3	4	5	6
The most important part of the standard medical visit is the physical exam.	1	2	3	4	5	6
It is often best for patients if they do not have a full explanation of their medical condition.	1	2	3	4	5	6
Patients should rely on their doctors' knowledge and not try to find out about their conditions on their own.	1	2	3	4	5	6
When doctors ask a lot of questions about a patient's background, they are prying too much into personal matters.	1	2	3	4	5	6
If doctors are truly good at diagnosis and treatment, the way they relate to patients is not that important.	1	2	3	4	5	6
Many patients continue asking questions even though they are not learning anything new.	1	2	3	4	5	6
Patients should be treated as if they were partners with the doctor, equal in power and status.	1	2	3	4	5	6
Patients generally want reassurance rather than information about their health.	1	2	3	4	5	6
If a doctor's primary tools are being open and warm, the doctor will not have a lot of success.	1	2	3	4	5	6
When patients disagree with their doctor, this is a sign that the doctor does not have the patient's respect and trust.	1	2	3	4	5	6
A treatment plan cannot succeed if it is in conflict with a patient's lifestyle or values.	1	2	3	4	5	6
Most patients want to get in and out of the doctor's office as quickly as possible.	1	2	3	4	5	6
The patient must always be aware that the doctor is in charge.	1	2	3	4	5	6
It is not that important to know a patient's culture and background in order to treat the person's illness.	1	2	3	4	5	6
Humor is a major ingredient in the doctor's treatment of the patient.	1	2	3	4	5	6
When patients look up medical information on their own, this usually confuses more than it helps.	1	2	3	4	5	6

Questionnaire continues →

Descriptive and Background Information

1. I am: ☐ Female ☐ Male

2. What is your age? _____

3. Are you married? ☐ Yes ☐ No

4. Do you have any children? ☐ Yes ☐ No
   If so, how many? _____

5. I consider myself to be:
   - ☐ White/non-Hispanic
   - ☐ Black/non-Hispanic
   - ☐ Hispanic/Latino
   - ☐ Asian/Pacific Islander
   - ☐ Native American
   - ☐ Multi-racial
   - ☐ Other: _____

6. I am a(n):
   - ☐ undergraduate student
   - ☐ graduate/professional student

7. If you are a graduate student, what was your undergraduate area of concentration?
   Major: _____
   Minor (if applicable): _____

8. Do you plan to (or do you currently) work in the health care field?
   ☐ Yes ☐ No

9. College within the University of Florida:
   - ☐ Medicine
   - ☐ Nursing
   - ☐ Health & Human Performance
   - ☐ Public Health & Health Professions
   - ☐ Other: _____

10. Year in current program:
    - ☐ 1st
    - ☐ 2nd
    - ☐ 3rd
    - ☐ 4th
    - ☐ Other: _____

11. Future career plans:
    - ☐ Nurse
    - ☐ Nurse Practitioner
    - ☐ Physician
    - ☐ Physician Assistant
    - ☐ Physical Therapist
    - ☐ Hospital Administrator
    - ☐ Other: _____

12. If applicable, what is your main area of interest or specialty?
    - ☐ Pediatrics
    - ☐ Cardiology
    - ☐ Emergency Medicine
    - ☐ Hematology/Oncology
    - ☐ PICU
    - ☐ NICU
    - ☐ Family Medicine
    - ☐ Pathology or Immunology
    - ☐ Psychiatry
    - ☐ Urology
    - ☐ Radiology
    - ☐ Surgery
    - ☐ Aging/Geriatrics
    - ☐ Anesthesiology
    - ☐ Obstetrics and Gynecology
    - ☐ Neurology
    - ☐ Orthopaedics and Rehabilitation
    - ☐ Not Applicable
    - ☐ Other: _____

Thank you for taking the time to take this questionnaire!

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BIOGRAPHICAL SKETCH

Jessica Wente received her Bachelor of Science at Florida State University in Family and Child Sciences, minoring in Chemistry. After traveling as a consultant for a non-profit organization, Jessica attended Johns Hopkins Child Life Training Program, certifying as a child life specialist shortly after. She received her Master of Science from the University of Florida in Family, Youth, and Community Sciences. In her time at the University of Florida, Jessica continued clinical experience as a student and then as a professional at in the pediatric hematology oncology clinic of Shands at UF, a private, non-for-profit hospital. Upon graduation, Jessica accepted a child life specialist position with Florida Hospital for Children.