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Chronic Illness and Health Care Utilization Among Low-Income Preschoolers

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Chronic Illness and Health Care Utilization Among Low-Income Preschoolers

Morgan Prunty

**Thesis submitted
to the College of Education and Human Services
at West Virginia University**

in partial fulfillment of the requirements for the degree of

**Master of Arts in
Educational Psychology
With an emphasis in Child Development and Family Studies**

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ABSTRACT

Chronic Illness and Health Care Utilization Among Low-Income Preschoolers

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Chronic illness and poverty have both been associated with elevated rates of healthcare utilization and care postponement, individually; however, limited research has considered the interaction between these two variables on the utilization and postponement rates of preschool-aged children (Cohen et al., 2011; Cohen et al., 2012; Galbraith et al., 2012; Houtrow et al., 2008; Huang et al., 2005; Larson & Halfon, 2010; Loignon et al., 2015; Newacheck et al., 2002; Reid et al., 2008; Silver & Stein, 2001; Warfield & Gulley, 2006). Pearson's chi-square analyses were conducted to examine if patterns of healthcare utilization and care postponement differ based on the diagnosis of a chronic illness in a sample of preschool-aged children living below the poverty line prior to the instatement of the Affordable Care Act in the United States. Findings indicated that children with chronic illnesses had parents who perceived their children to be using more medical services than expected by chance and had higher than expected rates of utilization for emergency room visits. However, there were no relationships in rates of utilization for hospitalizations, operations, or major illnesses or for postponement of necessary medical care based on having a chronic illness. Findings from this study partially confirmed previous research stating that utilization of healthcare services are higher than expected by chance among children with a chronic illness. Uniquely, this is the first examination to find no relationship in the rates of care postponement and the diagnosis of a chronic illness among a sample of children living in the same context of poverty.

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Chapter I: Introduction

This investigation examined the patterns of utilization and postponement of healthcare for preschool-aged children living in poverty, prior to the instatement the Affordable Care Act in the United States, and if those patterns differed with a chronic illness diagnosis. While past literature has focused on children living in poverty and children with a chronic illness, less work has been done on children that fall into both categories. Those that have explored the links between chronic illness and socioeconomic status (SES) have done so comparing individuals across all economic backgrounds, which may not present an accurate depiction of what is happening for those families living in poverty (Arauz Boudreau et al., 2014; Huang, Kogan, Yu, & Strickland, 2005; Mayer, Skinner, & Slifkin, 2004; Ngui & Flores, 2006; Silver & Stein, 2001; Warfield & Gulley, 2006). Disproportionate resources that exist between families of higher versus lower SES brackets may be discounting the efforts being made by impoverished parents of children with a chronic illness when comparing them to other families living with similar economic resources. This current investigation expanded on these collections of literature by focusing solely on families living in poverty, as well as investigated healthcare patterns in a younger sample, which has also been under represented in the literature. Both poverty and a chronic illness diagnosis increase young children's healthcare requirements (Cohen et al., 2011; Cohen et al., 2012; Kuo et al., 2015; Larson & Halfon, 2010; O'Mahony et al., 2013; Schuster, Chung, & Vestal, 2011) as well as put them at a higher risk for having postponed or unmet needs (Arauz Boudreau et al., 2014; Houtrow, Kim, & Newacheck, 2008; Huang et al., 2005; Mayer et al., 2004; Newacheck, Hung, Hochstein, & Halfon, 2002; Reid, Vittinghoff, & Kushel, 2008; Silver & Stein, 2001; Warfield & Gulley, 2006). It was important to begin investigations that can help distinguish what factors may be driving the relationships connecting both chronic illness

and poverty to elevated levels of healthcare requirements and unmet needs, in order to better support this vulnerable group of children.

Overview

Chronic Illness

A chronic illness is a condition that lasts over a prolonged period, interrupts daily functioning, and requires specialized medical attention (Dowrick, Dixon-Woods, Holman, & Weinman, 2005; McPherson et al, 1998; Stein & Silver, 2002). These disorders are becoming much more prevalent among younger populations in the United States (Van Cleave, Gortmaker, & Perrin, 2010), meaning there is a growing need for more attention and funding to support and care for these children. When comparing chronically ill children to their healthy peers, they are spending much more time in a variety of healthcare settings and account for a higher percentage of medical expenditures (Cohen et al., 2011; Cohen et al., 2012; Kuo et al., 2015; O'Mahony et al., 2013; Schuster et al., 2011). Due to their drastically different medical needs, children with a chronic illness face unique barriers and challenges when trying to utilize healthcare. Specifically, children with a diagnosed chronic illness tend to have more unmet needs through postponement of care, experience more issues when trying to find and schedule appointments with adequate specialists, require treatment from numerous providers, many times in varying locations, and face much higher financial burden than their non-chronically ill peers (Cohen et al., 2011; Cohen et al., 2012; Houtrow et al., 2008; Huang et al., 2005; Silver & Stein, 2001; Warfield & Gulley, 2006). Due to their elevated essential healthcare needs, care must be coordinated, typically by parents, which can create extensive time and monetary requirements that parents of children without a chronic illness diagnosis do not have to worry about (Cohen et al., 2011; Schuster et al., 2011).

Poverty

The context in which a child with a chronic illness lives can exacerbate these barriers and challenges, making it more difficult to receive the medical care they need. Children who live in poverty, regardless of having a chronic illness diagnosis, confront their own obstacles surrounding the utilization of healthcare. Higher rates of hospitalizations and ER visits as well as lower quality care and increased postponed or unmet needs, stemming from a lack of resources, all impact children coming from lower SES backgrounds (Galbraith et al., 2012; Larson & Halfon, 2010; Loignon et al., 2015; Newacheck et al., 2002; Reid et al., 2008). Resources that are commonly strained when families living in poverty try to utilize healthcare services tend to be finances, time, transportation, consistency in their source of care, a lack of education or knowledge, and insurance coverage (Aizer, 2017; Ames, 2007; Larson & Halfon, 2010; Loignon et al., 2015; Reid et al., 2008). When looking at these factors together, children with a chronic illness, who also live in poverty have even higher rates of unmet needs, increased financial burden due to elevated costs and limited financial resources, and increased difficulties finding and using necessary healthcare services (Arauz Boudreau et al., 2014; Huang et al., 2005; Mayer et al., 2004; Ngui & Flores, 2006). Understanding what elements of a child's life may be contributing to their utilization or postponement of healthcare services may provide a better outlet to ensure that their needs are being met.

Young Children

Additionally, when children are diagnosed with an early onset chronic illness it dramatically increases their risk of developmental impairments that can affect them for the rest of their lives (Russ, Garro, & Halfon, 2010; Schuster et al., 2011). These children are also solely reliant on their parents' resources and behaviors in ensuring that their healthcare needs are being

met (Schuster et al., 2011). Young children with a chronic illness diagnosis are much more reliant on family-centered care, in which families work collaboratively with their children's healthcare team to ensure all their needs and concerns are being met (Kuo, Bird, & Tilford, 2011). When delivered properly family-centered care can buffer some of the negative effects associated with both living in poverty and having a chronic illness (Arauz Boudreau et al., 2014; Kuo et al., 2011; Ngui & Flores, 2006). Parents of a child that is diagnosed with a chronic illness early in life are required to act as coordinators and managers of care, safety monitors, and transportation to appointments, all while still accountable for their regular, real-world responsibilities (Cohen et al., 2011; Schuster et al., 2011). Understanding how the barriers faced by parents living in poverty can affect the healthcare utilization of their young children with a chronic illness is extremely important because of the child's dependency on their parent or guardian's behaviors in their accessing and use of necessary medical services.

Theoretical Framework

All the aforementioned barriers to healthcare utilization faced by impoverished families with a child with a chronic illness can be examined through the Bioecological Model of Human Development. As described by Bronfenbrenner and Morris (2006), the Bioecological Model of Human Development looks at individual characteristics, the various levels of the context that surrounds an individual, the role of time, and the proximal processes, or everyday interactions with others, to understand how they shape development. Specifically, the Process, Person, Context, Time (PPCT) Model will be used to understand how different person, context, and time factors present within an individual's life can impact the construction of diverse situations that can affect the interactions or processes they experience, therefore creating variability in development (Bronfenbrenner & Morris, 2006). Proximal processes are the driving force behind

human development and can be influenced by person characteristics such as age or the severity of a chronic illness diagnosis, context such as the available resources, specifically financial means or doctors, and the timing of when things occur such as the instatement of federal policies, such as the Affordable Care Act, which changes the availability of certain resources (Bronfenbrenner & Morris, 2006).

Current Study

The current study examined the rates of healthcare utilization and postponement of necessary medical care among preschool-aged children (3 – 5 years of age) living in poverty. Three elements of healthcare utilization (experiences of hospitalizations, operations, or major illnesses, frequency of ER visits, and parent's perceptions of their child's use of healthcare services) and one factor of care postponement (was there a time when the child needed medical services but did not receive them) reported by parents on their child's healthcare use over the preceding 12 months were analyzed among children with and without a diagnosed chronic illness living in poverty. The following research questions were addressed:

1. Does the utilization of healthcare and parental perceptions of the rate of utilization, among preschool-aged children living in poverty differ based on the diagnosis of a chronic illness?

Hypothesis: Children with a diagnosed chronic illness will have higher than expected rates of healthcare utilization and parental perceptions of medical service use, while children with no chronic illness diagnosis will have lower rates than expected based on chance.

2. Does postponement of care, when care is identified as needed by the parent, differ for preschool-aged children living in poverty based on the diagnosis of a chronic illness?

Hypothesis: Children without a diagnosed chronic illness will have higher than expected rates of parental postponement of care, when care was needed, while children with a chronic illness diagnosis will have lower rates than expected based on chance.

Chapter II: Literature Review

Chronic illness diagnoses are much more relevant to the lives and development of children with the prevalence of these conditions having increased substantially in recent years. Evidence of this increase was presented by Van Cleave et al. (2010) in their three-cohort analysis from 1994 – 2006. The prevalence of having a diagnosed chronic illness was increasingly higher for later cohorts; with 26.6% of cohort three having a chronic illness, while only 12.8% of cohort one were diagnosed with a chronic illness (Van Cleave et al., 2010). No further examination of what factors, such as changing identifiers or technology, that may have played a role in this increase was done.

Chronic illness has been defined a few different ways over the years (Dowrick et al., 2005; McPherson et al, 1998; Stein & Silver, 2002). Stein and Silver (2002) compared the operationalization of four of these definitions and found that there was significant overlap among them; however, research utilizing one definition over another could face methodological problems. With this consideration in mind, a very broad classification has been identified and defined as a child with a long-term illness that requires special medical needs or services (Dowrick et al., 2005; McPherson et al, 1998; Stein & Silver, 2002).

Children living with a chronic illness are faced with unique healthcare needs. They have been identified as needing more overall and specialized care than their non-chronically ill peers need. They tend to receive more inpatient and outpatient care, have higher rates of emergency room (ER) visits, longer hospital stays, more unmet needs, and increased school absences (Cohen et al., 2012; Dosa, Boeing, & Kanter, 2001; Houtrow et al., 2008; Huang et al., 2005; Kuo et al., 2015; O'Mahony et al., 2013; Mayer et al., 2004; Schuster et al., 2011; Silver & Stein, 2001). Children with a chronic illness may also require treatment by various medical

professionals, therefore, demanding coordination of care by parents and doctors (Cohen et al., 2011; Kuo et al., 2011; Schuster et al., 2011). When considering medical expenditures, children diagnosed with a chronic illness make up a much larger portion of healthcare costs in all areas of care than their healthy counterparts (Cohen et al., 2012; Houtrow et al., 2008; Kuo et al., 2015).

While the previously discussed difficulties associated with healthcare use exist for children with a chronic illness, they can also be compounded with difficulties associated with SES. It has been well established that children living in poverty have poorer overall health, an increased risk of developing a chronic illness, and tend to face unique obstacles when trying to utilize healthcare services (Hillemeier, Lanza, Landale, & Oropesa, 2013; Larson & Halfon, 2010; Loignon et al., 2015; Reid et al., 2008). These children are more likely to have higher rates of unmet needs through caregivers' postponement of necessary medical care and medications, higher hospitalization rates, more ER visits, and less non-emergency healthcare visits than their more affluent peers (Huang et al., 2005; Larson & Halfon, 2010; Mayer et al., 2004; Newacheck et al., 2002; Reid et al., 2008). Lower SES children and their families also tend to experience poorer quality interactions with healthcare professionals, have poorer access to care due to a lack of resources (i.e., insurance coverage, funds for out-of-pocket fees, transportation, education, knowledge, time, etc.), have no consistency in their source of care, and their primary caregiver(s) have more difficulties navigating the complex healthcare system (Aizer, 2017; Ames, 2007; Larson & Halfon, 2010; Loignon et al., 2015; Newacheck et al., 2002; Reid et al., 2008; Russ, Garro, & Halfon, 2010; Wilson-Simmons, 2016).

These associations exist because of the contexts in which these families reside which includes poor or unsafe living conditions, having to use their limited resources for basic needs, such as food and housing, insufficient wages and employee benefits, as well as the social

differences that exist between doctors and patients from lower SES backgrounds, which create issues with communication (Aizer, 2017; Ames, 2007; Loignon et al., 2015; Newacheck et al., 2002; Reid et al., 2008; Russ et al., 2010). Fewer studies have analyzed the interaction between poverty and chronic illness, when comparing chronically ill to non-chronically ill children all from low SES backgrounds, in creating barriers to healthcare utilization. However, previous literature that has considered this relationship has found that chronically ill children living in poverty, when compared to their more affluent chronically ill age-mates, experienced more unmet needs through care postponement due to elevated financial burden on their families, a lack of necessary resources, and increased difficulties in locating and using healthcare services (Arauz Boudreau et al., 2014; Huang et al., 2005; Mayer et al., 2004; Ngui & Flores, 2006). Due to the excessive barriers to healthcare faced by children with a chronic illness and those living in poverty, understanding how the combination of these risk factors can create more opportunities for unmet needs through care postponement, which can lead to later developmental and health complications, can provide insight into the processes that need attention and improvement at the policy level (Schuster et al., 2011).

Within this review of pertinent literature, the four components of the PPCT Model will be discussed individually. Various features of individual person characteristics, differing levels of context, and the changes that occur over time all create unique qualities within the processes occurring in children's interactions surrounding their utilization of medical services. Gaining a better understanding of what within each of these areas may be creating barriers to healthcare for chronically ill children that live in poverty may provide insight to building better support systems to ensure their medical needs are being met.

The Bioecological Model of Human Development

One method of examining and better understanding children's healthcare utilization and postponement patterns, specifically when considering factors such as chronic illness and poverty, is by using the Process, Person, Context, Time (PPCT) model within The Bioecological Model of Human Development (Bronfenbrenner & Morris, 2006). Bronfenbrenner and Morris (2006) stated that through the Bioecological Model, to understand the development of humans, one must understand the connections between individual person characteristics, the ecological systems or context that surrounds them, and the role of time on daily interactions with others, also known as proximal processes, which act as the driving force behind development.

Proximal processes are consistent, reoccurring interactions within a person's life that help to shape their development (Bronfenbrenner & Morris, 2006). These processes can be impacted by the other components within the PPCT model; person characteristics, context, and time (Bronfenbrenner & Morris, 2006). The person characteristics of all individuals, such as their age, gender, or ethnicity, play a role in what they uniquely bring to the interactions they have with others, which are housed within the varying levels of context that make up their environment (Bronfenbrenner & Morris, 2006).

The distinct levels of context, specifically the microsystem, mesosystem, exosystem, and macrosystem, originally the centerpiece of Bronfenbrenner's (1979) Ecological System's Theory, now serve as the setting in which daily interactions or proximal processes occur (Bronfenbrenner & Morris, 2006). When considering the various levels of context, it is important to remember the original systems of Bronfenbrenner's (1979) work. It was explained that the microsystem was the most proximal subsystem to the developing individual in which their everyday interactions and activities are housed. A relevant example of a child's microsystem

would be their direct interactions with parents, doctors, or nurses. Beyond the microsystem is the mesosystem, which incorporates the interactions of components of the microsystem, such as communication between the child's parents and healthcare team (Bronfenbrenner, 1979; Bronfenbrenner, 1992; Bronfenbrenner & Morris, 2006). Next is the exosystem, which is made up of elements of the environment that indirectly impact development, such as the local healthcare resources and policies (Bronfenbrenner, 1979; Bronfenbrenner, 1992; Bronfenbrenner & Morris, 2006). Beyond the exosystem is the most distal level of an individuals' environment, the macrosystem, containing the broader cultural or social context (Bronfenbrenner, 1979; Bronfenbrenner, 1992). The current healthcare culture and federal laws would be an applicable example of the macrosystem. The final level of an individuals' ecological system is the chronosystem.

The final system of Bronfenbrenner's (1992) earlier work, the chronosystem, was used to explain the influence of time on development, taking into consideration the timing of occurrences within one's life and the historical time in which they live. This could be the existing medical technology as well as the federal policies surrounding healthcare that are established during a child's life. This component has been teased out into the final concept of the PPCT Model and considers how changes in or throughout time can affect all other elements of the model, therefore creating new circumstances surrounding the occurrences of proximal processes (Bronfenbrenner & Morris, 2006).

Utilizing Bronfenbrenner and Morris's (2006) Bioecological Model of Human Development can help to illustrate what person characteristics, contextual factors, and timing may be contributing to healthcare utilization and postponement patterns for children with a diagnosed chronic illness that also live in poverty.

Process

The proximal process of interest is whether or not children, specifically those living in poverty, with or without a chronic illness diagnosis, are interacting with the healthcare system when medical care is needed. As previously mentioned, several factors including person characteristics, context, and time can alter this process (Bronfenbrenner & Morris, 2006). Understanding what is increasing the utilization of healthcare services as well as what could be keeping children from receiving necessary medical care can provide better knowledge to create support for this population. Factors within each component of the PPCT Model will be discussed in how they may be affecting the specific process of accessing healthcare.

Person Characteristics

Person characteristics such as a child's ethnicity, gender, and age can influence their risk of being diagnosed with a chronic illness as well as their rate of healthcare utilization and postponement. Chronic illness diagnoses tended to be more common in African American children (Houtrow et al., 2008) and White children (Kuo et al., 2015) as well as in boys (Cohen et al., 2012; Houtrow et al., 2008; Kuo et al., 2015). However, children from minority families, specifically those who are Hispanic, African American, and multiracial, tended to have more difficulties utilizing or accessing care (Ngui & Flores, 2006) and have higher rates of delayed or foregone care (Huang et al., 2005; Mayer et al., 2004).

Prevalence, utilization, and postponement rates have also tended to differ by age. School-aged children and adolescents have been known to have higher chronic illness diagnosis rates (Dosa et al., 2001; Kuo et al., 2015) as well as more unmet needs through postponed or foregone care (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006). However, overall utilization rates were significantly higher for infants and young children (Dosa et al., 2001; Kuo

et al., 2015; Warfield & Gulley, 2006). Knowing how the characteristics of a child can influence their risk of having a chronic illness as well as their utilization rates and postponement of care is important in understanding how they might be altering the proximal processes they are engaged in during their daily interactions (Bronfenbrenner & Morris, 2006).

Context

Bronfenbrenner and Morris (2006) discussed context as being the various levels of the environment that can directly or indirectly influence an individual's development. There are four levels of context, or ecological systems, that will be discussed, including: the microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner & Morris, 2006). Within each of these systems, various factors can play a role in the process of children, specifically those with a diagnosed chronic illness and living in poverty, utilizing and postponing necessary healthcare services.

Microsystem. Within the microsystem, an important factor to consider when analyzing utilization and postponement issues is the influence of poverty. While poverty creates its own barriers to healthcare, its impact can differ when compounding it with a chronic illness diagnosis. Families with a chronically ill child face elevated levels of financial burden associated with their child's increased healthcare needs, with their overall expenses ranging from 2.4 – 14.2 times higher (Kuo et al., 2015) and their out-of-pocket fees ranging from 1.5 – 6.8 times higher than their non-chronically ill peers (Houtrow et al., 2008), with expenses varying based on the severity and complexity of the diagnosis (Cohen et al., 2012). Children with a chronic illness, who also live in poverty, are much more impacted by these increased levels of financial burden (Houtrow et al., 2008). Higher rates of unmet routine and specialty care needs through postponement of care have been found to be associated with concerns surrounding cost,

specifically for families living near or below the poverty line (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006). Due to this higher risk of postponed care because of financial barriers, these children are more likely to experience preventable hospitalizations, such as ER visits and ICU admissions, due to earlier postponement of needed care (Dosa et al., 2001).

Impoverished children with a chronic illness also face issues surrounding insurance coverage. It has been found that a lack of insurance coverage contributed greatly to the increased rates of delayed and foregone care among children with a diagnosed chronic illness living in poverty, regardless of the length of time the child was uninsured (Huang et al., 2005; Mayer et al., 2004; Silver & Stein, 2001). Unmet needs tended to increase when family income levels decreased (Silver & Stein, 2001). However, Silver and Stein (2001) found that children with a chronic illness diagnosis living in poverty were more likely to have some kind of insurance coverage, typically publicly funded, when compared to their non-chronically ill counterparts.

Mesosystem. Moving beyond the microsystem, poverty also plays an important role within the mesosystem, creating issues among the interactions between chronically ill children's caregivers and medical providers. Previous literature has found that parents and caregivers whose families live in poverty tend to face complications when navigating the multifaceted healthcare system, experience lower quality interactions with medical personnel, and lack a consistent source of care for their child (Ames, 2007; Larson & Halfon, 2010; Loignon et al., 2015; Newacheck et al., 2002). Some researchers found that when compared to their healthy peers, families of chronically ill children reported lower levels of satisfaction with their medical care (Kuo et al., 2015). However, this analysis did not consider the influence of poverty. There is a lack of research that looks at the quality of interactions and healthcare system navigation issues among parents of a child with a diagnosis chronic illness that also live in poverty. However, in

regard to consistency of care, families with a child with a chronic illness, regardless of their SES background, have reported that their child had a regular care provider (Houtrow et al., 2008; Silver & Stein, 2001). Mayer and colleagues (2004) found that this consistency regarding where children received their medical care was linked with lowered risk for unmet needs. All these findings together have begun to clearly identify the interaction between poverty and chronic illness in the inconsistency surrounding children's source of care.

Along with poverty, numerous factors associated with caregivers' abilities to work with their chronically ill child's healthcare team to coordinate their care can lead to further concerns within the mesosystem. Schuster and colleagues (2011) explained the responsibilities parents and caregivers of children with a chronic illness take on when interacting with others in the healthcare system. Parents must take on this role of care coordinator to ensure that their child's care is consistent and informed by accurate information being transferred from the healthcare team to the family (Schuster et al., 2011). As we will see later, things such as parent workplace responsibilities can hinder their ability to work with their child's medical team, making care coordination more difficult, especially for families living in poverty (Lombardi & Coley, 2013; Schuster et al., 2011). Parents are also responsible for scheduling and transporting their child to healthcare clinics, providing necessary proof of insurance and medical history, and filling out paperwork, all while supervising their child (Schuster et al., 2011). During interactions with medical providers, parents assist in creating care plans that they must then implement: parents must ensure adherence to the care plan, fill prescriptions, lab requests, and monitor and maintain any medical technology (Schuster et al., 2011).

Current models of care view a child's primary care physician as the center of their care coordination, but this does not always effectively meet the high demand of needs faced by

children with a chronic illness (Cohen et al., 2011). These children require more family-centered care to assure caregivers and all the child's medical providers are informed and involved in medical decisions (Cohen et al., 2011; Ngui & Flores, 2006). Parents have reported issues such as time constraints, language or cultural barriers, insufficient communication, and inadequate or contradictory information when doctors do not properly coordinate or use family-centered care (Huang et al., 2005; Ngui & Flores, 2006). Parental factor including language and education level can also hinder effective care coordination and increase the risk of unmet needs (Ngui & Flores, 2006; Mayer et al., 2004; Warfield & Gulley, 2006).

However, medical care that is family-focused and coordinated efficiently can greatly improve outcomes for both children with a chronic illness and their families. Kuo and colleagues (2011) found that decreases in unmet needs, ER visits, care postponement, and financial burden as well as increases in access to and appropriate use of medical services, stability of health status, and assistance with care coordination were associated with effective family-centered care. This association may be due to better communication between parents and their child's medical team, meaning all concerns and questions are being addressed and everyone involved in the delivery of care are properly informed (Kuo et al., 2011). While Arauz Boudreau et al. (2014) described that medical services with a family-centered approach was linked with decreased rates of unmet needs for chronically ill children, regardless of poverty status. These findings demonstrate the importance of incorporating the entire family in the management and care of a chronic illness as well as how factors such as poverty and provider and parental characteristics can influence the quality of care.

Exosystem. Geographic location, local medical care resources, and parent's workplace are factors within the exosystem that can indirectly influence the healthcare utilization or

postponement of care patterns of a child with a chronic illness. Rates of unmet needs through foregone or postponed care tend to differ based on the geographic location in which children with a chronic illness and their families live (Huang et al., 2005; Mayer et al., 2004). Typically, rates of postponing care are twice as high for families living in the Southern or Western parts of the United States (Huang et al., 2005). Living in more urban areas is associated with a higher quantity of local medical providers, which lowers the risk of unmet needs (Mayer et al., 2004). These are both important considerations for the sample of the current study which was recruited from the Southern part of the country, specifically from urban Miami, Florida. In addition to the resources available by region or community type, the specific physicians available, their skills, and the services they provide, can also vary by location and influence utilization and postponement of care (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006).

Previous literature has found that unmet medical needs among children with a diagnosed chronic illness are associated with lower rates of accessible pediatric specialists (Mayer et al., 2004). Families of a child with a chronic illness have consistently identified several reasons for postponing or foregoing their child's medical needs including trouble finding skilled and experienced pediatric specialists in their area as well as accessibility and insurance issues (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006). Families that experienced accessibility issues had trouble contacting their child's doctor by phone, scheduling appointments, finding the time to go when the office was open, or had to wait too long to get in to see a doctor when care was needed (Huang et al., 2005). Issues with unmet needs also occurred when the medical provider would not accept a family's health insurance plan, or a child did not have the necessary referrals (Huang et al., 2005; Warfield & Gulley, 2006).

Local regulations surrounding workplace benefits for parents and primary caregivers can also indirectly affect the utilization and postponement patterns of chronically ill children. Schuster and colleagues (2011) discussed the needs and issues employees have surrounding employer provided insurance and time off, specifically those with a child living with a chronic illness. Even with federal guidelines governing these policies, local companies have the ability to set specific policies or eligibility requirements regarding their benefits, specifically time off and health insurance coverage (Schuster et al., 2011). Some companies do not provide their employees with health insurance, which can limit a family's capability of utilizing healthcare services for their child (Schuster et al., 2011). While employer covered insurance is governed by federal policies, enforcement and eligibility qualifications can vary by location or company (Schuster et al., 2011). Employers may also restrict their employee's opportunities to take time off work for medical reasons, demanding they meet certain requirements, therefore increasing the risk of an employee's child having unmet needs through delayed or foregone care (Schuster et al., 2011). Employees with a child with a chronic illness require much more flexibility within the workplace because of their child's elevated medical needs (Schuster et al., 2011).

Furthermore, a common reason parents report postponed or foregone medical care for their child with a diagnosed chronic illness is time conflicts with workplace responsibilities (Huang et al., 2005; Schuster et al., 2011). This can create further barriers for families living in poverty because of their need to manage competing priorities that strain their limited financial resources. Parents may be juggling multiple jobs or be unable to afford taking time off from work to get their child to the doctor (Lombardi & Coley, 2013; Schuster et al., 2011). Finding and keeping a job, regardless of being provided health insurance or sick leave, is critical for families living in poverty; even more so if they have a child with a chronic illness (Lombardi &

Coley, 2013; Wilson-Simmons, 2016). However, for parents with a child with a chronic illness, having a job that provides these benefits is more critical. Parents living in poverty may also experience the need to work multiple part-time jobs, which typically do not offer employee benefits, to maintain a livable income (Lombardi & Coley, 2013). This can create even more issues with time conflicts because parents are forced to work around multiple employers' needs with less benefits and support.

Even after securing a job, parents of a child with a chronic illness, regardless of income, may be asked to reduce their hours at work or quit so that they are not causing excessive disruptions to company operations through their time off (Schuster et al., 2011). Schuster and colleagues (2011) discussed that parents of children with a chronic illness are far more likely to face job loss or change as well as a loss of income due to their child's care requirements. Experiencing issues with employment stability can hinder parents' abilities to care for their chronically ill child due to increased financial strain, potentially creating more severe problems for families from impoverished backgrounds. Taken together, all the aforementioned barriers to healthcare services reflect the resources available to children with a chronic illness within their local community and/or through their parent's work. When issues in accessibility occur, there are increased risks of care postponement within this population (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006).

Macrosystem. Within the macrosystem, factors such as federal health insurance and employee leave policies can influence healthcare utilization and postponement rates for children living in poverty with a chronic illness diagnosis. Federal laws surrounding health insurance eligibility requirements and mandates indirectly affect children with a diagnosed chronic illness through their accessibility and cost (Morrissey, 2012). Public insurance programs like Medicaid

and the Children's Health Insurance Program (CHIP) provide coverage for lower income families, but issues surrounding enrollment and reenrollment still exist (Morrissey, 2012).

Morrissey (2012) explained that large quantities of paperwork and issues with ignorance of or fluctuating eligibility status contribute to these issues. Another federal policy known as the Affordable Care Act (ACA) created additional mandates and supports to assist individuals and families in attaining both public and private health insurance, therefore benefiting both low- and middle-class Americans (Patient Protection and Affordable Care Act, 2010; Morrissey, 2012).

Federal laws surrounding employee leave policies at their parent's workplace can also play a role in the utilization and postponement patterns of children with a chronic illness. The Family and Medical Leave Act (FMLA) requires that employers provide at least 12 weeks of medical leave to employees to attend to the medical concerns for themselves and immediate family members, without threat of termination or loss of benefits; however, this policy does not apply to all companies (Schuster et al., 2011). Schuster and colleagues (2011) explained how the lack of universal protection through this policy leaves approximately 47% of workers in the United States at risk of termination or loss of insurance coverage for taking sick days to care for themselves or an immediate family member who is ill. Even with job and benefit protection, millions of individuals identified that they could not afford to take extended time off from work (Schuster et al., 2011). These federal policies lay the groundwork for what regulations state governments and local companies provide for their employees, which for chronically ill children can affect their family's ability to get them necessary medical care. This can create an elevated risk for unmet needs through the postponement or delay of care (Schuster et al., 2011).

Time

Time, which fell within the chronosystem in Bronfenbrenner's (1992) earlier work, has now been separated into the fourth component of the PPCT Model (Bronfenbrenner & Morris, 2006). When considering historical time, it can affect chronically ill children through what policies are currently governing matters related to healthcare as well as the medical technology that is available. Public health insurance policies have changed drastically over time and continues to impact healthcare utilization and postponement rates. Prior to the establishment of the ACA in 2010, millions of children were not covered by health insurance, putting them at greater risk for postponed or delayed care (Morrissey, 2012). Other publicly funded health insurance programs, such as Medicaid and CHIP, existed prior to the ACA but still left millions of eligible children without insurance coverage (Morrissey, 2012). Since the instatement of the ACA, health insurance has become more readily accessible through less stringent eligibility requirements for public insurance, increases in subsidies to help cover the cost of private insurance, and protections to prohibit private insurance companies from denying or revoking coverage due to the diagnosis of certain conditions (Patient Protection and Affordable Care Act, 2010; Morrissey, 2012). Understanding the implications of restrictive public insurance for low income families that previously existed in the United States is especially relevant within the current study in which the data being used was collected before the establishment of the ACA.

The development of new and advanced medical technology also exemplifies the chronosystem at work. Children with a diagnosed chronic illness may require technology assisted care for a variety of medical needs (Cohen et al., 2011; Cohen et al., 2012). This technology typically allows for more freedom, in that children with severe chronic illness diagnoses are not restricted to life in a medical facility (Schuster et al., 2011). However, this can

increase the burden felt by parents due to the increased time commitment utilizing, monitoring, and maintaining their child's equipment (Schuster et al., 2011). This burden can be greater for families living in poverty due to a lack of time and financial resources to dedicate to their child's assistive medical technology. More advanced technology has increased the life expectancy of children with several chronic illnesses as well as decreased the number of infant deaths from what had been seen in previous decades (Cohen et al., 2012).

Current Study

A goal within the current study was to fill existing gaps in this area of literature in order to gain a better understanding of the healthcare utilization and postponement patterns of children living in poverty with a diagnosed chronic illness. Previous literature has failed to focus solely on preschool-aged children, which is important because of their reliance on parental or caregivers' behaviors towards healthcare as well as the implications for health in later life (Russ et al., 2010; Schuster et al., 2011). Young children are not able to provide or care for themselves, therefore it is their caregiver's responsibility to ensure that their needs, including healthcare needs, are being met (Russ et al., 2010; Schuster et al., 2011). There has also been a lack of research done with the entirety of the sample living below the federal poverty line. For example, several studies have analyzed healthcare utilization and unmet needs of chronically ill children in relation to both other chronically ill children as well as healthy children across income levels (Arauz Boudreau et al., 2014; Houtrow et al., 2008; Huang et al., 2005; Kuo et al., 2011; Mayer et al., 2004; Ngui & Flores, 2006; Warfield & Gulley, 2006). However, none has considered the differences in these patterns for children with a chronic illness living in poverty in relation to children without a chronic illness that also live in poverty. It could be, as seen in the findings surrounding consistency in the source of where children with a chronic illness receive their

medical care, that parents with a chronically ill child, despite being faced with the challenges of living in poverty, work to ensure they are meeting their child's needs, more so than other families living in poverty (Houtrow et al., 2008; Silver & Stein, 2001). Thus, it is important to understand what differences exist among children with similar SES backgrounds but different medical care needs.

The current study examined the rates of healthcare utilization and postponement of needed medical services among preschool-aged children (3 – 5 years of age) living in poverty both with and without the diagnosis of a chronic illness. Three components of healthcare utilization over the past 12 months were analyzed, including: experiences of hospitalizations, operations, or major illnesses, frequency of ER visits, and parent's perceptions of their child's use of healthcare services. One component of care postponement in the last 12 months was analyzed, specifically, if there was a time when the child needed medical services but did not receive them. Parental reports of reasons for postponement of care were also examined in terms of frequency. The following research questions were addressed:

1. Does the utilization of healthcare and parental perceptions of the rate of utilization, among preschool-aged children living in poverty differ based on the diagnosis of a chronic illness?

Hypothesis: Children with a diagnosed chronic illness will have higher than expected rates of healthcare utilization and parental perceptions of medical service use, while children with no chronic illness diagnosis will have lower rates than expected based on chance.

2. Does postponement of care, when care is identified as needed by the parent, differ for preschool-aged children living in poverty based on the diagnosis of a chronic illness?

Hypothesis: Children without a diagnosed chronic illness will have higher than expected rates of parental postponement of care, when care was needed, while children with a chronic illness diagnosis will have lower rates than expected based on chance.

Chapter III: Method

Participants

Participants in the current study were part of the Miami-Dade School Readiness Project (MDSRP; Winsler, Tran, Hartman, Madigan, Manfra & Bleiker, 2008). The MDSRP followed five cohorts of low-income children in subsidized non-Head Start childcare from 1999 to 2005 following each cohort for two consecutive years when they were 3 – 5 years of age and examined their cognitive, language, and physical development (Winsler et al., 2008). A subset of data from this larger project was used to examine how healthcare utilization and postponement patterns differ for preschool-aged children living in poverty, based on the diagnosis of a chronic illness. A subsample ($n = 681$) of the original 3,838 mother-child pairs from the 1999 cohort were randomly chosen to answer an additional health questionnaire. Of these 681 mother-child pairs, children were 51% male, 49% female, 40% Hispanic/Latino, 39% Black, 5% White, or 16% Other, and were on average 3.15 years hold ($SD = .83$). Of these 681 participants, 87 of the children were identified as having a chronic illness through a series of questionnaire responses, with the remaining 594 children not having a chronic illness diagnosis (Winsler et al., 2008).

Procedures

The Miami-Dade County Child Development Services (CDS) contacted mothers of families upon their enrollment in a subsidized childcare program in 1999 about participating in the MDSRP project. The CDS personnel explained the study to these mothers, expressing that their participation, or lack thereof, would not affect their child's enrollment in their subsidized childcare. If mothers agreed to participate, the CDS personnel collected signed consent forms. From this larger sample of participants, a randomly selected subsample completed an additional

health questionnaire developed and administered by the Florida Supporting Partnerships to Assure Ready Kids (SPARK) of Miami-Dade County.

Measures

Child gender. Information about child gender was collected through parent report on the health questionnaire. Parents responded to the question, “Is your child a...” with either “boy” or “girl” (binary; girl = 0, boy = 1).

Child age. Child age was collected through parent report on the health questionnaire. Parents reported their child’s birth date. Children’s birth date and the date their questionnaire was completed was used to determine the child’s age in months at time of data collection.

Child race and ethnicity. Child ethnicity was collected through parent report on the health questionnaire. Parents responded to the question “What race do you consider your child to be?” by selecting one of the following categories: White, Asian, Black or African American, American Indian or Alaska Native, Hawaiian or other Pacific Islander, or Other. Parents also responded to the question “Is your child Hispanic?” with “yes” or “no” (binary: 0 = no, 1 = yes). Information from both questions was used in combination to create the following categories: Caucasian (White non-Hispanic, $n = 36$), Latino (White Hispanic, $n = 261$), African American (Black non-Hispanic, $n = 236$), Afro-Hispanic (Black Hispanic, $n = 21$), or Other ($n = 102$). African American and Afro-Hispanic were combined to align with the United States Census information ($n = 257$; U.S. Census Bureau, 2008).

Child health insurance. Child insurance coverage was assessed through parent report on the health questionnaire. Parents responded with “yes” or “no” when asked, “Do you have health insurance for your child?” (binary: 0 = no, 1 = yes).

Chronic illness. The diagnosis of a chronic illness was assessed using parent reported responses on the health questionnaire. If parents responded “yes” to three (binary; 0 = no, 1 = yes) questions their child was classified as having a diagnosed chronic illness. The questions were as follows: “Does your child need or use medication prescribed by a doctor (other than vitamins)?,” “Is this because of ANY medical, behavioral or other health conditions?,” “Is this a condition that has lasted or is expected to last at least 12 months?” The parents of children identified as not having a diagnosed chronic illness responded with a “no” on at least one or more of these items, while children whose parents responded “yes” to all three questions were identified as having a chronic illness. These questions were identified as in-line with the broadest definition of chronic illness present in previous literature utilized within this investigation, specifically, that chronic illness lasts over an extended period of time and requires special medical treatment (Dowrick et al., 2005; McPherson et al, 1998; Stein & Silver, 2002).

Healthcare utilization. Three types of healthcare utilizations were examined. The first involved major illnesses, operations, and hospitalizations. It was assessed by a parent report on the health questionnaire. Parents responded with “yes” or “no”, (binary; 0 = no, 1 = yes) when asked, “Any hospitalization, operation, or major illness (specific problem)?” The second type of healthcare utilization involved emergency care via the number of ER visits for their child in the last 12 months. It was assessed by a parent report on the health questionnaire. Parents were asked, “During the last 12 months, how many times has your child gone to the hospital emergency room about his health?” Responses could be one of five response categories: 0, 1, 2 – 3, 4 – 5, and 6 or more. The variable was recoded into four categories to establish more equal cell sizes: 0, 1, 2 – 3, and 4 or more. The third investigated parental perceptions of their child’s use of healthcare services. It was assessed by a parent report on the health questionnaire. Parents

responded with “yes” or “no” when asked, “Does your child use more medical care, mental health or educational services than is usual for most children of the same age” (binary; no = 0, yes = 1).

Postponement of care. Postponement of care was assessed by a parent report on the health questionnaire. Parents responded with “yes” or “no” (binary; 0 = no, 1 = yes) when asked, “In the past 12 months, has there been a time when you thought your child should get medical care, but did not?” If parents reported “yes,” they could indicate why; however, most chose not to disclose this information. Parents could select one or more reasons for postponement of care from a provided list, which included: “You couldn’t get through on the telephone,” “You couldn’t get an appointment for your child soon enough,” “Once there your child had to wait too long to see the doctor,” “The clinic or doctor’s office wasn’t open when you got there,” “You didn’t have transportation,” and/or “You couldn’t afford to pay for care.”

Data Analyses

Descriptive statistics. Child gender, ethnicity, and health insurance status were each examined individually with the independent variable, diagnosis (or lack) of a chronic illness, using three chi-square analyses, while child age was examined with the independent variable, diagnosis (or lack) of a chronic illness, using a t-test. Due to these factors being found in previous literature to be associated with healthcare needs, utilization, and postponement, if any are significantly different by diagnosis group, and cell sizes permitting, the below chi-square analyses were to be conducted as dummy coded logistic regression.

Healthcare utilization. The study hypothesis that utilization patterns of healthcare by preschool-aged children living in poverty is associated with having a chronic illness diagnosis was examined using three chi-square analyses. Specifically, it was hypothesized that children

with a diagnosed chronic illness were more likely to have rates of healthcare utilization higher than expected by chance, and their parents would perceive the rate as higher than expected, differing from children with no chronic illness diagnosis. The independent variable in all chi-square analyses, diagnosis (or lack) of a chronic illness, was analyzed with each of the dependent variables making up healthcare utilization: (a) if the child experienced of any hospitalizations, illnesses, or operations in the last 12 months, (b) the number of times the child went to the ER in the last 12 months, and (c) parental perceptions of their child's use of healthcare.

Postponement of care. The study hypothesis that postponement of care by the parent(s) of preschool-aged children living in poverty would be higher than expected by chance among children without a diagnosed chronic illness was examined using a chi-square analysis. Specifically, it was hypothesized that children without a diagnosed chronic illness would have higher rates than expected by chance for parental postponement of care, when care was needed, differing from children with a chronic illness diagnosis. The independent variable of diagnosis (or lack) of a chronic illness was analyzed with the dependent variable of instances of care postponement. Reported reasons for care postponement was completed sparsely by parents, therefore, this information was examined only in terms of frequency and placement within context of the Bioecological Model of Human Development.

Chapter IV: Results

Descriptive Statistics

Descriptive statistics for child demographics, specifically gender, ethnicity, and age, as well as health insurance status of the entire sample were analyzed. This sample consisted of 51% males, 3.15 years old on average ($SD = .83$), with the majority identified by their parent as Hispanic/Latino (40%) or Black (39%), followed by White (5%), or Other (16%); and 88% had some form of child health insurance. When examining the sample's utilization patterns in the last 12 months, only 0.9% ($n = 6$) of children had any hospitalizations, operations, or major illnesses, 65.3% ($n = 445$) had no ER visits, 19.8% ($n = 135$) had 1 ER visit, 11.3% ($n = 77$) had 2-3 ER visits, and 3.4% ($n = 23$) had 4 or more ER visits, and 9.4% ($n = 64$) of parents perceived that their child used more healthcare services than most children their age. When asked about care postponement, 7.8% ($n = 53$) of the sample identified that there was a time in the last 12 months that their child did not receive necessary medical care. Of those 53 participants, 69.8% ($n = 37$) reported why they did not take their child to get the healthcare services they needed, with the highest reported reason being that parents could not afford to pay for care ($n = 29$).

Child demographics and health insurance were also each examined individually by the independent variable, diagnosis (or lack) of a chronic. A t-test analysis revealed that child age did not differ when comparing the chronically ill ($M = 36.37$) and non-chronically ill ($M = 36.71$) groups, $t(572) = .23, p > .05$. A Pearson's chi-square analysis revealed that child gender also did not differ based on the diagnosis of a chronic illness, $\chi^2(1) = 2.35, p > .05$. Another Pearson's chi-square analysis revealed that health insurance status did not differ based on the diagnosis of a chronic illness, $\chi^2(1) = 3.27, p > .05$. However, the final Pearson's chi-square analysis revealed that child ethnicity was significantly different when comparing the chronically ill and non-chronically ill groups, $\chi^2(3) = 10.84, p < .05$ (see Table 1). When comparing the

ethnicity breakdown, there was a larger than expected representation of Latino and other children in the chronically ill as well as a smaller than expected group of Black children in the chronically ill group than should be based on chance. Small cell sizes within the chronically ill group by ethnicity (e.g., some groups only had 4 or 10 participants) did not allow for a dummy coded regression to be conducted.

Healthcare Utilization

The study hypothesis that children with a diagnosed chronic illness will have higher rates of healthcare utilization than expected based on chance and their parents will perceive their child's utilization rates as higher than expected was tested using three Pearson's chi-square analyses. In contrast, non-chronically ill children were hypothesized to have lower rates of healthcare utilization than expected based on chance. The independent variable in all three Pearson's chi-square analyses was the diagnosis (or lack) of a chronic illness while the three dependent variables of healthcare utilization were, over the last 12 months (a) did the child experienced of any hospitalizations, illnesses, or operations, (b) the number of ER visits the child had, and (c) the parental perceptions of their child's medical care, mental health, or educational service use. This hypothesis was partially supported by two of the three components of healthcare utilization. Children with a chronic illness nor children without a chronic illness nether differed significantly than chance expectations in their experiences of hospitalizations, operations, or major illnesses, $\chi^2(1) = .56, p > .05$. Children with a diagnosed chronic illness did have significantly more ER visits in the last 12 months than expected by chance and non-chronically ill children has significantly less ER visits than expected based on chance, $\chi^2(3) = 67.28, p < .001$ (see Table 2), Similarly, chronically ill children's parents' perception of their

healthcare utilization were significantly higher than expected and non-chronically ill children's parents' were significantly lower than expected by chance, $\chi^2(1) = 81.82, p < .001$.

Postponement of Care

The study hypothesis that children without a diagnosed chronic illness will have higher rates of parental postponement of care than expected based on chance and children with a chronic illness will have lower rates of parental postponement of care than expected by chance, when care was needed, was analyzed using a Pearson's chi-square analysis in which the independent variable was the diagnosis (or lack) of a chronic illness and the dependent variable was postponement of care; specifically, was a time when the child did not receive needed medical care in the last 12 months. This hypothesis was not supported. Children without a chronic illness nor children with a diagnosed chronic illness differed in their postponement of healthcare significantly less nor more than expected by chance, $\chi^2(1) = .77, p > .05$.

Of the participants that reported yes to care postponement in the last 12 months ($n = 53$), 69.8% ($n = 37$) reported why. Frequencies for each identified reason for postponing healthcare are reported in Table 3. The most frequently reported reason regardless of illness status was, "Couldn't afford to pay for care" ($n=29$). When analyzing the reported reasons why by the independent variable, the diagnosis (or lack) of a chronic illness, the most commonly reported reason for children with a chronic illness ($n = 5$) was, "Couldn't afford to pay for care," while only one reported another reason ("Couldn't get an appointment for your child soon enough"). This contrasted with the non-chronically ill group, which had several other reported reasons for care postponement.

Chapter V: Discussion

The goal of the current study was to examine the healthcare utilization and postponement patterns among preschool aged children living in poverty, while considering the variable of having a diagnosed chronic illness. Bronfenbrenner and Morris' (2006) Bioecological Model of Human Development, specifically the PPCT Model, was used to analyze how the person characteristic of having (or not having) a diagnosed chronic illness, the contextual factors of living in poverty in Urban Miami, Florida, and the impact of time, particularly being before the instatement of the ACA may be influencing the processes involved in children receiving necessary medical care. Previous literature has failed to consider the relationship of poverty and chronic illness on healthcare use solely among low-income samples; instead researchers have examined healthcare utilization across income levels, not providing a control of non-chronically ill children that also live in poverty in order to better understand impoverished children with a chronic illness (Arauz Boudreau et al., 2014; Houtrow et al., 2008; Huang et al., 2005; Kuo et al., 2011; Mayer et al., 2004; Ngui & Flores, 2006; Warfield & Gulley, 2006). Doing so may be painting an inaccurate picture of what is actually happening within families living in poverty. There has also been a lack of research exclusively on preschool aged children. This age-group is totally reliant on their parent or guardian to receive necessary medical care, therefore there is a need to understand what may be keeping these parents from getting their child to the doctor when it is needed (Russ et al., 2010; Schuster et al., 2011). Further explanations of the study's findings will be discussed in the following sections.

Healthcare Utilization

Based on previous literature, it was hypothesized that children with a chronic illness would have higher rates of healthcare utilization than expected by chance while their non-chronically ill peers would have lower utilization rates than expected by chance. Findings

indicated that two of the three components of healthcare utilization analyzed were different than expected for children with a chronic illness, partially supporting the study hypothesis.

Specifically, children with a chronic illness had significantly more ER visits over the prior 12 months than expected, supporting the study hypothesis. This was consistent with previous literature that has observed similar patterns when analyzing the rates of ER visits for (a) children with a chronic illness across income levels and (b) children living in poverty (Houtrow et al., 2008; Kuo et al., 2015; Larson & Halfon, 2010). Larson and Halfon (2010) described that children from low-income families are more likely to use the emergency department and less likely to utilize other non-emergency medical services than their peers from higher SES backgrounds. Similarly, Houtrow and colleagues (2008) and Kuo et al. (2015) both stated that the rate of ER visits for children with a chronic illness diagnosis are 2.4 - 2.5 times higher than non-chronically ill children. Findings from the current analysis support that in addition to the different rates of ER visits for children living in poverty, the diagnosis of a chronic illness is also linked with significantly different ER utilization for these children.

When examining this through the Bioecological Model the current findings suggest the person characteristic of having a chronic illness above and beyond living in poverty is playing a role in why this process of ER utilization looks different for children with and without a chronic illness diagnosis (Bronfenbrenner & Morris, 2006). With the entire sample living below the federal poverty line, the person characteristic of health status was the focus of the current investigation and seemed to be a driving factor in the significant differences in ER use. The current study differs from previous research which analyzed utilization across several systems of a child's surrounding environment such as the microsystem differences in high versus low SES and the availability of resources within the exosystem, as well as the role of time on policies

governing healthcare (Huang et al., 2005; Larson & Halfon, 2010; Mayer et al., 2004; Morrisey, 2012).

Parental perceptions of their child's healthcare use were also significantly higher than expected for children with a chronic illness. The increased medical needs of children with chronic illness diagnoses has been found to have an impact on parents as well as the child themselves (Schuster et al., 2011). As described by Schuster and colleagues (2011), parents who must take on the responsibilities of caring for and managing their chronically ill child's medical needs may feel a sense of burden which can create additional issues for the family in various systems within their environment. Examples can include marital or sibling conflict, complications at work or school, and increasing financial problems; all of which may increase these feelings of burden (Schuster et al., 2011). The current finding that parents of a chronically ill child perceive that their child is using significantly more medical services than expected may be a potential example of that burden. With these families having to deal with the struggles of living in poverty, the additional requirements of having a child with a chronic illness may be multiplying the burden they feel to ensure that their child's needs are being met, all while dealing with the emotional toll of having a child with an illness (Schuster et al., 2011). These perceptions are something future researchers could examine with feelings of burden to learn more about this possible relationship. When considering these differing parental perceptions through the Bioecological Model, Bronfenbrenner and Morris (2006) may describe that these feeling of parental burden could be emerging from the processes created through the reoccurring interactions with medical personnel. The child's person characteristic of having a chronic illness or not could be driving the differing processes surrounding healthcare utilization as discussed above. Therefore, the significantly higher than expected rates of healthcare utilization among

children with a chronic illness could be altering the perceptions held by parents about their child's use of medical services (Bronfenbrenner & Morris, 2006).

However, there were no differences from the chance expectations of both chronically ill and non-chronically ill children in their experiences of hospitalizations, operations, or major illnesses over the last 12 months. This finding was unexpected and opposes conclusions found in several other investigations. Previous researchers have found that children with chronic illness diagnoses face more and longer hospitalizations, acute illnesses, and operations than their healthy age-mates (Cohen et al., 2011; Dosa et al., 2001; Houtrow et al., 2008; Kuo et al., 2015; O'Mahony et al., 2013; Schuster et al., 2011; Silver & Stein, 2001). Specifically, when considering the number and length of hospital admissions, Houtrow and colleagues (2008) found that chronically ill children experience 3.1 times more hospitalizations that lasted on average 3.6 times longer than healthy peers, while Kuo et al. (2015) stated that children with a diagnosed chronic illness had up to 8.7 times more inpatient hospital stays than children without a chronic illness. Similarly, both Dosa and colleagues (2001) and Schuster et al. (2011) explained that when compared to children without a chronic illness, children with a chronic illness diagnosis are at a higher risk of developing serious acute illnesses which may require being admitted to the hospital or Pediatric Intensive Care Unit (PICU).

The current finding may be the result of what specific chronic illness the children in the sample are diagnosed with and confusion surrounding the difference between a hospital stay versus an ER visit in the questions asked. With varying degrees of severity within the population identified as having a chronic illness, different levels of medical requirements and needs exist meaning the utilization of healthcare services can also vary drastically (O'Mahony et al., 2013; Schuster et al., 2011; Warfield & Gulley, 2006). With these differences, it could be that none of

the chronically ill children within this sample required additional hospitalizations or operations, outside of their ER visit. There could have also been issues with the measure itself that may have led to confusion about how to answer it properly. Future researchers that use this type of self-report item in future should consider this possibility and approach analyses with caution. Finally, race and ethnicity of the sample could also be playing a part in the children's healthcare utilization. It has been found that minority families, specifically those identifying as Latino, African American, or multiracial, have more difficulties when trying to access or use medical services as well as face a higher risk for care postponement than their Caucasian counterparts (Huang et al., 2005; Mayer et al., 2004; Ngui & Flores, 2006). With the present sample being made up of largely minority children, their racial identity could be affecting their utilization in a way that was not accounted for in the current study's analyses. When considering this finding through the Bioecological Model, person characteristics that are not accounted for in the data, specifically the specific diagnosis of each child, may be playing a role in the lack of differences within this sample (Bronfenbrenner & Morris, 2006). As previously mentioned, the severity or specific diagnoses of the chronically ill subsample examined may not have allowed for enough variability to detect any significant differences (O'Mahony et al., 2013; Schuster et al., 2011; Warfield & Gulley, 2006). Also, the person characteristic of the children's racial and ethnic identities in this study may be swaying the findings surrounding healthcare utilization of hospitalizations, operations, and major illnesses (Bronfenbrenner & Morris, 2006).

Postponement of Care

When examining patterns of care postponement, the study hypothesis was not supported. There were no differences in postponement of needed medical care from chance expectations for both children with and without a diagnosed chronic illness. This finding was not anticipated, as

previous literature has explained that care postponement and unmet needs tend to look significantly different based on a chronic illness diagnosis and income, separately. When considering the diagnosis of a chronic illness on care postponement, prior researchers have consistently found that children with a chronic illness have more unmet needs through higher rates of care postponement than their healthy peers, regardless of SES (Houtrow et al., 2008; Huang et al., 2005; Mayer et al., 2004; Silver & Stein, 2001; Warfield & Gulley, 2006). Similar findings exist for children living in poverty, in that lower income levels are associated with more care postponement, foregone care, and unmet needs (Larson & Halfon, 2010; Newacheck et al., 2002; Reid et al., 2008). Considering these independent works together, a difference in the current study was expected; specifically, that among children living in poverty, children without a chronic illness would have higher rates of care postponement than chance expectations and children with a chronic illness diagnosis would have lower than expected by chance rates of care postponement.

Drawing from prior work may better explain why the current study's hypothesis differs from what other researchers have found. Based on prior research by Silver and Stein (2001) while chronically ill children and children living in poverty have more unmet needs than their peers, there can be a significant advantage in access and insurance coverage for chronically ill children living in poverty than both chronically ill and non-chronically ill children from higher income levels. Meaning that the access to medical services was higher for all children with a chronic illness, but unmet needs seemed to decrease as income level decreased; indicating chronically ill, low-income children had more access to care and less unmet needs than their more affluent chronically and non-chronically ill peers (Silver & Stein, 2001). Additionally, findings surrounding the consistency in where children receive their medical care may help explain the

current study non-significant postponement of care findings. Both Houtrow et al. (2008) and Silver and Stein (2001) have found that children with a chronic illness from low-income families were more likely to have a consistent source of where they received care than non-chronically ill children that also lived in poverty. When comparing this consistency across income levels, the only group without a steady source of healthcare were children living in poverty without a diagnosed chronic illness (Houtrow et al., 2008; Silver & Stein, 2001). This suggests that even while facing obstacles surrounding medical care, parents of children with a chronic illness that live in poverty are working to the best of their abilities to meet their child's medical needs.

Taken together, due to previous researchers consistently finding that differences in care postponement exist based on the characteristic of having or not having a chronic illness the current result that neither children with or without a chronic illness differed from chance in their rates of care postponement was unexpected (Houtrow et al., 2008; Huang et al., 2005; Mayer et al., 2004; Silver & Stein, 2001; Warfield & Gulley, 2006). This is an important contribution to this area of literature as it is the first to find that no differences existed in the rates of care postponement based on what was expected by chance for both children with and without a diagnosed chronic illness. This may be due to prior literature examining delayed care and unmet needs based on diagnosis and in different combinations across income levels. The current study only investigated postponement patterns among children with and without a chronic illness only living in poverty. In prior work, it may have been poverty that was driving the findings of higher rates of care postponement for chronically ill children than their more affluent non-chronically ill counterparts (Arauz Boudreau et al., 2014; Huang et al., 2005; Mayer et al., 2004; Ngui & Flores, 2006; Silver & Stein, 2001; Warfield & Gulley, 2006). Additionally, the current result may be providing support that even with increased medical needs, as seen with the findings

concerning where children are receiving their care, that parents of chronically ill children living in poverty are rising to the occasion when their child needs healthcare services (Houtrow et al., 2008; Silver & Stein, 2001). When examining this finding through the Bioecological Model, a unique relationship between the person characteristic and context emerges (Bronfenbrenner & Morris, 2006). Having a chronic illness, without considering the context in which a child lives, has been linked with more care postponement (Houtrow et al., 2008; Huang et al., 2005; Mayer et al., 2004; Silver & Stein, 2001; Warfield & Gulley, 2006). However, when analyzing this association within the context of poverty, the person characteristic of having a chronic illness or not seems to no longer be influencing differing processes when it comes to delaying medical care (Bronfenbrenner & Morris, 2006).

When further examining the reasons for care postponement, parents of children without a chronic illness identified several reasons for their child not receiving required medical care such as: “you couldn’t get through on the telephone,” “you couldn’t get an appointment for your child soon enough,” “once there your child had to wait too long to see the doctor,” “the clinic or doctor’s office wasn’t open when you got there,” and “you couldn’t afford to pay for care.” This was very different than the reasons reported by parents with a chronically ill child, which consisted of “you couldn’t afford to pay for care” with only one individual reporting a different reason for care postponement; which was “you couldn’t get an appointment for your child soon enough.” Frequencies of the most commonly reported reason why, or the inability to afford paying for care, was consistent with previous literature that has investigated explanations for care postponement (Huang et al., 2005). Specifically, Huang and colleagues (2005) found that parents most commonly identified financial problems, such as “did not have money to pay provider” or “type of care not covered by health plan,” as justification for foregoing or postponing their

child's medical care. These reasons for care postponement are examples of contextual factors within various systems of a child's environment that may be influencing the process of necessary interactions between a child and a doctor (Bronfenbrenner & Morris, 2006).

Limitations and Future Directions

While the current study expanded on current gaps in the literature on links between chronic illness, poverty, and healthcare utilization and postponement, there are several limitations that must be taken into consideration. Along with discussion of these limitations, suggestions for future studies analyzing these variables are discussed.

A significant limitation to consider is the design of the current study which utilized secondary data analyses of self-reported measures. Utilization of self-reported measures can increase the risk of reporter bias which could skew the findings. Future researchers could collect more specific data utilizing multiple sources of reporters to ensure the most accurate information regarding healthcare utilization and postponement is being examined; for example, collecting information about hospitalizations or ER visits from patient's medical records with proper authorization would provide more accurate evidence of utilization than self-reports. An additional concern is the limited generalizability of this sample. Due to the high number of Hispanic/Latino individuals in this sample, these findings may not be replicated with samples of children from other ethnic backgrounds. Another issue with generalizability may stem from the context in which the sample was recruited. Children living in other areas of the country may be facing very different barriers to healthcare based on the resources accessible to them. Future studies could try recreating a similar study in a rural area or in another region of the United States.

In addition, the data used for the current study was collected prior to the instatement of the ACA in the United States. As previously discussed, several improvements to the healthcare

system occurred after passing the ACA, therefore findings surrounding healthcare utilization may look very different now. Future researchers should analyze these same variables now that the ACA has been in place for several years to examine if having more accessible health insurance has altered utilization or postponement patterns. Previous literature that has considered the changes to the healthcare system since the ACA have found that more Americans are eligible for and enrolling in some type of health insurance, has improved the quality of insurance coverage, and enhanced the focus on prevention efforts and chronic illness management (Morrissey, 2012). The ACA has also created more avenues for research on measuring the quality of health outcomes, thus, recreating similar examinations to this study could provide additional insight into the potential benefits discussed as accompanying the ACA (Morrissey, 2012).

Due to the limitation of utilizing a pre-existing the data set, there was no way to consider the varying levels of medical complexity or care regimens that may be influencing the chronically ill children's healthcare needs or utilization. Rates of utilization can vary drastically depending on a child's specific diagnosis, severity, and care requirements. Children with more severe or complex chronic illnesses and those with inconsistent medical requirements typically have more multifaceted healthcare needs as well as higher utilization rates (O'Mahony et al., 2013; Schuster et al., 2011; Warfield & Gulley, 2006). Past literature has revealed a relationship between high levels of required medical services and unmet needs for children with severe or complex chronic illnesses varying by degree of severity (Warfield & Gulley, 2006). Lower levels of satisfaction and more difficulties utilizing necessary care have also been linked with instability of needs, regardless of illness severity (Kuo et al., 2015; Ngui & Flores, 2006). Children with the most severe chronic illness diagnoses tend to have more unmet routine needs,

while those with milder illnesses have higher rates of unmet specialized needs (Mayer et al., 2004). Diagnoses that include functional limitations (i.e., restrict daily activities) tend to have more unmet needs than those without these concerns (Huang et al., 2005). Without considering these differences, there is likely a large variance of diagnoses and medical requirements when applying such a broad conceptualization of the term chronic illness.

Utilizing the Bioecological Model of Human Development with single-time point secondary data in the current study presented another limitation. Due to restrictions in the data that was available, examining the processes occurring in these children's lives overtime regarding how they may influence their ability to access and/or use necessary medical care was not possible. As discussed by Tudge et al. (2016) to properly use Bronfenbrenner and Morris' (2006) model, researchers must be able to examine interactions over time. Future studies should consider this element of the Bioecological Model when examining the links between chronic illness, poverty, and healthcare utilization and postponement.

Finally, two additional future directions should be considered. It would be beneficial to examine these same variables with older samples of children based on conclusions from previously literature. It has found that older children and adolescents tend to have more chronic illness diagnoses as well as increasing rates of unmet needs (Dosa et al., 2001; Huang et al., 2005; Kuo et al., 2015; O'Mahony et al., 2013; Mayer et al., 2004; Warfield & Gulley, 2006). Also, when investigating healthcare utilization and postponement among young children it may be valuable to consider the influence of parental person characteristics, such as educational attainment, knowledge of child's needs, mental health status, and primary language on their ability to get their child the medical services they need (Gaskins & Mitchell, 2005; Kuo et al., 2015; Mayer et al., 2004; Ngui & Flores, 2006; Porterfield & McBride, 2007). Previous literature

has stated that chronically ill children of mothers with lower levels of educational attainment are more likely to have higher rates of unmet needs and their mothers are less likely to identify that their child needs specialized or advanced medical treatments (Mayer et al., 2004; Porterfield & McBride, 2007). In addition, less educated mothers as well those whose primary language is not English, are more likely to face difficulties accessing healthcare for their child and have lower satisfaction with the care their child receives than English speaking mothers (Ngui & Flores, 2006). Maternal mental health status has also been found to influence their ability to meet their chronically ill child's healthcare needs. Specifically, children with a chronic illness with mothers who have experienced depressive symptoms were found more likely to have higher rates of unmet needs for a variety of medical services (Gaskins & Mitchell, 2005).

Conclusions

Due to the elevated rates of both utilization of a variety of healthcare services as well as postponed or foregone medical care associated with a child having a chronic illness diagnosis and living in poverty, it was imperative that work be done examining children that live with both (Cohen et al., 2011; Cohen et al., 2012; Houtrow et al., 2008; Huang et al., 2005; Larson & Halfon, 2010; Newacheck et al., 2002; Reid et al., 2008; Silver & Stein, 2001; Warfield & Gulley, 2006). Being able to distinguish what elements of these children's lives may be influencing this medical vulnerability and their constant interactions with the healthcare community can play a key role in developing supports to ensure that all required medical needs are being met. The current examination contributes to this area of research by confirming that when investigating with a sample of children who all live in poverty, significant differences still exist in the number of ER visits for both children with and without a chronic illness compared to what is expected by chance (Dosa et al., 2001, Houtrow et al., 2008; Kuo et al., 2015; O'Mahony

et al., 2013). It also supports what past researchers have found concerning the justifications parents give for why they did not take their child to seek medical care when it was needed (Huang et al., 2005; Mayer et al., 2004; Warfield & Gulley, 2006). Knowing what processes and barriers are keeping children and their parents from accessing healthcare settings when necessary provides evidence for where policymakers need to focus their attention and funding. Considering the findings from this study, future researchers can begin to focus on the role parental person characteristics may be playing on their abilities or willingness to seek healthcare services for their chronically ill child (Gaskins & Mitchell, 2005; Kuo et al., 2015; Mayer et al., 2004; Ngui & Flores, 2006; Porterfield & McBride, 2007). Additionally, it would be beneficial to consider the time component of the Bioecological Model and re-assess these same relationships now that the ACA has improved access to health insurance in the United States (Morrisey, 2012).

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Table 1

Race and Ethnicity Breakdown by Chronic Illness Group

Race and Ethnicity	Chronic Illness	No Chronic Illness	Total
Caucasian	4 (11%)	32 (89%)	36
Expected	4.8 (13%)	31.2 (87%)	
Latino	25 (10%)	236 (90%)	261
Expected	34.6 (13%)	226.4 (87%)	
Black	48 (19%)	209 (81%)	257
Expected	34.1 (13%)	222.9 (87%)	
Other	10 (10%)	92 (90%)	102
Expected	13.5 (13%)	88.5 (87%)	
Total	87	569	656

Note. $\chi^2(3) = 10.84, p < .05$

Table 2

Number of ER Visits by Chronic Illness Group

Number of Visits	Chronic Illness	No Chronic Illness	Total
None	35 (8%)	410 (92%)	445
Expected	56.9 (13%)	388.1 (87%)	
1 Time	19 (14%)	116 (86%)	135
Expected	17.3 (13%)	117.7 (87%)	
2 - 3 Times	19 (5%)	58 (75%)	77
Expected	9.9 (13%)	67.1 (87%)	
4 or More Times	14 (61%)	9 (39%)	23
Expected	2.9 (13%)	20.1 (87%)	
Total	87	593	680

Note. $\chi^2(3) = 67.28, p < .001$

Table 3

Care Postponement Reasons by Chronic Illness Group

Reason for Postponement	Chronic Illness	No Chronic Illness	Total
Couldn't Get Through on the Telephone	0 (0%)	3 (100%)	3
Couldn't Get an Appointment Soon Enough	1 (20%)	4 (80%)	5
Once Arriving, Had to Wait Too Long to See Doctor	0 (0%)	4 (100%)	4
Clinic Wasn't Open When Arrived	0 (0%)	1 (100%)	1
Didn't Have Transportation	0 (0%)	0 (0%)	0
Couldn't Afford to Pay for Care	4 (14%)	25 (86%)	29
Total	5	37	42

Note. There are more total responses than participants who reported reasons why due to some participants selecting more than one reason.