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**Factors that influence mental health services utilization by children
who have experienced adversity**

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of
Philosophy at Virginia Commonwealth University.

by

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ABSTRACT

FACTORS THAT INFLUENCE MENTAL HEALTH SERVICES UTILIZATION BY CHILDREN WHO HAVE EXPERIENCED ADVERSITY

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A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at Virginia Commonwealth University.

Virginia Commonwealth University, 2019.

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Adverse childhood experiences (ACEs) are linked to increased mental health problems in children, but their association with mental health services utilization is not well known. This secondary analysis used 2016 National Survey of Children's Health data from two samples: children aged 6-17-years-old with a mental or behavioral condition in need of treatment or counseling ($N = 5,723$); and a subsample of children who experienced at least one ACE ($n = 3,812$). Multiple logistic regression and latent class analysis (LCA) were performed to examine the association between ACEs and mental health services utilization. Multiple logistic regressions also examined the associations of parent/caretaker vulnerability, school-system, and medical-system factors on mental health services utilization for children with ACEs using the Gelberg-Andersen Behavioral Model for Vulnerable Populations and a Systems of Care approach as the framework for model building. Children with increased ACE scores did not have higher odds of utilizing mental health services compared to children at lower levels of or no ACEs. For children who experienced adversity, increased parent/caretaker vulnerability was associated with lower odds and the current receipt of special education services with increased odds of mental health services utilization in adjusted models. Strengths of this study included the large dataset and generalizability to the

U.S. population. There were limitations to the measurement of ACEs and other key variables. The current study identified children who experienced adversity as an underserved population for mental health services.

CHAPTER 1

Introduction

This study examines the relationship between experiencing childhood adversity and utilizing mental health services for children aged 6- to 17-years old in the United States (U.S.) population, and in the subset of children who have experienced adversity, whether parent/caretaker factors and school- and medical-system factors are associated with mental health services utilization. Chapter 1 lays the foundation for understanding the problem that this study seeks to address. Three topics are described: (1) the large disparity between needing and receiving mental health services for all children in the U.S.; (2) the increased mental health service need for children who have experienced adversity; and (3) the relationship between childhood adversity and mental health services utilization. Chapter 1 also introduces the two theoretical frameworks that guide the study: the Gelberg-Andersen Behavioral Model for Vulnerable Populations and the Systems of Care approach for mental health services for youth.

Statement of the Problem

Children's Unmet Mental Health Needs

Most children with mental health needs do not receive services. Each year up to 20% of children, aged from 3-17 years old, in the U.S. have a diagnosable mental illness. The majority of these children have a serious emotional disturbance, defined as a diagnosable mental, behavioral or emotional disorder that causes substantial impairment on a child's functioning in family, school or the community. Only one in five of those children receive the mental health services needed to help alleviate their symptoms (Centers for Disease Control and Prevention, 2013). And for children with any mental health disorder, it is estimated only one-third receive treatment (Costello, He, Sampson, Kessler, & Merikangas, 2014).

This lack of treatment has detrimental effects on the child, family and society at-large. Children and adolescents with untreated mental health problems, compared to those who received and completed treatment, are significantly more likely to be involved in criminal acts, substance abuse, and other high-risk behaviors (Lochman & Salekin, 2003; Moffitt, Caspi, Harrington, & Milne, 2002). They are also more likely to commit suicide, which was the second leading cause of death among children aged 10-19 years in 2015 (Heron, 2017). When mental health problems are left untreated, children are more likely to have school failure which, as adults, is associated with higher rates of unemployment or underemployment and poverty (Grimes, Kapunan, & Mullin, 2006; Shaw et al., 2012). As adults, they also have higher rates of mental disorders, antisocial behavior and substance abuse compared to those who completed treatment in childhood (Benjamin, Harrison, Settapani, Brodman, & Kendall, 2013; Shaw et al., 2012).

Adverse Childhood Experiences and Outcomes

Children who have experienced adversity are a population that may be especially vulnerable to needing mental health services. Adverse childhood experiences (ACEs) are traumatic or stressful occurrences before the age of 18 years that are physically or emotionally harmful or threatening and are related to the development and prevalence of a wide range of health and mental health problems throughout a person's lifespan (Substance Abuse and Mental Health Service Administration, 2018). These events of childhood include not only harmful acts directed toward the child such as physical, sexual or emotional abuse, but also familial and socio-environmental influences such as parent separation or divorce, parent incarceration, death of a parent, parent substance abuse or mental illness, witnessing violence, and poverty (Felitti et al., 1998). Bethell, Newacheck, Hawes, and Halfon (2014) found that nearly half of all children

in the U.S. have experienced at least one ACE, while nearly one quarter have experienced at least two. Data from the National Survey of Children's Health (NSCH) in 2012 showed that three quarters of children aged 6- to 17-years with emotional, mental or behavioral diagnoses have experienced at least one ACE (Bethell et al., 2016).

Adverse childhood experiences and long-term outcomes have been studied extensively over the past two decades beginning with a study conducted by Felitti and colleagues (1998) in a partnership between Kaiser Permanente and the Centers for Disease Control. These researchers conducted a retrospective study that asked adults if they experienced certain negative events in their childhood and explored the potential effects of these events on current health-related factors. Research evidence suggests that ACEs have negative long-term impacts on a person's physical and emotional health and well-being. These experiences have been consistently linked to many problems in adulthood such as depression and suicide (Chapman et al., 2004), substance abuse (Dube, Anda, Felitti, Edwards, & Croft, 2002), premature death (Benoit, Dominique, Bartley, Blane, & Grosclaude, 2013), and chronic health problems (Chartier, Walker, & Naimark, 2010). ACEs have a cumulative effect, in that as a person experiences more categories of ACEs (often referred to as a person's ACE score) there is a greater likelihood of negative outcomes. If a person has experienced at least four ACEs during childhood, the likelihood of negative outcomes and the severity of those outcomes grows exponentially (Felitti et al., 1998).

While many studies of ACEs have been retrospective reports from adults of their past childhood experiences and current health and well-being, more recently studies have sought to identify evidence that ACEs have an effect during childhood. Each category of ACEs (child abuse and neglect, domestic violence, parent substance abuse and mental illness, living in poverty, community violence and peer victimization) has been independently associated with a

higher prevalence of chronic physical conditions, mental health problems and/or developmental delays in children (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Bright et al., 2016; Flouri & Kallis, 2011). Cumulative ACEs also are associated with multiple problems in children, including decreased overall well-being, mental health, violence perpetration, and substance abuse (Appleyard et al., 2005; Balistreri, 2015; Bright et al., 2016; Duke, Pettingell, McMorris, & Borowsky, 2010; Forster, Gower, Borowsky, & McMorris, 2017; Garrido, Weiler, & Taussig, 2018; Hunt, Slack, & Berger, 2017).

Adverse childhood experiences affect children of all ages. Increased chronic medical problems, mental health issues and social problems are observed even in young children. In a study of children aged 18 to 71 months in the child welfare system, for every additional ACE reported, there was 32% increased odds of having a behavioral or mental health problem, 21% increased odds of having a chronic medical condition and 77% increased odds of social problems (Kerker et al., 2015). Balistreri (2015) utilized NSCH data and found that as a child's total ACE score increased, child physical and emotional health declined among children aged 6 to 17 years old. And in another study using NSCH data, the prevalence of poor health and emotional problems in adolescents aged 12 to 17 years increased with higher cumulative ACE scores, and each specific ACE was related to a higher prevalence of poor health or emotional problems compared to adolescents who had not experienced ACEs (Balistreri & Alvira-Hammond, 2015).

Cumulative ACEs are associated with children's overall well-being. Child well-being measures four developmental domains: physical health, psychological health, social health, and education achievement and cognitive development. One population study showed that as the number of ACEs experienced increased, the level of child well-being decreased (Balistreri, 2015). There was also a greater likelihood of having multiple conditions for children who have

experienced adversity. Bright and colleagues (2016) conducted a population-based study using NSCH data, looking at the comorbidity of physical, mental and developmental conditions in youth associated with ACEs. They found that the likelihood of having at least one health condition (i.e., physical, mental or developmental) was higher for children with at least one ACE than for children with no ACEs. An increased ACE score was associated with a greater likelihood of having at least one condition, with the strongest association, of the three conditions, being with mental conditions. Finally, they found a positive association between the ACE score and the likelihood of comorbid conditions. Specifically, compared to children with no ACEs, children who experienced one ACE were 2.34 times more likely, two ACEs were 3.86 times more likely, and three or more ACEs were 9.49 times more likely to have experienced comorbid conditions.

There are also numerous studies of children's mental health and adversity. Children who experience ACEs are more likely to experience a mental health condition (i.e., attention deficit/hyperactivity disorder (ADHD), attention deficit disorder (ADD), depression, anxiety problems, and behavioral or conduct disorder) than children who have not experienced adverse events, and those children who have experienced at least three ACEs are almost five times as likely to experience a mental health condition (Bright et al., 2016). A small study of at-risk urban youth ($n = 171$) examined cumulative ACEs on adolescent behavioral outcomes and showed support for the association between higher ACE scores and increased internalizing and externalizing mental health problems as measured by the Child Behavior Checklist (Appleyard et al., 2005). Additionally, children who have experienced adversity are at increased risk for more severe mental health problems. Hunt, Slack, and Berger (2017) recently conducted a study using data from the Fragile Families and Child Wellbeing Study examining adverse experiences and

subsequent mental health problems of over 3,000 children in middle childhood. They found a strong association between exposure to childhood adversity and the level of mental health problems children demonstrated at nine years of age. Children who experienced three or more ACEs were more likely to display mental health symptoms at levels warranting professional attention compared to children with two or fewer ACEs. Brown, Brown, Briggs, Belamarich, & Oyeku (2017), in their study using NSCH data, showed children who experienced at least one ACE were more likely to have their condition rated more severely by their parent or caretaker than children who had not experienced an ACE.

Other studies have focused solely on externalizing mental health conditions and childhood adversity. Externalizing mental health conditions include those conditions in which the child exhibits behavior problems that are outwardly directed on the external environment (Liu, 2004). These negative behaviors consist of disruptive, hyperactive and aggressive behaviors. Children who have experienced ACEs are more likely to have an externalizing condition than children who have not experienced an ACE; this relationship showed a dose effect in that as a child experienced more ACEs, the likelihood of having an externalizing condition also increased (Hunt et al., 2017). In a study of 171 predominantly disadvantaged adolescents in the United Kingdom an association between ACE score and hyperactivity and conduct problems was found (Flouri & Kallis, 2011). This relationship was also shown across a wider range of child ages. In a U.S. population-based study of children, 4 to 17 years old, a graded relationship was found between ACE score and parent-reported ADHD and ADHD severity (Brown et al., 2017).

Cumulative ACEs also affect violence perpetration. Duke, Pettingell, McMorris, and Borowsky (2010) conducted a study using data from 136,549 middle and high school students in

Minnesota who took an anonymous, self-report survey. They found adolescents with higher ACE scores had a higher risk of interpersonal violence perpetration (i.e., delinquency, bullying, physical fighting, dating violence, weapon-carrying on school property). Adolescents with higher ACE scores also showed higher risk of self-directed violence (i.e., self-mutilatory behavior, suicidal ideation, and suicide attempt). For every unit increase of the ACE score (i.e. zero, one, two, three, or four or more) reported by youth, the risk of violence perpetration increased 35% (i.e., for one ACE) to 144% (i.e., for four or more ACEs) (Duke et al., 2010).

Substance abuse issues in adolescents have also been associated with higher ACE scores. A study utilizing the 2013 Minnesota Student Survey ($N = 104,332$), which surveys middle- and high-school students, showed that each additional ACE was associated with an increase in the odds of past year non-medical use of prescription medications. Specifically, there was a 47% increased odds of use of pain relievers, 51% increased odds of ADHD medication, 52% increased odds of tranquilizer use and a 56% increased odds of stimulant medication use (Forster et al., 2017). Also, in a study of 9- to 11-year-olds placed in foster care, ACE scores were predictive of substance use more broadly (e.g., smoking cigarettes, using marijuana, drinking alcohol, using inhalants, using methamphetamines), with a 50% increase in the likelihood for engaging in substance use for each one-unit ACE increase (Garrido et al., 2018).

ACEs and Mental Health Services Utilization

The above research is clear: there is an increased need for mental health services for children and adolescents who have experienced adversity. However, there are fewer studies looking at the relationship between childhood adversities and mental health services utilization. For adults, studies show increased utilization for those who experienced adversity as a child. For example, Mills, Van Hooff, Baur, and McFarlane (2012) used a comprehensive model of

predisposing, enabling and need factors to examine mental health services utilization in adults who experienced ACEs from a rural region of South Australia. In this study of 822 participants, ACEs were positively associated with the use of a mental health specialist. An additional study conducted by Anda, Brown, Felitti, Bremner, Dube and Giles (2007) found increased general psychotropic medication use for adults who experienced ACEs. This study compared participant's ACE score from an earlier study to rates of prescribed psychotropic drugs among 15,033 adults in the follow-up phase approximately six years later. They found prescription rates increased yearly and in graded fashion as ACE scores increased, and those with an ACE score of five or higher had a nearly threefold increase in rates of psychotropic prescriptions.

In children, studies that examine the relationship between mental health services and cumulative ACEs are limited. To date, these studies are primarily in certain populations, such as children who have been in contact with the child welfare system or are part of a particular program or age group, rather than children among the general population. These studies show mixed results, which are somewhat dependent on the type of adverse event experienced and the population examined. For example, factors such as child maltreatment are associated with increased rates of mental health service utilization for children involved in the child welfare system. This is in contrast to other studies of ACEs related to family dysfunction such as parent psychopathology and substance abuse, which are associated with higher *unmet* mental health service need for children in the general population (Cornelius, Pringle, Jernigan, Kirisci, & Clark, 2001; Farmer et al., 2010; Horwitz et al., 2012; Owens et al., 2002).

Studies using the National Survey of Child and Adolescent Well-being II (NSCAW-II) data show increased mental health services utilization for children whose families have high levels of current adverse childhood experiences (substance abuse, mental illness, poor parenting,

domestic violence, trouble meeting basic needs) (Farmer et al., 2010; Horwitz et al., 2012). However, these studies include children who are in contact with the child welfare system because of an investigation of child maltreatment. This contact may act as a facilitator for service use given their interaction with professionals who can assess for past trauma and current mental health need (Farmer et al., 2010; Horwitz et al., 2012).

Studies on children other than those involved in the child welfare system show different outcomes. In a study of 799 children enrolled in first, sixth and seventh grade in a school system with a school-based prevention program designed to reduce early risk behaviors for later substance abuse and affective and conduct disorders, difficulties in parenting and parent stressors were associated with barriers to mental health treatment for children who needed services (Owens et al., 2002). Parenting difficulties and stressors are highly correlated and also overlap with ACEs (e.g., divorce, experiencing domestic violence, financial difficulties). Also, a longitudinal study of 196 adolescent males and their biological parents was conducted at the Center for Education and Drug Abuse Research in Pittsburg (Cornelius et al., 2001). The families were divided into two groups: fathers who met criteria for a substance use disorder and those whose fathers did not. This study found that while mental health treatment for the adolescent was twice as common in the group of youth whose father had a substance addiction, they were also two thirds more likely to report an unmet mental health need. This study also showed parental psychopathology associated with increased unmet need for mental health services in this population (Cornelius et al., 2001), which could point to an increased need for mental health care among children whose parents have comorbid substance use and psychiatric disorders.

Parental psychopathology was shown to increase mental health service utilization for children in a separate study that analyzed data from the Great Smokey Mountains Study of Youth (GSMS), which was a longitudinal population study of youth in rural North Carolina (Burns et al., 1995; Farmer, Stangl, Burns, & Costello, 1999). Researchers showed that children who had a parent with psychiatric problems were more likely than other children to receive treatment through the specialty mental health system. This may be related to the increased mental health need of children who have a parent with a psychiatric disorder, as need is a major driver for children getting treatment (Burns et al., 1995; Farmer et al., 1999; Owens et al., 2002). It could also be that the school-system is a major access point for children to get services. Most children in this study who did receive mental health services did so within the school-system, primarily through a school counselor (Farmer et al., 1999).

Mental health service utilization for children with mental health needs is complicated because children typically do not refer themselves and, unlike adults, rely on their caretakers to initiate and maintain them in services. Given that familial factors are embedded in the definition of ACEs, children who have experienced adversity may be less likely to receive the services they need. However, children are also involved in larger systems that can act as gatekeepers, directing children to needed services. Children's adverse experiences could bring them to the attention of other adults who could facilitate service utilization as seen in studies related to child welfare and those using GSMS data (Farmer, Burns, Phillips, Angold, & Costello, 2003; Stiffman, Pescosolido, & Cabassa, 2004). These systems of care, beyond the family, include schools, medical professionals, child welfare and criminal justice, and have been shown to increase service utilization in children who come into contact with them (Horwitz et al., 2012; Messer et al., 2008; Stiffman et al., 2004). After family, professionals from these systems often

have the first official contact with the youth, may identify the problem and either provide some immediate services or refer the youth and act as a liaison to mental health services which, in turn, has been shown to increase access to mental health care (Stiffman et al., 2004).

Statement of Purpose and Significance

The research examined in the above sections show that experiencing adversity in childhood is common. Studies also have established that children are not getting the mental health services that they need, and those children who have experienced adversity and especially those with cumulative ACE scores are more likely to have a mental health need and increased severity of the mental health condition. However, several unanswered questions remain. First, are children who have experienced ACEs receiving mental health services, and are they receiving services at a different rate compared to other children with a need for services? Second, what factors help or hinder children with ACEs to receive needed mental health services? Adversity could act as a barrier to seeking treatment because of family dysfunction or it could act as a facilitator by bringing children to the attention of systems that can enable access to mental health services.

How adversity and other family and systems factors may differentially affect service utilization for these vulnerable children remains unclear. Research shows different results for mental health services utilization for children based on the type of adversity experienced. Family factors such as parent stress act as barriers by decreasing mental health services utilization. However, for children who have come to the attention of professionals, such as through child welfare system, there is some evidence to show increased utilization of mental health services for children (Farmer et al., 2010; Horwitz et al., 2012). Factors related to the role of ACEs and other parents/caretaker factors and the influence of the systems in which children

are involved needs further exploration, including in the U.S. general population, in order to understand the likelihood that children who have experienced adversity will receive needed mental health services.

As such, this study has potential significance for social work and the vulnerable populations we seek to help. Social work acts through a systems and social justice lens. Finding ways to increase access to mental health services for children in need, and especially for children who experience increased risk of need and potential barriers to accessing services is necessary to enhance the well-being of children. This is important, because of not only their need as children, but also their increased service need as adults. Intervening in childhood could reduce the negative emotional and developmental impacts of adversity and prevent consequences later in the lifespan. Involvement in and completion of mental health intervention services are key indicators for child improvement in social, emotional and behavioral functioning (Cunningham & Henggeler, 1999; Liddle, 1995; Prinz & Miller, 1994; Richards, Bowers, Lazicki, Krall, & Jacobs, 2007) and lack of treatment adherence is associated with poor therapeutic child and family outcomes (Nock & Kazdin, 2005). A comprehensive examination of the relationships of family and other system factors for children with ACEs and how these factors may predict mental health service utilization for children is imperative to inform policy and practice to best provide services to children in need.

Recently, in social work policy, there has been increased focus on prevention and reducing the duration of time that youth live with untreated mental illness. One key initiative, as outlined in the *Grand Challenges for Social Work Policy Recommendations for Meeting the Grand Challenge to Ensure Healthy Development for all Youth*, includes advocating for policies that promote universal preventive interventions (Hawkins et al., 2016). The goal is to raise

awareness of children's emotional and behavioral needs in order to reduce the length of time it takes youth to get into treatment. The current study can inform this effort by determining how children with ACEs do get into treatment and where the gaps are in our ability to identify children in need and facilitate their access to services. This, in turn, can help to target resources to raise awareness of the mental health needs of children where it is needed, which could be in systems that come into contact with all children (e.g., school and medical systems) as they are poised to identify any child in need. School and medical systems see a broader range of children, which is different from children involved in the child welfare or juvenile justice systems who likely have increased need by the time professionals come into contact with them (Lyons & Rogers, 2004; Maschi, Smith, Schwalbe, & Scotto, 2008; Rogers, Zima, Powell, & Pumariega, 2001).

Schools have been increasingly recognized as an optimal setting for providing prevention services and promoting well-being, but also in identifying and providing supports to children in need (Atkins, Cappella, Shernoff, Mehta, & Gustafson, 2017; Hogan, 2003). School systems can decrease disparities in mental health service use as they are more accessible than community-based services and are perceived as more acceptable by families (Atkins et al., 2017; Farmer et al., 2003; Sanchez et al., 2018). Further, Moon, Williford, and Mendenhall (2017) conducted a study of 786 educators in a midwestern state. They found that more than half of respondents felt confident in recognizing signs of a student's mental health issues and were confident in making a referral to the appropriate school professional. Almost half also agreed, however, that they have not received adequate mental health training.

There has been similar focus on the medical system as a place to universally screen and identify children who may be in need of mental health services because of their reach across all

children in the U.S. beginning at birth. Pediatricians and family physicians are encouraged by the American Academy of Pediatrics (AAP) to develop skills in the diagnosis and treatment of childhood mental health problems, specifically focused on prevention and early detection and intervention (Houston & Martini, 2013). Under the Affordable Care Act, health plans must cover preventative care and screenings provided for in the *Bright Futures* guidelines of the AAP. These guidelines call for developmental screenings at 9, 18 and 30 months and psychosocial and behavioral assessments at every visit (Cole, Lerner, & Mann, 2011). Additionally, the AAP, National Academy of Medicine, the American Board of Pediatrics have all advocated for integrating mental health with the rest of pediatric health care to promote prevention and early intervention through policy and legislative changes (Perrin, 2018).

The abovementioned Grand Challenges for Social Work brief also called for policies that strengthen interdisciplinary, cross-system collaboration among the health, education, social, protection and justice systems that provide services to youth (Hawkins et al., 2016). This was recommended to establish effective programs that decrease the incidence and prevalence of behavioral health problems in young people. As is the aim of this study, gaining a broader understanding of the factors that affect mental health service utilization in youth and the impact systems have on treatment access can inform social work policy and practice to target resources to the areas that can strengthen access to services for these children. Social workers, medical professionals, and educators all agree, and support the coordination of systems and different disciplines to meet the mental health needs of children (Atkins et al., 2017; Larkin, Felitti, & Anda, 2014; Lawson, Bloom, Sadof, Stille, & Perrin, 2011; Perrin, 2018). This study can assist in determining where enhanced collaboration is needed to strengthen the resources to assist children in accessing needed care.

Theoretical Approach

This study uses the Gelberg-Andersen Behavioral Model for Vulnerable Populations to examine the factors that facilitate or act as barriers to receiving mental health services for youth who have experienced adversity. This model has been used extensively to study health behaviors of different vulnerable populations, and encompasses multiple child and family predisposing, enabling and need factors that may influence service utilization for children. Additionally, this study explores the role of systems in facilitating mental health service access. Systems of Care is a theoretical approach used in policy-making and programming for children's mental health service access. Its underpinnings lie in the basic assumption that the systems within which children are a part of are key partners in facilitating service utilization for children in need. Systems are, at their basic core, a set of elements that are interrelated and work together to make a functional whole (Kirst-Ashman & Hull, 2009). These systems can act as potential enabling factors within the Gelberg-Andersen model.

Model of Mental Health Services Utilization

The Gelberg-Andersen Behavioral Model for Vulnerable Populations is an extension of prior work by Ronald Andersen and others. In the 1960s, Andersen (1968) proposed a behavioral model to explain and predict the various patterns of health care utilization. This model uses a social structural perspective, which suggests that service use is a function of predisposition by people to use services, factors that enable or impede use and people's need for care. Essentially, the model posited that health service utilization occurs when (1) a person is predisposed to receive medical care, primarily through individual and family characteristics; (2) enabling resources are available which results in the ability of a person to obtain services; and (3) the person perceives the need for care (Andersen, 1995; Babitsch, Gohl, & von Lengerke, 2012).

These three components are described as follows, with the definitions and descriptions provided coming from Andersen's 1968 model as well as later revisions:

- *Predisposing factors* are the tendency of families to seek medical care, based primarily on individual and family characteristics. These characteristics were placed in three subcategories: family composition, social structure, and health beliefs. Family composition was comprised of family demographic variables including age, sex, marital status of the parent/caretaker, family size, age of the oldest family member, and age of the youngest family member (Andersen, 1968). These were chosen, according to Andersen, to represent the 'biological imperatives of the family', or the likelihood the family may need health services (Andersen, 1995). Social structure factors included the family's lifestyle and the societal position. Social structure was comprised of: employment status, occupation, social class, education level of the parent/caretaker, race, and ethnicity. Andersen posited these factors represented the family's ability to cope and utilize available resources for solving problems (Andersen, 1995). The final subcategory, health beliefs, was defined as the attitudes, values and knowledge that may influence families when making decisions about health-related issues. This subcategory was comprised of the value the family placed on each of the following: health services, physicians, good health, health insurance; attitudes toward health services and physician use; and knowledge of disease (Andersen, 1995).
- *Enabling factors* include the availability of health services and the ability of families to obtain these services (Andersen, 1968). These included individual and family resources including income and wealth, savings, health insurance and a regular source of care. Enabling factors also included community and system factors such as per capita

community income, providers per capita, public health services in the region and health policies (Andersen, 1968).

- *Need factors* were recognized by Andersen to be one of the strongest predictors of health service utilization. This domain included both perceived need and evaluated health needs. Perceived need is defined as how the decision-makers of the family view and experience their health and that of their family members, functional state and illness symptoms. Evaluated need is done through professional assessments and objective measurements of patients' health status and need for medical care (Andersen, 1968; Babitsch et al., 2012).

Initial analysis and revisions. To test his original theory, Andersen used data from a nationwide survey conducted in 1964 by the Health Information Foundation and the National Opinion Research Center (Andersen, 1968). In this study, families were interviewed about their personal family health experiences from the previous year. His study showed that all three components of his model explained a significant portion of the variance among family use of health services. Predisposing characteristics explained 14%, enabling resources explained 6% and need explained 22% of the variance in whether health care services were used (Andersen, 1968). Despite showing initial predictive accuracy, the model received some criticism primarily due to its limited definitions of each of the categories of factors. For example, it did not account for the role of health care systems and resources. Therefore, over time, the model has undergone extensive review and revision (Andersen, 1995).

There have been four major developmental phases to Andersen's Behavioral Model. The first phase was the original Behavioral Model of Families' Use of Health Services, as described above. The second phase came in the 1970s, developed by Andersen, Aday and colleagues, and

added two major elements to the model. First, it addressed the role that health care systems play in influencing health care utilization, adding the enabling factors of health care policy, resources and the organization of the health care system. It also added measures to determine patient satisfaction with utilized services, including convenience, availability, financing, provider characteristics, quality of service and coordinated services received as these are potential barriers to future service utilization (Andersen & Aday, 1978).

The third phase of development of the Behavioral Model occurred in the 1990s. The major revision at this time was the inclusion of perceived and evaluated health status of the patient or family member (need factors) as variables in the model (Andersen, 1995). Perceived health status is how the head of household views a family member's health status, while evaluated health status is the physician's objective determination of the health status of the patient or family member (Andersen, 1995). This phase incorporated into the model the effect of the external environment, such as social status and availability of resources, as predisposing and enabling factors on a family's health. It also added behavioral measures of personal health practices such as self-care, diet, and exercise and their effects on health outcomes. These new features are important as they are shown to affect the evaluated health status of the patient (Andersen, 1995).

Lu Ann Aday's framework was integrated into the fourth and latest phase of changes to the Andersen model. Aday's framework was another model developed around the same time as Andersen's 1995 version of the Behavioral Model that looked at health services utilization from a social justice lens (Aday, 1994). Aday's framework incorporates the role of economic distribution, psychological and social resources, and social status on health behaviors of vulnerable populations through the lens of social stratification and social inequality theories.

This framework also addresses the relationship between the community and the individual regarding health (Aday, 1994). This is important because it takes sole responsibility of health behaviors away from the individual's decision-making, adding social responsibility for health, inclusive of social structure, systems and resource distribution. According to Aday's theory, community resources directly impact individual resources such that if a community does not invest in a particular group, then the individual has fewer resources to access in regards to improving or maintaining good health and preventing illness (Aday, 1994).

Gelberg-Andersen Behavioral Model for Vulnerable Populations. The most recent and fourth phase of revisions to the Behavioral Model was conducted by Gelberg, Andersen and Leake (2000). They maintained all the components of the third model (Andersen, 1995) and incorporated the framework for understanding and addressing the specific needs of vulnerable populations developed by Aday (Gelberg et al., 2000). In this model, Gelberg, Andersen, and Leake (2000) categorized those predisposing, enabling and need factors used when studying any population as "traditional domains". They also specified additional factors, called "vulnerability domains", for predisposing characteristics, enabling resources, need, and health behaviors when studying vulnerable populations. Vulnerable populations included, "minorities; undocumented immigrants; children and adolescents; mentally ill, chronically ill and disabled persons; the elderly; and impoverished and homeless persons and any other populations who are at significantly higher risk for disease and injury" (Gelberg et al., 2000, p. 1274). The underlying assumption of this model was that "the factors that make homeless and other populations vulnerable might also affect their use of health services and their health status" (Gelberg et al., 2000, p. 1276).

In applying the Gelberg-Andersen model to this study, children are considered a vulnerable population, and children who have experienced adversity are a specific subset of that vulnerable population. Children with ACEs have vulnerability factors that could make them at higher risk both for needing and for not receiving care. Children with ACEs are particularly vulnerable because they have experienced significant events in their lives that have negative physical and emotional impacts throughout the lifespan that require intervention. They may also be at risk for not receiving those services because family-related factors may impede their access.

Systems of Care

However, systems factors may act as facilitators to get these children into services through avenues other than family. Children with ACEs have a greater likelihood of experiencing more emotional and behavioral problems that bring them to the attention of professionals within larger systems. Therefore, a second framework, the Systems of Care approach is used to help reconcile these competing mechanisms and to identify relevant systems that influence mental health utilization for children with ACEs. Those systems that influence mental health services utilization for children can, then, be integrated as enabling factors within the Gelberg-Andersen Behavioral Model for Vulnerable Populations.

Over the past three decades the Systems of Care approach has been at the forefront of policy decisions related to children's mental health care. Broadly, Systems of Care are coordinated networks of community-based services and supports whose purpose is to assist and improve the functioning of youth with mental health needs and their families (Miller, Blau, Christopher, & Jordan, 2012). Systems of Care is grounded in an ideology of understanding and helping children and their families within the context of their own unique lives. It focuses on

team-based work, builds on the strengths of the individual child and family, and uses the child and family as partners in service decisions and delivery and in building services that will improve functioning. In addition to the child and family, team members may include social workers, psychologists, psychiatrists, other mental health professionals, medical professionals, criminal justice professionals and school staff (Brashears, Davis, & Katz-Leavy, 2012; Miller et al., 2012). The relevant systems embedded in this approach include mental health, school, medical, child welfare and juvenile justice systems.

The Great Smoky Mountains Study of Youth. There are numerous studies examining the influence of Systems of Care on mental health services utilization in youth. One significant study, which began in 1993, was the Great Smoky Mountains Study of Youth (GSMS). This was a population-based, longitudinal survey of 1,015 children aged nine, eleven and thirteen years enrolled in the public-school system in one of eleven predominantly rural counties in western North Carolina. Youth were assessed annually until age 16 years. The purpose of this study was to examine the development of psychiatric disorders among youth and their need for and use of mental health services (Burns et al., 1995; Copeland, Brotman, & Costello, 2015). In the sample, the overall rate of having a mental health diagnosis was 20.3%; 21.0% of these youth received some type of mental health service during the first year of the study. Even among the children with the highest need (e.g., those with a serious emotional disorder), only 40% had received any kind of mental health care during the three months preceding the first interview (Burns et al., 1995; Farmer et al., 1999).

In regards to Systems of Care, the school system, in particular, played a strong role in providing access to children in receiving mental health services, with medical professionals also having a smaller, but significant role (Burns et al., 1995; Farmer et al., 2003). More than half of

youth who received mental health services at some time during their lives entered the service system by first receiving services in the school system. Another quarter of youth entered through the specialty mental health system and about 13% by first receiving services through the medical system. These studies strengthen the argument that children are likely to be identified for and receive services through a systems approach, and school, mental health and medical systems are key players in ensuring that youth who need services receive them (Farmer et al., 2003).

The National Survey of Child and Adolescent Well-being. Another longitudinal, nationally representative survey that has provided insight into children's mental health needs and utilization in relation to Systems of Care is the National Survey of Child and Adolescent Well-being (NSCAW). There have been two cohorts of this study; the first included over 6,200 children aged birth to 14 years who were followed for five to six years and the second cohort included more than 5,800 children aged birth to 17.5 years who were followed for three years (NSCAW-II). All children in this study had been alleged victims of maltreatment during the sampling period, whether or not their case was substantiated. Through child, caretaker, caseworker and teacher interviews, information was gathered regarding the child's functioning, risk and protective factors, service needs and receipt of services (U.S. Department of Health and Human Services & U.S. Administration for Children and Families, 2003).

For this population, nearly half of children between two- and fourteen-years-old had a clinically significant emotional or behavioral problem (Burns et al., 2004). While youth with higher mental health needs (e.g., a CBCL score in the clinical range versus those with lower scores) were more likely to receive services, only one fourth received any specialty mental health care during the previous 12 months. Children showed an increase in mental health services utilization as they grew older and came into contact with the school system. Having a parent that

was reported to child welfare also increased the likelihood of the child receiving mental health services (Horwitz et al., 2012).

Not only does the school system refer children to mental health services, but it is also a de facto provider of services to children. Burns and colleagues (1995) found that between 70 and 80% of youth who received services for a mental health problem did so within the school system. This may be because a youth's behaviors come to the attention of school personnel who then seek services for the child. The school system is by far the most common point of entry as well as provider of services for children with mental and behavioral health problems (Farmer et al., 2003, 1999). Other literature lends further support to these findings (Pumariega & Vance, 1999; Ringerseisen, Henderson, & Hoagwood, 2003).

Summary

The Gelberg-Andersen Behavioral Model of Vulnerable Populations is a highly utilized model for understanding the health behaviors of disenfranchised groups. It provides a conceptual framework to understanding the multiple factors that influence whether or not a person accesses services. These factors are divided into traditional and vulnerability domains and predisposing, enabling and need factors. The Gelberg-Andersen Behavioral Model of Vulnerable Populations is a useful tool to study mental health services utilization for children who have experienced adversity and how these factors work together to influence health behaviors. Children who have experienced adversity are a vulnerable population as experiencing ACEs increases the likelihood for experiencing emotional and behavioral problems, experiencing more severe and comorbid mental problems, and may also influence whether or not needed mental health services are utilized. Additionally, the Systems of Care approach is important in understanding service utilization in this population and can be integrated into the Gelberg-

Andersen model. Systems act as enabling factors to receiving needed mental health services, particularly child welfare and the educational system, with some influence of the medical system as well. Examining these systems factors as enablers in service utilization in conjunction with family and child predisposing and vulnerability factors related to adversity will afford a comprehensive approach to understanding mental health services utilization for children who have experienced adversity.

CHAPTER 2

Review of the Literature

This chapter presents an overview of the current literature that provides for an understanding of the important concepts that are used in this study. The chapter begins with an overview of adverse childhood experiences, including the background of the original ACE study, the evolution of how ACEs are defined, their association with individuals, and the demographics of children who have experienced adversity. This chapter also reviews the different methods that have been used to study adversity to provide an understanding of the methods used in this current study. Next, using the Gelberg-Andersen Behavioral Model for Vulnerable Populations as an organizing tool, studies that examine the relationships of traditional and vulnerability predisposing, enabling and need factors on mental health services utilization for youth are described, including how child, family and systems factors influence mental health service utilization. Finally, this chapter describes the aims and hypotheses of this current study which are derived from the reviewed literature.

Adverse Childhood Experiences Overview

Adverse childhood experiences are stressful or traumatic childhood experiences that are a common pathway to social, emotional and cognitive impairment and lead to increased risk of unhealthy behaviors, violence or revictimization, disease, disability and premature mortality (Anda, Butchart, Felitti, & Brown, 2010). Studies regarding ACEs began in the 1990s, after the initial work of McGinnis and Foege (1993) entitled, *The actual causes of death in the U.S.* This population study identified risk behaviors including tobacco, diet and activity patterns, alcohol, drug use, and sexual behavior as the most prominent contributors to mortality in the United States. Along with microbial and toxic agents, firearms and motor vehicles, these factors

accounted for approximately half of all deaths in the U.S. in 1990. This study showed that high risk behaviors were associated with mortality; the question of what leads people to engage in these high-risk behaviors, however, remained. Studies then focused on the association of certain events in childhood related to abuse and family dysfunction and later high-risk behaviors and medical consequences in adulthood (Felitti, 1991, 1993; Gould et al., 1994). In 1998, Felitti and Anda continued this important work in their seminal study of ACEs and long-term health risk behaviors and health consequences, which was the first major comprehensive study of childhood stressors under the ACEs framework.

The Original ACEs Study

This study was a collaboration between Kaiser Permanente and the Centers for Disease Control and took place at Kaiser Permanente's San Diego Health Appraisal Clinic. Its purpose was to describe the long-term relationships of many types of adversity in childhood to disease risk factors and incidence, quality of life, health care utilization and mortality (Felitti et al., 1998). For this study, an ACEs questionnaire was mailed to all Kaiser Health Plan members who completed standardized medical evaluations at the clinic between August and November 1995 and between January and March 1996. Risk factors that contribute to the leading causes of morbidity and mortality in the U.S., specific disease conditions that are the leading causes of mortality, and self-rated perception of overall health also were assessed (Felitti et al., 1998). Of the 13,494 adults surveyed, 71% (9,508) responded.

The ACEs questionnaire consisted of seven categories of childhood adversity divided into two major types: abuse and household dysfunction (Felitti et al., 1998). There were three categories of childhood abuse: psychological abuse; physical abuse and contact sexual abuse. There were four categories of household dysfunction: exposure to substance abuse, mental

illness, violent treatment of mother or stepmother, and criminal behavior. Respondents exposed to a type of adversity answered 'yes' to one or more of the sub-categories. The overall measure of childhood exposure, or the ACE score, was a sum of the 'yes' categories; thus, the possible range of number of exposures was from zero to seven (Felitti et al., 1998). This questionnaire remains the foundation for all subsequent ACE studies, although additional categories of adversity have been used by other studies. Also, using the count measure as an ACE score in research and in practice remains commonplace.

More than half of respondents reported experiencing at least one ACE, one quarter at least two, and 6.2% reported experiencing at least four categories of adversity in childhood (Felitti et al., 1998). The results strongly indicated a relationship between childhood adversity and disease risk factors, disease incidence, and health perception. There was a dose-response relationship between the number of categories experienced and each of the adult health risks studied. For respondents who experienced four or more categories, there was a much higher increase in health risk factors (i.e., alcoholism; drug abuse; depression and suicide attempt; smoking; poor self-rated health; having 50 or more sexual partners; having a sexually transmitted disease; and physical inactivity and severe obesity). The results were similar with the diseases (i.e., heart disease, cancer, emphysema, and liver disease) that are among the leading causes of mortality in the U.S. (Felitti et al., 1998).

The seven ACE categories were strongly interrelated with one another and persons with multiple categories were likely to have multiple health risk factors later in life. For persons reporting any single category of exposure, the probability of exposure to any additional category ranged from 65-93%; and probability of at least two additional exposures ranged from 40-74%. There was a strong relationship between a respondent's ACE score and the number of risk

factors reported, including alcohol and drug abuse, depression and suicide attempts, among others listed above. Fifty-six percent of those with no ACEs had no risk factors, whereas this was only 14% of persons with four or more ACEs; only 1% of persons with no ACEs had four or more risk behaviors versus 7% of those with four or more ACEs. The findings suggest that the impact of these ACEs on adult health status is strong and cumulative (Felitti et al., 1998).

While the original study findings were groundbreaking, there were limitations to the study design. The Kaiser Permanente sample included insured, primarily White, educated and middle-aged participants. Since that time, additional studies of ACEs have replicated and expanded the findings of the original ACEs study, and new information about ACEs and their effects have emerged. This has led to a number of changes to how ACEs are studied, including an expansion of the types of experiences categorized as ACEs, the racial/ethnic, socioeconomic and other diversity in the populations studied, and the examination of ACEs in younger samples and the relationship to childhood and adolescent outcomes including longitudinal and prospective studies.

Expanded ACEs Categories

New studies of ACEs have expanded the definition of childhood adversity to include other stressful and traumatic childhood events that have similar outcomes for health and mental health to the previous ACEs findings. In 2009, additions to the ACEs survey included: witnessing criminal and collective violence in the community, exposure to bullying, and other forms of peer violence (Anda et al., 2010). Finkelhor and colleagues (2013) also proposed the inclusion of peer rejection, exposure to violence outside the family and low socioeconomic status, and conducted a national survey of youth ages 10-17 years using their expanded definition of ACEs. They found that all ACE categories, including the expanded ACEs, were associated

with distress. Distress was measured using a shortened version of the anger, depression, anxiety, dissociation, and posttraumatic stress scales of the Trauma Symptoms Checklist for Children (TSCC) (Briere, 1996). There was a clear dose-response relationship between ACEs and distress, and several of the expanded ACEs showed a strong association. These were peer victimization, property victimization, parents always arguing, having no good friends, having someone close with a bad illness or who had a bad accident, low socioeconomic status and exposure to community violence (Finkelhor et al., 2013).

Developmental researchers also show that these additional childhood experiences are important in predicting long-term health and well-being outcomes in adults (Finkelhor et al., 2013; Finn & Owings, 2006). The evidence for the ACE additions is based on findings from several studies that each focused on community violence, peer rejection or socioeconomic status. Data from the National Youth Survey Family Study showed a relationship between witnessing community violence in childhood and later negative behavioral outcomes as adults (Franzese, Menard, Weiss, & Covey, 2017). In a longitudinal study on adult outcomes related to preadolescent peer rejection, lower levels of peer rejection predicted overall life adjustment; peer rejection and the absence of friendships in childhood were each associated with psychopathological symptoms in adulthood (Bagwell, Newcomb, & Bukowski, 1998). Finally, low socioeconomic status, in a longitudinal study of 1,037 children who were followed from birth to 32 years, was associated with an increased risk of major depression, anxiety disorder, and alcohol and substance dependence in adulthood (Melchior, Moffitt, Milne, Poulton, & Caspi, 2007).

Cronholm and colleagues (2015) made a case to expand ACEs even further to include experiencing racism, living in an unsafe neighborhood, experiencing bullying and having a

history with foster care. In their sample of 1,784 respondents from a large, representative, community-based health survey in an urban area, half experienced one or two expanded ACEs and 13.4% experienced three or more. Just over half of participants experienced both traditional and expanded ACEs, but 13.9% of those who had adversity only experienced the expanded ACEs. Therefore, given how frequently participants experienced these additional ACEs, they were recommended in order to obtain a better understanding of the effects of adversity in childhood for a broader population.

A literature review conducted by Pachter and Coll (2009) lends support to racism or racial discrimination as a contributor to child health outcomes. Of the forty articles reviewed, twenty-six studied behavioral and mental health outcomes and all but one showed an association between racism and behavioral/mental health issues, including depressive symptoms, low self-esteem/self-worth, and anxiety in preadolescents and adolescents. All reviewed studies of internalizing and externalizing behaviors, conduct problems, anger and delinquent behaviors showed an association with experiencing racism or racial discrimination (Pachter & Coll, 2009). Other studies also support the expanded ACEs. Wade, Shea, Rubin and Wood (2014) conducted focus groups with 105 young adults who grew up in a low-income urban area. These respondents endorsed community stressors (neighborhood crime, violence, death) as highly common stressors, with personal victimization also being highly stressful in youth. Further, in a longitudinal study of 281 boys living in disadvantaged neighborhoods, the level of neighborhood disadvantage (based on median family income and percentages of families below poverty, households on public assistance, residents unemployed, single-mother households and residents with education less than a bachelor degree) was positively associated with overt behavior

problems as measured by the Child Behavior Checklist, beginning at six years of age (Winslow & Shaw, 2007).

Together, these studies lend support that, while conventional ACEs are strong predictors of long-term health consequences, other adversities of childhood also have negative effects across the lifespan, especially for diverse populations. Specifically, these studies confirm previous findings that witnessing or experiencing community violence, experiencing racism or racial discrimination, peer victimization, and low socioeconomic status in childhood are associated with negative health effects and increased participation in risk behaviors both for children and later for adults. These studies also confirm the importance of the traditional ACE items (Kohen, Dahinten, & McIntosh, 2008; Pachter & Coll, 2009; Reid et al., 2009; Wilson, Pettineo, Emerson, & Donenberg, 2015; Wright, Fagan, & Pinchevsky, 2013).

Variations in How ACEs Are Studied

In addition to expanding ACE categories over the past two decades, different approaches have been used to study ACEs. Whether examining the effects of individual ACE items or combining them into a single variable or several variables, each approach comes with its strengths and limitations. When studied individually, ACEs like child abuse and domestic violence consistently relate to aspects of child well-being (Bright et al., 2016; Finkelhor et al., 2013; Flouri & Kallis, 2011). Most studies related to the long-term effects of ACEs use a cumulative approach, similar to the original ACEs study in 1998, primarily due to the co-occurring nature of ACEs. As discussed in previous sections, exposure to one ACE category significantly increases the likelihood that a child is exposed to additional types of adversity (Costello, Erkanli, Fairbank, & Angold, 2002; Dong et al., 2004; Finkelhor, Ormrod, & Turner, 2007; Turner, Finkelhor, Hamby, & Shattuck, 2013). However, the cumulative approach does

not consider the type, chronicity or severity of the adverse experience. A third, more recent approach, seeks to address this by combining certain ACEs categories based on theory and/or data analysis. This is helpful because it can allow for identifying groups of individuals with similar characteristics of ACE exposure and can then be used to examine how different subgroups of ACEs work in the development of problems and mental health services initiation.

Studies on Individual ACEs. Many studies examine specific ACE categories and their individual contributions to mental health. Chartier, Walker, and Naimark (2010) used the Kaiser-Permanente ACE study data and examined associations between each of the original ACEs and behavioral health problems in adults. They found that, with the exception of physical neglect, each of the ACEs was associated with drug use during adulthood. All of the ACEs were positively associated with lifetime suicide attempts, with exposure to childhood emotional abuse showing the largest association (5.59 increased odds). Each ACE, except for having an incarcerated household member, was significantly associated with depression in adulthood, with exposure to parental mental illness, emotional abuse and then emotional neglect having the highest odds. Overall, childhood physical and sexual abuse had stronger associations with behavioral health outcomes than parental marital conflict, poor parent-child relationship, low parental education and parental psychopathology.

Studies in children and youth have also examined individual ACEs. A study by Lucenko, Sharkova, Huber, Jemelka, and Mancuso (2015) aimed to measure the relative contribution of each adverse experience to adolescent behavioral health problems using administrative data from the Washington State Department of Social and Health Services (DSHS) integrated client database. This study examined data from 125,123 youth aged 12-to-17 years who were clients of DSHS. They found that parental death, parental mental illness, child abuse or neglect, and

homelessness were each significantly associated with adolescent behavioral health problems. Individual ACEs are also correlated with specific problems that a child experiences. For example, children who have witnessed family violence, other major violence, or who have been abused are more likely to have higher levels of depression, anger and aggression than children who have not been victimized (Turner, Finkelhor, & Ormrod, 2006). Adolescents who have a divorced or separated mother, who live in poverty or whose mother had a partner with a criminal history were more likely to have an anxiety disorder than adolescents without those experiences (Phillips, Hammen, Brennan, Najman, & Bor, 2005). And having at least one substance abusing parent has been consistently associated with conduct problems and depression in children (Hanson et al., 2006; Merikangas, Dierker, & Szatmari, 1998).

Studies on Cumulative ACEs. Many studies focus on health and mental health outcomes in relation to a person's ACE score, and as these findings were described in more detail earlier, they will not be repeated here. Briefly, this method was used in the original ACEs study and has maintained its utility in research due to replicated results that show higher ACE scores yield higher risk of poor outcomes in adults and children. For example, youth with higher cumulative ACE scores have a higher risk of interpersonal and self-directed violence (Duke et al., 2010), behavioral problems (Appleyard et al., 2005) and substance abuse and depression (Flouri & Kallis, 2011) and show decreased emotional well-being (Balistreri, 2015) as previously described.

Studying ACEs in Clusters. Three frameworks, to date, have been utilized to combine individual ACEs into a smaller number of similar subsets using theoretical and statistical approaches: clustering by victimization and non-victimization adversity; clustering by threat and deprivation; and using latent class analysis (LCA) to determine underlying subgroups of ACEs.

Turner, Finkelhor, and Ormrod (2006) separated victimization and non-victimization adversity when studying the impact of adversity on children and adolescents in a study of a U.S. nationally representative sample of 2,030 children aged two to 17 years. They divided ACEs into these two categories to generate a more accurate picture of the effects of victimization, asserting that victimization and non-victimization stressors often co-occur, and the effects of victimization exposures can be overestimated when non-victimization exposures are not considered.

Turner and colleagues (2006) studied four types of victimization (child maltreatment, sexual victimization, witnessing family violence and other major violence) and several non-victimization stressors (serious illness, accidents, parent imprisonment, natural disaster, substance abuse by family members, parental arguing, chronic teasing about physical appearance, homelessness, school failure, parental unemployment, out of home placement, parental incarceration, death of someone close). Results indicated that each form of victimization made a unique contribution to increased risk for mental health problems and cumulative exposure to non-victimization adversity had an independent effect on depression and anger, but not aggression. The magnitude of the associations for the cumulative non-victimization score, when combined with victimization adversity, matched or exceeded the independent effects of the victimization items (Turner et al., 2006). This showed that while each victimization adversity had a unique effect on child mental health, the additive effects of victimization and non-victimization stressors on children's mental health were stronger.

McLaughlin, Sheridan, and Lambert (2014) proposed an alternative framework for differentiating between dimensions of adverse childhood experiences and their disparate impacts on neural development in children using a threat and deprivation model. While they used a cumulative approach to study ACEs, they discriminated experiences by creating two separate

cumulative scores: one for threat and one for deprivation. Threat was defined as experiences that “involve the presence of an atypical (i.e., unexpected) experience characterized by actual or threatened death, injury, sexual violation, or other harm to one’s physical integrity” (Sheridan & McLaughlin, 2014, p. 580). Deprivation was defined as experiences that “involve the absence of expected environmental inputs in cognitive (e.g., language) and social domains as well as the absence of species- and age-typical complexity in environmental stimulation” (Sheridan & McLaughlin, 2014, p. 580). Examples of ACEs on the deprivation dimension include physical neglect, emotional neglect, and poverty. This framework is important as it recognizes issues of neglect as stressful events in a child’s life that have lasting effects into adulthood and assists in understanding the different pathways to poor outcomes for children and adults.

There is evidence that these dimensions are separable and result in unique cognitive, emotional and neurodevelopmental pathways that lead to different developmental outcomes. Threatening experiences during childhood, for example, are associated with changes in emotion perception, attention and memory, emotional learning, emotional reactivity and emotion regulation (McLaughlin & Sheridan, 2016). Threat exposure are associated with delayed attentional disengagement from anger (Pollak & Tolley-Schell, 2003), magnified emotional reactions to negative cues (McLaughlin et al., 2014), and difficulty modulating responses to negative emotional stimuli (Heleniak, Jenness, Vander Stoep, McCauley, & McLaughlin, 2016; Herringa et al., 2013; Kim & Cicchetti, 2010). In research that also studied deprivation in relation to these emotional processes, none were associated with deprivation after adjustment for threat (Busso, McLaughlin, & Sheridan, 2017; Lambert, King, Monahan, & Laughlin, 2017). Therefore, threat was a stronger risk factor than deprivation for negative behavioral outcomes.

Deprivation, on the other hand, influences mechanisms that are at least partially distinct from experiences of threat. Deprivation is associated with deficits in numerous forms of learning and memory (Rosenzweig & Bennett, 1996), and deficits in higher order cognitive functions such as executive functioning (Sheridan, Peverill, Finn, & McLaughlin, 2017). This leads to later risk for externalizing psychopathology (McLaughlin et al., 2014). In a study of 168 adolescents, Sheridan and colleagues (2017) found that deprivation (low parental education and child neglect) was associated with greater parent-reported problems of executive functioning after adjustment for threat, and low parental education was also associated with poor working memory performance, after adjusting for physical and sexual abuse. Yet exposure to environmental threats involving physical and sexual abuse and direct experiences of interpersonal violence in the community were not associated with any measure of executive functioning after adjusting for co-occurring deprivation.

Recently, studies have assessed different underlying patterns of ACEs and their association with outcomes in children and young adults. Latent class analysis (LCA) is a statistical approach used to identify the underlying patterns of ACEs that co-occur most frequently and to place individuals into classes based on their patterns of adversity exposure. There are studies that support the utility of using LCA to identify ACEs classes, including those that use child welfare, school-based intervention, juvenile detention, community-based, and national samples. For example, Brown, Rienks, McCrae, and Watamura (2019) used LCA to examine the co-occurrence of adverse events experienced by children whose families were investigated by child protective services using NSCAW-II data. Several latent classes emerged; children tended to cluster across three general groupings of ACEs. The first grouping consisted of co-occurring physical neglect, emotional abuse and witnessing domestic violence towards the

caretaker. The second grouping clustered around family violence and broad household dysfunction (e.g., caretakers who were treated violently; caretaker substance abuse; caretaker divorce; and caretaker mental illness). Finally, and third, caretaker divorce and emotional abuse tended to cluster together.

Ballard and colleagues (2019) conducted a study that examined the relationship of latent classes of adversity to behavioral health outcomes in adolescence and young adulthood. In this 26-year longitudinal study of 1,815 participants in a randomized field trial of two school-based preventive intervention programs, they found both support for distinct classes of trauma experiences in childhood and the predictive value of these classes to specific psychiatric and behavioral outcomes. Specifically, three latent classes of childhood experiences were supported: (1) high endorsement of experiencing sexual abuse as well as having close friends or family who have experienced sexual assault and high parental psychopathology; (2) high endorsement of violence exposure which includes high rates of experiencing physical assault and physical injury as well as witnessing physical assault, physical injury or death; and (3) low ACEs. The sexual assault and violence exposure classes were predictive of specific behavioral and psychiatric outcomes when compare to the low ACEs class. The high sexual assault class reported significantly higher rates of suicide ideation and attempt, post-traumatic stress disorder, and major depression, while the high violence exposure class reported higher levels of antisocial personality disorder, post-traumatic stress and substance use disorders.

In another study using LCA to classify ACEs, Ford, Grasso, Hawke, and Chapman (2013) identified three classes of ACE exposure in 1,959 youths in juvenile-detention using 19 ACE categories. These classes were (1) low adversity; (2) relative moderate adversity; and (3) poly-victimization. The youth in the poly-victimization class were more likely to report severe

emotional and behavioral problems than those in the low and moderate classes. Also, in a study of a community sample of 336 young adults (18 to 25 years old), four distinct classes were found out of the 13 types of ACEs that were examined (Shin, McDonald, & Conley, 2018). These classes were (1) low ACEs; (2) household dysfunction/community violence (high probabilities of endorsing exposure to alcohol abuse, mental illness and property crime); (3) emotional ACEs (moderate to high probabilities of emotional abuse and emotional neglect, with low probabilities of household drug and alcohol abuse and parent/caretaker incarceration); and (4) high/multiple ACEs. This study found that those in the emotional ACEs and the high/multiple ACEs classes had less impulsive self-control when compared to those in the low ACEs class (Shin et al., 2018).

Additionally, a LCA study was conducted using the 2011/12 National Survey of Children's Health data. Lanier, Maguire-Jack, Lombardi, Frey, and Rose (2017) compared cumulative risk and latent class approaches for ACEs and child health outcomes using a U.S. nationally representative sample of 95,677 children aged 0-17 years. The researchers identified seven classes; further, they showed that these combinations of ACEs differentially predicted child health outcomes. These classes were (1) 0-1 ACE; (2) 1-2 ACEs; (3) family domestic violence, no parent/caretaker mental illness; (4) parent/caretaker mental illness and poverty; (5) parent/caretaker substance use and incarceration; (6) parent/caretaker substance use, no incarceration; and (7) high ACEs. The youth exposed to parental mental illness and poverty were at higher risk for special health care needs (i.e., having physical, mental and/or cognitive impairments) than all other groups, including children exposed to three or more ACEs as identified by the cumulative risk approach. This is noteworthy as, typically, experiencing three or more cumulative ACEs results in greater likelihood of negative outcomes when compared to

experiencing one or two ACEs; however, this particular combination of two adversity categories showed greater likelihood of negative outcomes (Lanier et al., 2017).

While these findings did not assess utilization, using LCA could provide an improved understanding of how ACEs group together to predict different child mental health outcomes and service utilization. Each of the studies had a low ACE class except when the sample included children from families who were investigated by child welfare. Otherwise, the classes (how the different ACE items grouped together) were diverse across the studies. This may be due to the various ACEs items, populations and sample sizes studied.

Demographics of Children who Experience Adversity

Other studies focus on the characteristics of children who experience ACEs and show that children who face adversities are different from children who have not in key areas. These differences may represent other ways that children who have experienced adversity are vulnerable. This is because those children who experience ACEs are overrepresented in other vulnerable populations (racial/ethnic minority and low socioeconomic groups; according to Gelberg et al., 2000) that show decreased mental health services utilization (Burnett-Zeigler & Lyons, 2010; Burns et al., 1995; Headman & Cornille, 2008; Mayberry & Heflinger, 2011). The relationships of these demographic characteristics with ACEs are reviewed here, and then, in the next section, are the relationships of these demographics with mental health services utilization.

Among child demographic characteristics, males are more likely to experience at least one ACE and more likely to experience more ACEs in their childhood than females (Marryat & Frank, 2019). Children who are Black or African American and those who are Hispanic are more likely to experience at least one ACE than children who are White; and both groups are

also more likely to experience four or more ACEs than their White counterparts (Metzler, Merrick, Klevens, Ports, & Ford, 2017; Nurius, Green, Logan-Greene, Longhi, & Song, 2016).

There are also differences on family demographics. Children whose parent or caretaker has less than a high school degree are more likely to experience at least one ACE compared to children whose parent or caretaker graduated high school (Metzler et al., 2017). Those whose parent or caretaker completed college are almost twice as likely to have never experienced an ACE. Conversely, children whose parent or caretaker did not complete high school are more than twice as likely to have experienced four or more ACEs (Metzler et al., 2017). Poverty status is another family characteristic studied. Children who live below the federal poverty level are three times more likely to have two or more ACEs and five times more likely to experience four or more ACEs than those who live in families whose income is at least 400% of the federal poverty level (Halfon, Larson, Son, Lu, & Bethell, 2017).

The Gelberg-Andersen Behavioral Model of Vulnerable Populations

Predicting mental health service utilization for children, and especially those who have experienced ACEs, is complex given the multitude of variables that affect the likelihood of service utilization. Child and family traditional predisposing demographic characteristics, traditional enabling variables related to the family and medical system and need variables can predict service utilization within the general population. Additionally, vulnerability characteristics that could relate to service utilization in children who have experienced adversity are also present. These include vulnerability predisposing and enabling factors related to family functioning and the ACEs themselves. Child welfare and school system variables are also particularly important when studying this group. Children who have experienced adversity are more likely to be involved in the child welfare system. The school system is also important as,

given their increased needs, children with ACEs may be more likely to have problems in school that bring them to the attention of school administrators. The Gelberg-Andersen Behavioral Model of Vulnerable Populations is a useful framework for reviewing the research findings that support the child, family and systems factors that predict mental health services utilization for children who have experienced adversity, which are described below.

Traditional Domain

Traditional Predisposing Factors. Child demographic factors such as a child's age, race and ethnicity, and sex are predisposing factors in Gelberg-Andersen's model. These characteristics are associated with mental health service utilization in children. Being younger or of racial/ethnic minority status are each associated with a lower likelihood that mental health services will be initiated, and if initiated, there is a higher likelihood of premature dropout from services (Headman & Cornille, 2008; Kazdin, Holland, & Crowley, 1997; Mayberry & Heflinger, 2011). In reviewing literature on children who have been referred to child welfare for child maltreatment, one study of 5,872 youth ages 0-17.5 years found that being Black or Hispanic decreased a child's likelihood of receiving needed mental health services (Horwitz et al., 2012). This was further supported in a study that used the second iteration of the National Survey of Child and Adolescent Well-being (NSCAW-II) data and showed racial/ethnic minority youth involved in child welfare services had less use of mental health services compared to their White peers (Farmer et al., 2010). In a different study using the NSCAW-II data, younger children (e.g., two to five years old) were less likely to receive needed mental health services (Horwitz et al., 2012), as were 8- to 11-year-olds compared to 12- to 15-year-olds in a separate nationally representative sample of non-institutionalized adolescents (Ringeisen et al., 2012).

Other results regarding race and age are reported for different studied populations that include children with special health care needs (CSHCN) (Ganz & Tendulkar, 2006; Horwitz et al., 2012; Warfield & Gulley, 2006). CSHCN is defined by the Maternal and Child Health Bureau as children “who have or are at increased risk for a chronic physical, developmental, behavioral or emotional condition and who also require health and related services of a type or amount beyond that required generally” (McPherson et al., 1998, p. 138). Studies using National Survey of Children with Special Health Care Needs (NS-CSHCN) data has shown that for these children, as they get older, and for Black children in comparison to White children, there is increased unmet need for mental health (Ganz & Tendulkar, 2006; Warfield & Gulley, 2006). For example, Ganz and Tendulkar (2006) reported 13- to 18-year-olds experienced almost twice the unmet need compared to 1- to 4-year-olds and approximately one-quarter more than 5- to 12-year-olds. Additionally, Black children were approximately one-third more likely to report unmet need compared to their White peers. Unmet need is defined as reporting a need for mental health services in the past year and not receiving all needed services (U.S. Department of Health and Human Services, Health Resources and Services Administration, & Bureau, 2013). Unmet need does not necessarily mean the child is not receiving services. Thus, it could be that while older children are more likely to receive services, they are not receiving enough or the type of services to meet their needs. Because children who have experienced adversity are at much higher risk to be considered a child with a special healthcare need, studies using this population can be helpful in considering variables associated with mental health service utilization and the need for those who have experienced ACEs.

Findings related to a child’s sex and mental health services utilization have also been reported, including from the Great Smoky Mountains Study that indicated more service use by

males than females (Burns et al., 1995; Farmer et al., 1999). Kataoka, Zhang, and Wells (2002) conducted a secondary data analysis using three national datasets, which all showed more service use by males than females. However, other studies also show males as having more unmet need. For example, Ganz and Tendulkar (2006) used NS-CSHCN data and found males had increased unmet need compared to females. These studies used different samples (e.g., 1,105 9-13-year-old children in western North Carolina versus a population study of children with special health care needs), which may account for some differences. However, similar to age, it may be that while males are more likely to be in services, they are also more likely to need a level of services beyond what they receive, leading to more unmet need. Males have been shown to have an increased need for mental health treatment (Burns et al., 1995).

Family-level characteristics such as the education level of the parent/caretaker and family structure are also predisposing traditional variables in the Gelberg-Andersen Model that influence mental health service utilization. Children who have a parent or caretaker with lower educational attainment are less likely than their peers whose parent/caretaker completed a higher level of education to utilize and also to complete needed mental health services (Burnett-Zeigler & Lyons, 2010; Farmer et al., 1999; Ganz & Tendulkar, 2006). Regarding family structure, children who live in other-than-two-parent-households experience an increased likelihood of accessing services (Burnett-Zeigler & Lyons, 2010; Gaskin, Kouzis, & Richard, 2008). In a study using a national sample of adolescents, there were higher rates of mental health treatment for adolescents whose parents were divorced than those who had parents who were married or cohabitating (Merikangas et al., 2011), but there was also increased unmet need compared to children in two-parent families (de Haan et al., 2013; Miller et al., 2013). This could, again, be attributed to a higher level of need and the inability of current service use to meet those needs.

Children in foster care are more likely to receive needed mental health services (Lyons & Rogers, 2004).

Traditional Enabling Factors. The second group of factors that are useful in the prediction of mental health service utilization according to the Gelberg-Andersen model are traditional enabling factors. Traditional enabling factors can be divided into family factors and systems factors. Research supports the use of enabling family factors such as income level to predict service utilization. Medical system factors are also traditional enabling factors that have utility in improving access for children in the general population to mental health and other medical services.

Family income level is associated with mental health services utilization in children. Low family socioeconomic status decreases the likelihood that services will be initiated or sustained (Gyamfi, 2004; Headman & Cornille, 2008). Family income is also inversely related to unmet mental health care needs, as children who live in families 100% below the federal poverty level (FPL) are three times more likely to report unmet need than those children who live in families with incomes greater than 185% of the FPL (Ganz & Tendulkar, 2006). Similarly, in a NS-CSHCN study from 2009-2010, unmet need was disproportionately weighted toward children in poverty. Compared to children in the highest income group (400+% FPL), CSHCN living in the poorest homes (below 100% FPL) were more likely to report an unmet need for mental health services (Ganz & Tendulkar, 2006; Rosen-Reynoso et al., 2016).

Medical-system enabling factors. A traditional system related to services utilization is the medical system. A study conducted using the GSMS data showed the medical system provides a small percentage (11-13%) of mental health treatment to children, although the medical system also acts as a referral source for services (Burns et al., 1995). Medical-system

factors enable the ease to which the family and child can access services based on factors such as insurance, having a usual source of care or a personal doctor or nurse, having adequate care coordination, and receiving needed referrals.

Having insurance and the type of insurance are seen as critical aspects of the medical system related to mental health services utilization; however, some results vary depending on the different type of insurance coverage. Studies consistently show that uninsured children are less likely to receive needed mental health services and report a higher unmet mental health treatment need (Busch & Horwitz, 2004; Farmer et al., 2010; Kataoka et al., 2002; Kreider et al., 2016). Ganz and Tendulkar (2006) found that among CSHCN, those who were uninsured were significantly more likely to report an unmet mental health care need compared to those with private insurance. And Busch and Horwitz (2004) found that uninsured children had dramatically reduced access to mental health services compared to insured children, and there was no significant difference in access between public and private insurance in their analysis using the National Survey of America's Families data, which included a nationally representative sample of non-institutionalized children ages 6-17-years-old ($n = 37,012$). Kataoka, Zhang, and Wells (2002), in their secondary data analysis that used three national datasets (The National Health Interview Survey, the National Survey of American Families and the Community Tracking Survey), found a higher percentage of youth with public insurance utilized needed mental health services compared to uninsured and privately insured children. They also reported fewer children with public or private insurance had an unmet need. Youth in foster care also have a much higher rate of receiving needed services than other children in need (8-15 times greater), which has been attributed to access to Medicaid reimbursable services and also having a caseworker and foster family working to ensure services are accessed (Halfon, Inkelas,

Duplessis, & Paul, 1999). Kreider and colleagues (2016), however, showed increased difficulty in accessing specialty services for CSHCN who had public versus private insurance. These differences may be due to the services covered by insurance and availability of services. For example, while public insurance typically covers services that are more comprehensive, the reimbursement rate to providers is lower and can make it difficult to find a service provider.

Another way to measure insurance is whether the parent or caretaker considers the child's health insurance to be adequate to meet the child's needs. Inadequate insurance is defined as no insurance, a gap in coverage, or coverage that does not pay for services such that it leads to an economic hardship (Child and Adolescent Health Measurement Initiative (CAHMI), 2018). Studies have shown that having inadequate insurance decreases the likelihood of mental health service utilization for a child (Morrissey-Kane & Prinz, 1999; Salloum, Johnco, Lewin, McBride, & Storch, 2016). In a study conducted by Salloum, Johnco, Lewin, McBride, and Storch (2016), they found that for their sample of children aged 7-13 years, 37% of parents identified inadequate insurance as a barrier to accessing needed services, either due to having no insurance or coverage that does not pay enough towards services. And for CSHCN, children who reportedly have adequate insurance as measured by no gap in coverage, reasonable amount of costs covered by insurance and the ability to see the needed providers, exhibit less unmet mental health need (Tang et al., 2008).

Other medical-system related factors affect a child's likelihood of receiving mental health services. Having a usual source of care, and by extension a personal doctor or nurse, adequate care coordination, and receipt of needed referrals each result in less unmet need for the child (Aysola, Bitton, Zaslavsky, & Ayanian, 2013; Baker-Ericzen, Jenkins, & Haine-Schlagel, 2013; Ganz & Tendulkar, 2006; Miller, Nugent, Gaboda, & Russell, 2013; Strickland, Jones,

Ghandour, Kogan, & Newacheck, 2011). When a family can identify a primary care provider that facilitates access to a range of health providers, racial and ethnic disparities in access to mental health services are significantly reduced (Beal, Doty, Hernandez, Shea, & Davis, 2007). It is presumed that building a personal relationship between physician and patient (and patient's family in the case of pediatric care) can show benefits to the patient in terms of increased preventive care (Menec, Sirski, & Attawar, 2005; Rosenthal, 2008), treatment compliance and receipt of needed specialty services (Rosenthal, 2008). Cabana and Jee (2004) conducted a meta-analysis and found that having this sustained relationship was associated with more preventive care, reduced hospitalizations and emergency department visits and increased patient satisfaction. And in the special case of CSHCN, those who had a usual source of care (versus not) had less unmet mental health care need (Ganz & Tendulkar, 2006).

Receiving adequate care coordination is another enabler in accessing needed mental health services. Coordinated care is an extension of comprehensive care whereby the physician guides access to needed services and communicates with other health care providers, community services and with the family (Arend, Tsang-Quinn, Levine, & Thomas, 2012). In a national study conducted by Audet and colleagues, 87% of primary care physicians believed this team approach improves the quality of patient care (Audet, Davis, & Schoenbaum, 2006). And, while there are few studies available, one recent randomized trial of children with ADHD and their families showed that implementing a coordinated care approach between mental health and medical care was associated with higher rates of mental health treatment initiation and completion, improved child behavioral outcomes, reduced parental stress and improved patient satisfaction (Kolko et al., 2014). For children with special health care needs, more unmet need for mental health was reported when there was insufficient care coordination (Tang, et al., 2008).

Homer and colleagues (2008), in their meta-analysis of 33 articles, investigated the benefits of the federal Maternal and Child Health Bureau recommendation that CSHCN receive care within a medical home and found that care coordination was beneficial to children's mental health service utilization and outcomes.

A final component within the medical system that may facilitate mental health service utilization is receiving a referral for services from one's primary doctor when it is needed (Arend et al., 2012). Specifically, collaboration between medical and mental health care providers and receiving a needed referral to specialty mental health treatment improves outcomes in both areas of health (Rosenthal, 2008). Miller, Nugent, Gaboda, and Russell (2013) also showed that, among children with special healthcare needs, a barrier to accessing mental health services was a lack of referrals to services for children.

Traditional Need Factors. Need factors comprise the third traditional component in predicting service utilization, according to Gelberg-Andersen's model. Need factors include a professional diagnosis that a child has an emotional or behavioral disorder and the parent's/caretaker's perceived severity of that disorder. A further distinction can be made between children who have externalizing versus internalizing conditions and their associations with mental health service utilization. Externalizing mental health conditions include those conditions in which the child exhibits behavior problems that are outwardly directed on the external environment (Liu, 2004). These negative behaviors consist of disruptive, hyperactive and aggressive behaviors, and are in contrast to internalizing mental health conditions that affect the child's internal psychological environment rather than the external world. Anxious, withdrawn, inhibited and depressed behaviors are consistent with an internalizing condition (Liu, 2004). These behaviors,

whether internal or external, show different relationships with both mental health utilization and unmet mental health need for youth and are described next.

Though children with externalizing conditions typically have higher utilization rates, they also have higher unmet need. In one study, adolescents with ADHD and oppositional defiant disorder (ODD) reported increased mental health services utilization compared to those with no or another diagnosis (Cornelius et al., 2001). This was also supported by Merikangas, et al., (2011) in their study using a national sample. They found adolescents with behavioral disorders (e.g., ADHD, ODD and conduct disorder) had higher rates of mental health treatment when compared to those with mood disorders, anxiety problems or substance abuse. However, in a national sample of youth ages 6-17 years, individuals with depression or anxiety received treatment at higher rates than those with a behavioral or conduct disorder, though differences were small (Ghandour, Kogan, Blumberg, Jones, & Perrin, 2012).

Additionally, youth with a conduct disorder, a clinically-elevated subset of externalizing behaviors, reported more unmet need than children without that diagnosis (Cornelius et al., 2001). A meta-analysis of research on treatment dropout showed that having more externalizing problems was a significant predictor of leaving treatment early (de Haan et al., 2013). And Johnson, Mellor, and Brann (2008) found that children with ODD, conduct disorder, and those with ADHD have higher dropout rates from treatment than children with anxiety disorders or no diagnosis, suggesting more externalized behaviors may increase dropout rates. Finally, for youth who have illicit drug dependence or abuse, only 10% even receive treatment (Substance Abuse and Mental Health Services Administration, 2015), suggesting a huge gap in service access for this specific need.

The perceived severity of mental health need also is associated with children's receipt of mental health services, though results are dependent on the outcome studied (e.g., utilization or drop out). Morrissey-Kane and Prinz (1999) reported that the caretaker's perception of the child's higher symptom severity increased the likelihood for service initiation; however, higher pretreatment levels of problem behaviors were significantly associated with premature dropout from services (de Haan et al., 2013). According to Ganz and Tendulkar (2006), CSHCN who were rated by their caretaker as more severely affected by their mental health condition were more likely to have unmet mental health needs compared to those whose caretaker rated them as less severely affected. However, studies using both iterations of NSCAW data found increased mental health service utilization among youth with more severe emotional and behavioral problems as rated by parent report on the CBCL (Farmer et al., 2010; Horwitz et al., 2012). Similarly, studies utilizing GSMS data showed an increased severity of child's impairment increased mental health service utilization (Burns et al., 1995; Farmer et al., 1999). These differences point out that children with more severe conditions are more likely to utilize mental health services; however, they are also more likely to dropout prematurely and have higher unmet need as the services they are receiving do not fully meet their needs.

Vulnerability Domain

Vulnerability Predisposing Factors. For children who have experienced ACEs, vulnerability factors in the predisposing, enabling and need categories also are present that may predict the likelihood of mental health service utilization. Vulnerability factors are those that act as a barrier or facilitator for service utilization that are especially relevant to the vulnerable population (Gelberg et al., 2000). Predisposing vulnerability factors include adverse childhood experiences, which are in and of themselves family factors. There are also other parent/caretaker factors

related to stress and coping that are prevalent in children who have experienced adversity and associated with the likelihood that a child receives needed mental health services (Burnett-Zeigler & Lyons, 2010; de Haan et al., 2013; Kazdin et al., 1997; Kutash et al., 2012; Mayberry & Heflinger, 2011; Morrissey-Kane & Prinz, 1999; Salloum et al., 2016).

Adverse childhood experiences. The ACEs themselves can be defined as a vulnerability predisposing factor for children with mental health needs, particularly because family dysfunction is recognized as an indicator of inconsistent mental health service utilization for children. As previously discussed in chapter one, research is limited, and results are mixed in those studies that examine the relationship between ACEs and mental health services utilization. Studies using national survey data on children involved in the child welfare system show increased mental health service use for children whose families show risk factors related to adversity (Farmer et al., 2010; Horwitz et al., 2012). While other studies not using this population, (e.g., adolescent males, children in a prevention program), show adversity factors result in higher unmet mental health need in children (Cornelius et al., 2001; Owens et al., 2002). Therefore, the current study helps to fill this gap and to clarify these relationships for children who have an identified mental health need.

Family functioning factors. Family functioning variables are another set of predisposing vulnerability factors that can influence the impact of adversity on children and their mental health service utilization. Many studies define family functioning primarily by measuring parental stress, coping, aggravation with parenting, and family conflict. Balistreri and Alvira-Hammond (2015), using U.S. population data, showed that family functioning was a significant moderator of the relationship between the total ACE score and adolescent health and well-being. Adolescents whose families had positive family functioning, measured as positive,

frequent parent-child interaction and low levels of parental stress, showed a lessened negative effect from childhood adversity on adolescent health and well-being than those adolescents with negative family functioning and, therefore, may serve as a protective factor in the face of increasing adversities.

Negative family functioning is associated with lower mental health service utilization for children, but there are some differences across studies. Increased parenting stress, difficulty parenting and harsh child rearing practices have all been related to increased rates of accessing mental health services in a small sample ($n = 242$) of children seen in an outpatient clinic, but also premature drop out of services (Kazdin et al., 1997). In other studies, stress and parenting problems are associated with a higher level of perceived treatment barriers, leading to a decrease in service utilization (Kazdin & Wassell, 2000; Owens et al., 2002). A longitudinal study that followed children who were either maltreated or at-risk of maltreatment prior to age four years showed that high parent/caretaker stress had a highly significant association with reduced use of mental health services when the child's mental health need was reported as significant (Thompson et al., 2007). Brown, Green, Desai, Weitzman, and Rosenthal (2014), utilizing NSCH data from 2007, also showed parent stress was associated with higher unmet mental health need. Similarly, Brannan, Heflinger and Foster (2003) found that increased caretaker anger and resentment, which are considered signs of high levels of caretaker stress, were associated with shorter time in treatment and increased risk of inconsistent treatment. Parent/caretaker coping is typically studied as a part of the broader umbrella of parent/caretaker factors that affect overall parent/caretaker functioning and efficacy. Lack of efficacy about parenting acts as a barrier to mental health service utilization for children (Baker-Ericzen et al., 2013). De Haan and colleagues (2013), in their meta-analysis, found that failure to supervise or

monitor children routinely and/or harsh parenting were significant predictors of treatment dropout.

Vulnerability Enabling Factors. Vulnerability enabling factors that are associated with mental health services utilization include family and systems factors. Family factors are related to parental emotional support. School and child welfare systems factors are also vulnerability enabling factors as these systems may influence service utilization for children who have experienced adversity.

Studies are mixed on the role parent/caretaker social support plays in a child receiving needed mental health services. It appears the main reason for this is that different studies have used different measures for social support. One longitudinal study of inner city youths showed parents/caretakers with greater social supports (spoke with someone prior to accessing services and found it helpful) are more likely to access mental health services for their youth (Harrison, McKay, & Bannon Jr, 2004). However, in a study of 266 children identified at high risk of ADHD in a school setting, greater parent social support (have a person(s) to talk to and depend on when they have concerns about the child's health, behaviors or emotions) was associated with less service utilization for these children (Bussing et al., 2003). Finally, in a study of 574 children participating in the Fort Bragg Evaluation Project, there was no association between parent/caretaker affirmational support (ability to confide in, agreement with parenting decisions) and mental health services utilization (Brannan et al., 2003). However, increased instrumental support (help with parenting responsibilities) decreased service utilization and affective support (feeling liked or loved) increased service utilization (Brannan et al., 2003).

Systems enabling factors. Systems enabling vulnerability factors for children with adverse experiences include those related to the school system and the child welfare system.

First, studies have established the relationship between childhood adversity and school-related outcomes. Childhood adversity is associated with lower cognitive and executive functioning in children, with worsening outcomes as cumulative ACE scores increase (Guinosso, Johnson, & Riley, 2016). Additionally, Bethell and colleagues (2014) conducted a study using the National Survey of Children's Health data to assess the association between childhood adversity and school engagement factors. In addition to showing that children who have experienced adversity are more likely to be a child with a special healthcare need, including emotional and behavioral disorders, they also found that children who experienced at least two ACEs were 2.67 times more likely to repeat a grade than children who had not experienced adversity. In primary school, children with emotional or behavioral disorders are also more likely to have school failure (Mundy et al., 2017).

Chronic school absenteeism is also associated with adversity, and with mental health problems like anxiety, mood and disruptive behavior disorders (Kearney & Graczyk, 2014). Egger, Costello, and Angold (2003) found truancy was significantly associated with both psychopathology and ACEs in their study using GSMS data. And Stempel, Cox-Martin, Bronsert, Dickinson, and Allison (2017) also found a relationship between ACEs and chronic absenteeism in a U.S. population study. Coming to the attention of school personnel, through problems requiring special education, by repeating a grade, or through chronic absenteeism may increase the likelihood of receiving services for this vulnerable population. While less is known about the relationships between service utilization and truancy or repeating a grade, research has studied special education and mental health services utilization.

Receipt of special education services increases the likelihood that a child will receive needed mental health services (Pandiani, Banks, Simon, Van Vleck, & Pomeroy, 2005). In a

study using the National Health Survey data, 40% of children who received mental health services were also in special education services (Stein & Silver, 2003). Additionally, in a study using the U.S. National Comorbidity Survey Adolescent Supplement (NCS-A), receiving early intervention special education services predicted later mental health service use (Green et al., 2013). Other studies offer further support that being involved in special education enables mental health service utilization. George, Zaheer, Kern, and Evans (2018), in a study of 647 students using data from the Center for Adolescent Research in Schools (CARS), established that students with emotional or behavioral problems who had a special education classification were twice as likely to receive community-based mental health services when compared to students in general education.

By virtue of whom the child welfare system serves, most children whose families are involved with this system have experienced adversity. The child welfare system has also been shown to influence mental health services utilization in youth. As was reported in Chapter 1, studies using the NSCAW and NSCAW-II data show that mental health treatment utilization is increased for youth who are served by the child welfare system, when there is high risk of further abuse (Farmer et al., 2010; Horwitz et al., 2012). Children in foster care are also much more likely to receive needed mental health care services compared to other youth in need of services (Halfon et al., 2017; Lyons & Rogers, 2004).

Vulnerability need factors. Vulnerability need factors are similar to traditional need factors. However, for children with ACEs, there is increased perceived severity of mental health symptoms in this vulnerable population. Brown, Brown, Briggs, German, Belamarich, and Oyeko (2017) showed that children who have experienced two or more ACEs are more likely to have their ADHD condition rated moderate or severe in a national study. Balistreri and Alvira-

Hammond (2015) showed a similar relationship between ACE exposure and emotional problems in adolescence also using a national dataset. For this study, the difference between severity as a vulnerability and traditional need variable is a matter of degree and only a conceptual distinction.

Summary

The effects of adverse childhood experiences have been studied for several decades, including in adults and children. Over time, the definition of ACEs has expanded to include traumatic experiences, such as racial discrimination, growing up in poverty, and witnessing neighborhood violence that may be associated with mental health and other health outcomes in more racially/ethnically and socioeconomically diverse or vulnerable groups of youth. ACEs have also been studied using various methodologies, whether individually, as a cumulative ACE score or by clustering them in subgroups; however, regardless of methodology ACEs are associated with poor outcomes in children and, though more limited research has been conducted, with mental health services utilization. Evidence on the relationship of ACEs to mental health services utilization has shown inconsistent findings. Studies show an increased need for services among those children who have experienced adversity, but whether that translates into increased services utilization is still unclear.

Child and family demographics, adversity and other parent/caretaker factors, need and systems-related factors all influence the likelihood that children receive needed mental health services, although some results have been less consistent including those related to a child's age, the type of insurance coverage, and parental social support. While family dysfunction decreases the likelihood of a child receiving services, children who are exposed to ACEs and other family dysfunction factors show more significant emotional or behavioral symptoms that could bring them to the attention of professionals in certain systems. The child welfare and school systems

in turn could facilitate access to mental health services for these vulnerable children. Studies of the child welfare system show this to be the case, while the findings related to the school system are more preliminary. The medical system could also act as a facilitator for services; this system has been shown to improve access for all children and not just those who have experienced adversity. The Gelberg-Andersen Behavioral Model of Vulnerable Populations takes into account the multitude of traditional and vulnerability predisposing, enabling and need variables that interact to affect services utilization, and is useful in studying mental health service utilization in children who have experienced adversity.

Goals of this Research

This study builds on the previous research reviewed in several ways. It recognizes children who have experienced adversity as a vulnerable population who are at increased risk of emotional and behavioral problems and of needing mental health care. It uses a theoretical framework that incorporates a robust set of predisposing, enabling and need factors that encompass not only child and family factors, but systems factors as well. The current study seeks to address several important gaps in the literature for children in the general U.S. population who need mental health services. This includes identifying whether children with adverse experiences utilize mental health services at different rates than children who have not experienced adversity. It also seeks to understand the role of parent/caretaker vulnerability and systems factors for whether children who have experienced adversity receive mental health services.

Traditional and vulnerability predisposing, enabling and need factors are assessed using the Gelberg-Andersen Behavioral Model for Vulnerable Populations. Traditional domains that influence mental health service utilization in children are related to child and family

demographic factors, medical system factors and needing services. Vulnerability domain factors that make children who have experienced adversity more vulnerable to not receiving services are related to parent/caretaker functioning (parent/caretaker stress, parent/caretaker coping, parent/caretaker emotional support) and the ACEs themselves. Vulnerability systems factors are related to the school-system (repeated a grade, receipt of special education services) as children who have experienced adversity are more likely to come to the attention of school professionals who could act as facilitators for services. Medical and school system variables will also be examined as potential moderators by increasing the likelihood of children receiving mental health services by lessening the effect of family vulnerability variables. The professionals in these systems are more likely to refer and get children into the services they need, even when the family is unable to do so.

Study Aims

The aims of this study are to:

- 1) Examine the relationships between mental health services utilization and adverse childhood experiences (ACEs) in children ages 6-17 years;
- 2) Evaluate parent/caretaker vulnerability variables as predictors of mental health services utilization for children who have experienced adversity; and
- 3) Assess systems variables as predictors of mental health services utilization for children who have experienced adversity.

Hypotheses

- 1) Among children with mental health needs, those who experience adversity (have experienced one or more ACEs) will have *higher* mental health services utilization rates compared to children who have not experienced adversity.

- 2) For children who have experienced adversity, having increased parent/caretaker vulnerability, defined by: (a) *Predisposing*: increased parent/caretaker stress, poor parent/caretaker coping and a higher cumulative ACE score; and (b) *Enabling*: reduced parent/caretaker emotional support, will be negatively associated with mental health service utilization after adjusting for the traditional variables.
- 3) For children who have experienced adversity, school-system variables that are *enabling*, by bringing children to the attention of school professionals such as repeating a grade in school and current receipt of special education services, will be positively associated with mental health services utilization after adjusting for the traditional variables.
- 4) For children who have experienced adversity, medical system variables that facilitate access to services (*Enabling*: having a personal doctor or nurse, adequate care coordination, having insurance, having adequate insurance) will be positively associated with mental health services utilization after adjusting for other traditional variables.
- 5) For children who have experienced adversity, enabling school- and medical-system variables will moderate parent/caregiver vulnerability by reducing their negative effect on mental health services utilization after adjusting for the traditional variables.

CHAPTER 3

Methodology

This study is a secondary data analysis of the 2016 National Survey of Children's Health (NSCH). The NSCH survey provides information on the health and well-being of children over several domains. These domains include access to and utilization of health care, receipt of care in a patient-centered medical home, family interactions, parental health, school and after-school experiences, and neighborhood characteristics.

Overview of NSCH

Sampling Strategy

The 2016 NSCH sample was compiled using 364,150 household addresses from the Census Master Address File (MAF). Stratified random sampling at the state-level produced approximately equal numbers of completed questionnaires for all children and children with special health care needs in each state and the District of Columbia. A screener questionnaire was used to identify occupied residences and households with eligible children ages 0-17 years. If eligible children were in the household, a more detailed, age-specific questionnaire was sent to the household. The screener also included a series of specific health impact questions used to determine whether each eligible child was a Child with Special Health Care Needs (CSHCN). One child was randomly selected as the subject of the interview if more than one child lived in the household. The selected child was categorized into one of the three age-specific groups for completion of the topical questionnaire: children aged 0-5, 6-11, or 12-17 years. CSHCN were oversampled in the 2016 NSCH and since older children are more likely to have reported special health care needs, children aged 0-5 years were separately oversampled (The United States Census Bureau, 2018).

Data Collection

Data for the 2016 NSCH was conducted via internet or mail from June 2016 through February 2017 by the United States Census Bureau, Associate Director for Demographic Programs on behalf of the United States Department of Health and Human Services (HHS), and the Health Resources and Services Administration's (HRSA) Maternal and Child Health Bureau (MCHB). This A total of 50,212 interviews were completed nationally by parents or caregivers of non-institutionalized children ages 0-17 years (The United States Census Bureau, 2018).

The parent or caregiver with knowledge of the sampled child's health and health care responded to the questionnaire, which was determined by an initial question asking for the adult most familiar with the child's health and health care in the household. Respondents were able to complete the questionnaire in one of two ways. First, they received a web survey invitation. If they did not respond to the initial two web survey invitations, a paper screener was mailed to them, which they filled out and mailed back. If the screener indicated they were eligible, a survey was then mailed (The United States Census Bureau, 2018). Of the total households, 53% (139,923) were screened for eligibility. Of those screened, 68,961 reported having an age eligible child in the home and 50,212 completed the topical questionnaire. In total, 40,492 (80.6%) parents/caregivers completed the web-based survey and 9,719 (19.4%) completed the paper survey. The overall weighted response rate for the survey was 40.7% (The United States Census Bureau, 2018).

Sample of the Current Study

The current study utilizes data from the ages 6-11- and 12-17-year-old questionnaires because parents/caretakers of children ages 0-5 years ($n = 14,494$) did not receive the ACEs questions section. The current analysis includes weighted data for a subset of the total sample,

which are children 6-17 years old at the time of the interview and identified by the parent or caretaker as having a mental or behavioral condition for which they needed treatment or counseling in the past twelve months, whether or not the child received these services. These $N = 5,723$ children are included in the analysis of hypothesis one. The remaining children in the overall sample were not used in this study as they were not reported to need mental health treatment or counseling in the past twelve months ($n = 29,540$). Further analyses to test hypotheses two through five use a smaller subset of these 6-17-year-old children to include weighted data for those children who were reported by the parent or caretaker as having experienced at least one childhood adversity ($n = 3,812$).

Study Measures

The variables for this study's aims were chosen in congruence with the Gelberg-Andersen Behavioral Model for Vulnerable Populations. Traditional variables are those that have been shown to have an effect on mental health services utilization of children and youth in general, regardless of adversity. On the other hand, vulnerability domain variables are those factors that may impact services utilization and are especially relevant to children who have experienced adversity. Under Gelberg-Andersen's model, both traditional and vulnerability variables fall under three domains: predisposing, enabling and need. This study includes *predisposing, enabling, and need* variables related to traditional and vulnerability domains (see Table 1).

Table 1. Factors associated with mental health treatment utilization for vulnerable children with mental health needs

TRADITIONAL DOMAINS		
<u><i>Predisposing</i></u> Child age Child sex Child race/ethnicity Education level of parent Family structure	<u><i>Enabling</i></u> Family income level Type of insurance Adequate insurance Personal doctor or nurse Adequate care coordination	<u><i>Need</i></u> Externalizing mental health condition Perceived severity of child’s condition
VULNERABILITY DOMAINS		
<u><i>Predisposing</i></u> Parental stress Parental coping ACEs of child	<u><i>Enabling</i></u> Parental emotional support Repeated a grade in school Receipt of special education	<u><i>Need</i></u> Increased perceived severity of child’s condition

Dependent Variable

Mental Health Services Utilization. A dichotomous variable measures whether the child received mental health treatment or counseling. For this measure the parent or caretaker was asked, “during the past 12 months, has [your child] received any treatment or counseling from a mental health professional? Mental health professionals include psychiatrists, psychologists, psychiatric nurses, and clinical social workers.” Answers were coded as (0) no, but this child needed to see a mental health professional; (1) yes, child received needed treatment; or (2) no, this child did not need to see a mental health professional. Those children whose parents/caretakers answered (2) are not included in the current study because it focuses on children with mental health needs.

Traditional Domain Variables

Predisposing. Child and family demographics are considered traditional predisposing variables. The child’s age, sex, and race/ethnicity, the highest education level achieved in the household by

a parent/caretaker, and family structure were included in the study. *Age* is an ordinal variable coded (3) 6-7; (2) 8-11; (1) 12-14; and (0) 15-17 years; ages 6-17 years were used for the current study. The age variable was reverse ordered to set the oldest age group as the reference group in the analyses. *Sex* was a dichotomous variable coded as, male (0) and female (1). Respondents answered separate questions about the *child's race and Hispanic/Latino ethnicity*, which combined into four categories: (0) White, non-Hispanic; (1) Hispanic; (2) Black, non-Hispanic; (3) and Multi-racial/Other, non-Hispanic. *Household education* was defined by the highest level of education received between the two primary caretakers, if there was more than one, or using the highest level of education completed if there was only one caretaker. Highest level of education was coded as: (0) less than high school education, no GED; (1) high school diploma or GED; (2) some college or technical school; and (3) college degree or higher. *Family structure* was coded (0) two-parent family; (1) single parent family; (2) single parent and other caretaker; (3) other relative (nonparent) caretaker(s); or (4) non-relative caretaker(s).

Enabling. Traditional variables in the enabling domain consisted of family resource variables that assist the family in their ability to access needed services. Variables included family income level and those measuring aspects of the medical system. *Family income level* is categorized based on the 2016 federal poverty level guidelines (FPL), which indicated whether the child was living in a home: (0) 0-99% of the FPL; (1) 100-199% FPL; (2) 200-399% FPL; or (3) 400% or greater FPL. The federal poverty level is issued annually by the Department of Health and Human Services to determine eligibility for certain programs and benefits, such as Medicaid. The guidelines are based on household income and family size (U.S. Centers for Medicare & Medicaid Services, 2018).

Enabling medical-system variables. There are five medical-system related variables. The first two measure health insurance coverage. *Type of insurance* was coded: (0) currently uninsured; (1) public insurance, which includes Medicaid or other government assistance plan for low income individuals and families or individuals with a diagnosed disability; (2) private insurance; or (3) child has both public and private insurance. *Adequacy of current insurance* was derived from five questions. Respondents were asked about current health insurance coverage; whether coverage was sufficient to meet the child's needs; how much they paid out-of-pocket for child's healthcare and how often these costs were reasonable; and whether insurance allows the child to see needed health care providers. Responses to each question were: always, usually, sometimes, never, or currently uninsured. If always or usually was chosen for all questions, adequate insurance was coded (2) current insurance adequate for child's needs. If always or usually is *not* chosen for all questions, adequate insurance was coded (1) current insurance not adequate for child's needs. If the child is currently uninsured, then adequate insurance was coded (0) currently uninsured.

The last three medical-system variables are considered traditional enabling variables as well, given their demonstrated effect on all children receiving services (Aysola et al., 2013; Baker-Ericzen et al., 2013; Ganz & Tendulkar, 2006; Headman & Cornille, 2008; Homer et al., 2008; Miller et al., 2013; Strickland et al., 2011). *Having a personal doctor or nurse* is a dichotomous variable (no = 0; 1 = yes). Personal doctor or nurse is defined as a health professional who knows the child well and is familiar with the child's health history; this can be a general doctor, a pediatrician, a specialist doctor, a nurse practitioner or a physician's assistant. *Adequate care coordination* (Child and Adolescent Health Measurement Initiative (CAHMI), 2018) is a composite variable constructed by assessing communication between doctors when

needed; between doctor and schools when needed; and getting needed help coordinating care. Response options for these three questions were very satisfied, somewhat satisfied, somewhat dissatisfied and very dissatisfied. If the parent/caretaker answered somewhat dissatisfied or very dissatisfied for any question, the answer was coded (0) did not receive one or more elements of care coordination. Children not seeing more than one healthcare professional were coded (1) did not need care coordination. If the parent/caretaker answered somewhat satisfied or very satisfied for each question, the answer was coded (2) received all needed components of care coordination. *Receipt of needed referrals* combined two questions. First, did the child need a referral in the last 12 months? If yes, how much of a problem was it getting the referral? Responses were coded: (0) did not need a referral; (1) had no problems getting a referral when needed; and (2) had problems getting a referral when needed.

Need. Traditional need included two variables based on a professional evaluation of the child's need and the perceived need by the child's parent/caretaker. First, the professional evaluation focused on whether the child had an *externalizing mental health condition*. Specifically, the parent/caretaker responded (yes/no) to a series of questions about whether or not a doctor or other provider ever said the child had anxiety, depression, a behavioral problem, substance use disorder, ADHD, or any other mental health condition. For each condition the parent/caretaker affirmed, a follow-up question asked (yes/no) if the condition was current. Parent/caretaker responses to these questions were combined into three categories, with externalizing defined by a behavioral problem, substance use disorder, and/or ADHD: (0) never told child has an externalizing condition; (1) yes, previously told the child has an externalizing condition, but not currently; and (2) yes, current externalizing mental health condition. The never group includes children reported to have anxiety, depression and/or any other mental health condition. Second,

the parent/caretaker's evaluation of need included their perception of the *severity of the child's mental health condition*. Parents/caretakers of a child with any current mental health condition indicated whether the condition was (1) mild, (2) moderate or (3) severe. The parent/caretaker could also respond that the child has (0) no current condition. If the child had more than one condition, the highest rating of severity was used to define this variable.

Vulnerability Domain Variables

Predisposing. Variables included in the vulnerability predisposing domain include those related to family functioning that could differentially affect children who have experienced adversity in accessing mental health services. *Vulnerability predisposing variables* included the parent/caretaker's answers to questions about adverse childhood experiences (ACEs), parent/caretaker stress, and parent/caretaker coping.

Adverse childhood experiences. The *ACEs questions* were derived from a modified version of the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente Adverse Childhood Experiences Study (Felitti et al., 1998), which is a reliable, valid screen for the retrospective study of ACEs and has been used in many studies on different populations (Ford et al., 2014; Pinto, Correia, & Maia, 2014). In this dataset, adverse events included: 1) socio-economic hardship; 2) separation/divorce of a parent; 3) death of a parent or caretaker; 4) parent incarceration; 5) saw or heard parents or adults slap, hit, kick, and/or punch one another in the home; 6) victim of neighborhood violence; 7) living with someone who was mentally ill, suicidal or severely depressed; 8) living with someone with an alcohol or drug problem; and 9) experienced discrimination or unfair treatment due to race or ethnicity. Studies of ACEs often use different indicators to define childhood adverse experiences. For example, other studies include questions about physical and sexual abuse and neglect (Anda et al., 2007; Burns et al.,

1995; Shin et al., 2018). The NSCH survey did not ask questions about these events in order to minimize underreporting associated with social desirability bias as recommended by a technical expert panel and evaluated using standard cognitive interviewing based on survey item testing through the Centers for Disease Control (Bethell, Carle, et al., 2017).

All ACEs items were dichotomous (yes = 1; no = 0) except for economic hardship, which was coded (0) never, (1) rarely, (2) somewhat often, or (3) very often difficult to get by on family income. The economic hardship variable was recoded into two categories; respondents who reported it is either somewhat often or very often difficult to get by on family income were coded (1) experienced this ACE, while those who responded it is never or rarely difficult were coded (0) did not experience this ACE. A cumulative score for each respondent was created by summing the total number of ACEs as a count of yes responses. This variable was re-coded: (0) no adverse experiences; (1) experienced one ACE; (2) experienced two ACEs; (3) experienced three ACEs; and (4) experienced four or more ACEs. The final category included respondents who identified four or more ACEs because beyond this count the number of ACEs experienced became infrequent, from 7.23% (four ACEs) to 0.04% (nine ACEs). This variable was also used to identify the subset of children who experienced at least one ACE for the analyses conducted to test hypotheses two through five.

Predisposing parent/caretaker variables. *Parent/caretaker stress* was measured by combining three variables. Respondents were asked: In in the past month, how often have you felt: (a) that [your child] is much harder to care for than most children his or her age; (b) that [your child] does things that really bother you a lot; and (c) angry with [your child]? The possible responses for each question were: never, rarely, sometimes, usually and always. If a parent/caretaker chose usually or always to at least one of the three questions, the

parent/caretaker stress variable was coded (1) parent/caretaker usually/always feels stress from parenting. Otherwise the responses were coded (0) parent/caretaker seldom experiences stress from parenting. *Parent/caretaker coping* was measured using one question which asked, “How well do you think you are handling the day to day demands of raising children?” Respondents answered either (0) very well; (1) somewhat well; or (2) not very well or not very well at all.

Enabling. Vulnerability enabling variables included questions related to parental emotional support and two school-system variables: repeating a grade in school and receipt of special education services.

Enabling parent/caretaker variable. *Parent/caretaker emotional support* was measured based on an affirmative answer to the question, “Is there someone you can turn to for day-to-day emotional help with parenting or raising children?” (yes = 1; no = 0).

Enabling school-system variables. *Repeated a grade in school* was coded (0) has not repeated any grades since starting kindergarten; or (1) has repeated at least one grade since starting kindergarten. *Receipt of special education services* was coded (0) has never had a special education or early intervention plan; (1) has had a special education or early intervention plan, but not currently; or (2) currently receives services under a plan.

Need. As stated previously, need variables are an externalizing mental health condition and severity of any mental health condition. They are described once, under the traditional domain, as the distinction between traditional and vulnerability need variables is only conceptual.

Data Analysis

Stata MP, version 15 (StataCorp., 2107) was the primary statistical package used for this study, including for all data preparation steps, preliminary analyses, descriptive statistics, and logistic regression models. The latent class analysis and subsequent analyses using the class

variable were conducted in Mplus 8 (Muthen & Muthen, 2017). These software packages were selected because NSCH's complex survey design necessitates statistical applications that can incorporate its special design features (strata, cluster, and weight variables). These design variables are used to appropriately calculate the variances, associated standard errors, and confidence intervals for accurate statistical hypothesis testing (Child and Adolescent Health Measurement Initiative (CAHMI), 2018). The *svyset* command was used for all STATA analyses. In Mplus, the complex analysis command was applied with variable command options for stratification, cluster, and weight.

Data Preparation

The primary analyses for the current study utilized logistic regression because the mental health services utilization variable is dichotomous. Logistic regression has several assumptions, including missingness, absence of outliers, the adequacy of expected frequencies, and multicollinearity. These assumptions were assessed during data preparation. First, data were prescreened to identify study variables with coding irregularities or missing cases. The missing data analysis included inspecting univariate statistics of each variable checking for variables with 5% or greater missing cases. No study variables met this threshold. This is partially because, in the NSCH dataset, variables with a high amount of missing cases included imputed data. This includes the federal poverty level variable, which had 18.6% missing values. Sex, race, Hispanic ethnicity and adult highest education level also had imputed data (Child and Adolescent Health Measurement Initiative (CAHMI), 2018). Sex, race and Hispanic ethnicity were imputed using hot-deck imputation; and adult highest education level and family poverty level were imputed using sequential regression imputation methods (United States Census Bureau, 2017).

A review for univariate outliers was completed by observing frequency tables and applying a threshold of 90% or more responses in one category for each categorical variable (Tabachnick & Fidell, 2013). No variables met this threshold. Mahalanbious distance was used to prescreen for multivariate outliers. Because this technique, though widely used and without readily available alternative methods, is not a perfectly reliable indicator of multivariate outliers, a very conservative probability estimate of $p < .001$ was used as suggested by Tabachnick and Fidell (2013). No multivariate outliers were observed.

Finally, data were screened for expected frequencies and the absence of multicollinearity. Contingency tables were reviewed for each dependent variable-independent variable pair to ensure all expected cell frequencies were greater than one and no more than 20% were less than five (Tabachnick & Fidell, 2013). All paired variables met this threshold. Bivariate Pearson correlations among independent variables were next inspected to look for intercorrelations above $r = 0.80$. The adequate insurance variable was not used as a covariate in hypothesis testing, as originally planned, due to its high correlation with insurance type.

Descriptive Statistics

Univariate statistics were used to characterize the two study samples. Because all study variables were categorical, these statistics were frequencies and percentages. The first sample ($N = 5,723$) includes any child, 6-17 years old, identified by the parent/caretaker as having a mental or behavioral condition for which the child needed treatment or counseling in the past twelve months. The second sample ($n = 3,812$) is the subset of these children who have experienced at least one childhood adversity.

Bivariate Relationships

Simple relationships were examined as preliminary steps to understand how the characteristics of the study sample relate to whether children experienced adverse events and received mental health services. In the first sample of children with mental health needs, chi-square tests were used to identify associations with study variables for children who have experienced one ACE, two ACEs, three ACEs, and four or more ACEs. Because of the large number of bivariate tests conducted, the method developed by Benjamini and Hochberg (1995) was used to adjust the p -value threshold for determining statistical significance to reduce the possibility of false positives. There were 49 total bivariate comparisons tested, and the adjusted p -value was calculated after all tests were run. First, the calculated p -values for each bivariate test were ordered from smallest to largest and then ranked, starting with the smallest, in ascending order (i.e., the smallest p -value was ranked one, the next smallest two, etc.). Each calculated p -value then was checked to determine if it was smaller than its False Discovery Rate (FDR) corrected p -value. The FDR equaled the calculated p -value multiplied by the total number of tests conducted and divided by the p -value rank. The largest calculated p -value that was still smaller than or equal to the FDR corrected p -value became the adjusted p -value threshold for all tests.

In addition, a second set of bivariate tests were carried out in both the first sample and the second sample, which was the subset of children who experienced adversity. These bivariate tests were conducted for modeling purposes to select variables for inclusion in multivariate models. Simple logistic regressions examined the relationship between study variables and children's mental health services utilization. Here, a p -value threshold of 0.20 was used (Hosmer, Lemeshow, & Sturdivant, 2013). Unlike the earlier application of a more conservative

threshold, this p -value is recommended because the lower p -value of .05 often fails to identify variables known to be important (Hosmer et al., 2013).

Hypothesis Testing

Hypothesis 1: Among children with mental health needs, those who experience adversity (have experienced one or more ACEs) will have higher mental health services utilization rates compared to children who have not experienced adversity.

The first hypothesis was tested using two different statistical approaches. The first approach included using multivariate logistic regression models to examine the relationship of the number of ACEs experienced (0, 1, 2, 3, or 4 or more) to mental health services utilization. The second used a latent class analysis approach (LCA) to examine the relationship of homogenous classes of children with and without ACEs to mental health services utilization. The patterns of responses to the nine ACEs indicators were used to generate the subgroups of ACEs, which were then evaluated in a LCA regression model in association with the distal outcome mental health services utilization. The methods used in conducting these approaches are further described below.

Multivariate Logistic Regression. This analysis examined differences in mental health service utilization for those children who have and have not experienced adversity. A p -value threshold of .05 was applied in all analyses for hypothesis testing. This logistic regression model was tested in two steps. The cumulative adversity categorical variable (0 ACEs, 1 ACE, 2 ACEs, 3 ACEs, and 4 or more ACEs) was entered in the model first. Having zero ACEs was the reference group and compared with the four other ACEs categories. Next, covariates (i.e., traditional domain variables) were added to determine if the association between level of adversity and mental health services utilization was statistically significant after adjusting for the traditional

predisposing (sex, race/ethnicity, education level of the parent/caretaker, family structure), enabling (family income level, insurance type) and need variables (externalizing mental health condition, perceived severity of child's condition).

Latent Class Analysis (LCA). The LCA approach for hypothesis one involved testing three models that build on each other: a *measurement model*, *structural model* and *regression model*.

The overall purpose of this analysis was to examine differences in mental health services utilization rates across homogeneous ACEs subgroups; this was tested with the final model.

There were two intermediate models. The first model, *the LCA measurement model*, determined the best number of homogenous classes based on the nine ACE characteristics. The second model, *the LCA structural model*, evaluated whether those classes were differently associated with the traditional predisposing, enabling and need covariates used in the logistic regression models (sex, race/ethnicity, education level of the parent/caretaker, family structure, family income level, insurance type, externalizing mental health condition, and perceived severity of child's condition). The third model, *LCA regression*, tested the relationship of each class to the distal outcome, mental health services utilization, while accounting for the effect of the covariates on the classes and on service utilization. These models and the methodology are described below. As was previously described, and re-stated briefly here, these analyses were conducted using Mplus 8 as this statistical software package is capable of conducting latent class analysis and subsequent regression models while accounting for complex sampling procedures. The subpopulation of children over the age of five years who reportedly needed mental health treatment in the last twelve months were selected for these analyses.

LCA measurement model. The measurement model involved determining the best-fitting number of classes for the ACEs indicators. Latent classes were estimated using only the nine

adverse childhood experiences variables as latent class indicators. There were no covariates included in the model. A series of models specified with increasing numbers of latent classes were run (k , $k+1$, etc.), beginning with a one-class model. This continued sequentially until the point at which the model was not well identified, as determined by a condition number less than 10^{-6} , poor replication of the best loglikelihood, and/or a substantial number of unperturbed start values that did not converge.

The specified models were compared to determine the best-fitting model by examining the following statistics: loglikelihood value, Akaike information criteria (AIC) (Akaike, 1974), Bayesian information criterion (BIC) (Schwarz, 1978), adjusted BIC (n-adj. BIC), and the Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMRT) (Lo, Mendell, & Rubin, 2001). A higher log likelihood value indicates better fit. Smaller values for the AIC, BIC and n-adj. BIC indicate a better fitting model. LMRT evaluates the fit of the target model by comparing it to the model with one less class and examining the p -value to determine if the target model ($p < .05$) is a better fit than the comparison model.

Model interpretability and the accuracy of the classification were evaluated by examining the average posterior probabilities, entropy values and the size of each class (Nylund, Asparouhov, & Muthén, 2007). The goal was to identify a model where each latent class had good separation from the other classes on the ACEs indicators as well as good homogeneity within each class. Additionally, classes that include less than 5% of the respondents were considered too small (Masyn, 2013). Average posterior probability values greater than 0.80 indicated adequate separation between classes (Masyn, 2013). A profile plot was created with class-specific item probabilities plotted for each ACEs indicator to evaluate class separation and homogeneity graphically. Adequate homogeneity is evidenced by item response probabilities for

a class falling above 0.70 and/or below 0.30, but not in between (Masyn, 2013). Entropy values also determine the accuracy of the classification. An entropy value closer to one suggests greater accuracy of classification, with values greater than .60 being considered sufficient (Geiser, 2013). Classes were also evaluated based on theoretical meaning. This involved understanding the items endorsed at a high rate or low rate in that class and how these clusters of items may be related to previous literature and theoretical understanding.

LCA structural model. The second model, the LCA structural model, used a *manual three-step maximum likelihood (ML) method* (Asparouhov & Muthén, 2014) to test the relationship of each latent class to the traditional covariates, as used in the hypothesis one logistic regression model. The manual three-step ML approach was selected because this method has been shown to outperform other approaches for analyzing relationships between a latent class variable and other categorical variables (Asparouhov & Muthén, 2014; Bakk, Tekle, & Vermunt, 2013). As a data preparation step, dummy variables were created for covariates that had more than two categories. For the family structure variable, the other relative (nonparent) caretaker(s) category and non-relative caretaker(s) category were combined because of the small number of the non-relative caretakers. The first step in the manual three-step method estimated the measurement part of the model (Asparouhov & Muthén, 2014). The best-fitting measurement model was re-run. At the second step the most likely class variable, which is the variable that assigns each respondent to the class most likely endorsed, and measurement error for this variable were calculated. At the third step, the most likely class variable was regressed on the traditional covariates, while taking into account the measurement error in the most likely class variable from step two.

LCA regression model. The third and final model was a latent class regression that, again, used the manual three-step ML method (Asparouhov & Muthén, 2014). The first two steps were the same as described above. At the third step, a latent class regression model was estimated with mental health services utilization variable included as a categorical distal outcome. This step again used the most likely class variable (this time as a predictor variable) and accounted for the measurement error computed at step two. The LCA regression model tested the relationship of each latent class to mental health services utilization in the past year. The model accounted for the effect of covariates on the classes and utilization. Similar to the multivariate logistic regression models estimated, only covariates that were associated with the most likely class variable and mental health services utilization at a p -value threshold of 0.20 were included in the model. As previously described, this p -value was applied because the lower p -value of .05 often fails to identify variables known to be important (Hosmer et al., 2013).

Hypothesis 2: For children who have experienced adversity, having increased parent/caretaker vulnerability defined by: (a) Predisposing: increased parent/caretaker stress, poor parent/caretaker coping and a higher cumulative ACE score; and (b) Enabling: reduced parent/caretaker emotional support, will be negatively associated with mental health service utilization after adjusting for the traditional predictor variables.

To examine the second hypothesis, multivariate logistic regression was again used, this time to examine the association between parent/caretaker vulnerability variables and mental health services utilization. Only children who were reported to need mental health treatment in the past year and had experienced at least one ACE were included in this analysis. The model was tested in three steps. First, the cumulative adversity categorical variable was entered. The parent/caretaker vulnerability variables (parent/caretaker coping, parent/caretaker support) were

entered next. Finally, traditional predisposing (sex, race/ethnicity, education level of the parent/caretaker, family structure), enabling (family income level, insurance type) and need variables (externalizing mental health condition, perceived severity of child's condition) were entered as covariates in order to determine the relationship of the parent/caretaker vulnerability variables with mental health services utilization after adjusting for traditional predictors of mental health services utilization in children.

Hypothesis 3: For children who have experienced adversity, school-system variables that are enabling, by bringing children to the attention of school professionals such as repeating a grade in school and current receipt of special education services, will be positively associated with mental health services utilization after adjusting for the traditional variables.

To examine this hypothesis, multivariate logistic regression was again used, this time to examine the association between school-system vulnerability variables and mental health services utilization. Only children who were reported to need mental health treatment in the past year and had experienced at least one ACE were included in this analysis. The model was tested in three steps, as previously described. Briefly, the cumulative adversity variable was entered; school-system vulnerability variables (repeated a grade in school, receipt of special education services) were entered next; and finally, traditional predisposing, enabling and need variables, which were the same as in the previous hypotheses, were entered as covariates.

Hypothesis 4: For children who have experienced adversity, medical-system variables that facilitate access to services (Enabling: having a personal doctor or nurse, adequate care coordination, having insurance) will be positively associated with mental health services utilization after adjusting for other traditional variables.

To examine this hypothesis, multivariate logistic regression was used, this time to examine the association between medical-system enabling variables and mental health services utilization. Similar to hypotheses two and three, only children who were reported to need mental health treatment in the past year and had experienced at least one ACE were included in this analysis. The model was tested in three steps. First, the cumulative adversity categorical variable was entered; medical-system traditional variables (type of insurance, personal doctor or nurse, adequate care coordination) were entered next; and finally, traditional predisposing, enabling and need variables, were entered as covariates. The covariates in this model were similar to those in the previous hypotheses, except in this hypothesis the insurance variable was used as a medical-system variable and not as a covariate. This is because this hypothesis looks at the medical system as a whole in terms of its facilitation of children receiving mental health services, and insurance is part of that system.

Hypothesis 5: For children who have experienced adversity, enabling school- and medical-system variables will moderate parental/caretaker vulnerability by reducing their negative effect on mental health services utilization after adjusting for the traditional variables.

This analysis started with the final model from hypothesis two, which included: the cumulative adversity variable; parent/caretaker vulnerability variables (parent/caretaker coping, parent/caretaker support); and the traditional predisposing (sex, race/ethnicity, education level of the parent/caretaker, family structure), enabling (family income level, insurance type) and need variables (externalizing mental health condition, perceived severity of child's condition). Next, the medical- and school-system variables that were identified as potential moderators (repeated a grade in school; receipt of special education services; adequate care coordination; personal doctor or nurse) were added in order to evaluate their moderating role on the relationships

between the parental/caretaker vulnerability variables and mental health services utilization in the past twelve months. These variables were selected because of the direct role that an educator or provider can play as a facilitator to services for a child with an identified mental health need (Farmer, Burns, Angold, & Costello, 1997; Farmer et al., 1999). Other school- and medical-system variables were not included because they are indirectly related to these systems in that there is not a professional who can link the child to services. In estimating the model, first, the main effects of all variables were examined after adjusting for the traditional variables (covariates). As a next step, the interaction effects were examined in the model. Interaction terms were created as the product of the pair of each system variable and each parent/caretaker vulnerability variable. In total, there were eight interaction terms, which were estimated in the model one at a time. Statistically significant interaction effects ($p < .05$) were plotted to visually evaluate their effect.

CHAPTER 4

Results

Sample Characteristics

Sample 1: Children with Mental Health Needs

The first sample consisted of children over the age of five years who needed mental health treatment or counseling in the past 12 months. This sample, drawn from the U.S. population, included 5,723 children. A description of sample one is below, organized by the dependent variable, traditional and vulnerability domains and predisposing, enabling and need variables within each domain. The description begins with the dependent variable.

Dependent Variable.

In the sample, the vast majority of children utilized needed mental health treatment or counseling in the last 12 months (86.93%, $n = 4,781$). The remaining 13.07% ($n = 719$) did not use needed mental health services.

Traditional Domain Variables.

Predisposing. For this sample, the largest age group was 15-17- year-olds who comprised 38% ($n = 2,172$) of the sample. The 8-11- and 12-14-year-old age groups each comprised approximately one-quarter of the sample (26.75%, $n = 1,499$; and 26.43%, $n = 1,481$ respectively). By far, the smallest group were 6-7-year-olds who comprised 8.05% of the sample ($n = 448$). There were slightly more males than females (51.34% versus 48.66%). The group was predominantly White, not Hispanic (71.99%, $n = 4,040$). Hispanic children comprised 11.10% ($n = 614$) and children who were Black, not Hispanic comprised 6.38% ($n = 357$) of the sample. The remainder of the sample were identified by their parent/caretaker as another race/ethnicity or multiracial, not Hispanic (10.53%, $n = 588$). The majority of children in this

sample had at least one parent/caretaker who was a college graduate (58.40%, $n = 3,212$). An additional quarter had a parent/caretaker who completed some college (25.35%, $n = 1,394$). About fourteen percent (13.58%, $n = 747$) had a high school diploma or GED, while only 2.67% ($n = 147$) had a parent/caretaker who did not complete high school. Children in the sample also predominately lived in a two-parent family (67.65%, $n = 3,670$). The next largest family structure consisted of living in a single-parent family (19.26%, $n = 1,045$). The remaining 13.09% of children ($n = 885$) lived with a single-parent and another caretaker (5.71%, $n = 310$), another relative caretaker (6.51%, $n = 353$) or a non-relative caretaker (0.87%, $n = 47$).

Enabling. The children in this sample were primarily living above the FPL at 400% or greater (41.06%, $n = 2,316$). The next largest group were those children living between 200 and 400% of the FPL (28.82%, $n = 1,626$), followed by 17.21% living at 100% to 199% of the FPL ($n = 971$). The remaining children lived below the FPL (12.91%, $n = 728$).

Enabling medical-system variables. The children in this sample were largely insured (97.23%). Only 2.77% ($n = 154$) were uninsured. Regarding type of insurance, 63.23% ($n = 3,519$) were privately insured, 27.28% ($n = 1,518$) had public insurance and the remainder had both public and private insurance (6.72%, $n = 374$). Regarding adequate insurance, most reported being adequately insured (61.73%, $n = 3,466$) and 35.53% ($n = 1,995$) reported not having adequate insurance coverage. The remaining were uninsured as reported in type of insurance. In this sample, most children were reported to have a personal doctor or nurse (81.85%, $n = 4,586$) with only 18.15% reporting not to have a personal doctor or nurse ($n = 1,014$). Approximately half of the children in this sample were reported to have received all needed components of care coordination (47.24%, $n = 2,651$) and 19.01% reported their child did

not need care coordination ($n = 1,062$). However, about one-third reportedly did not receive all needed components of care coordination (33.65%, $n = 1,886$).

Need. Approximately half (51.44%, $n = 2,840$) of the sample currently had an externalizing mental health condition. Children who never had an externalizing mental health condition were the next largest group representing 44.90% of the sample ($n = 2,479$). The remaining 3.66% previously had an externalizing condition, but not currently ($n = 202$). Regarding the severity of any mental health condition as perceived by the parent/caretaker, 26.18% ($n = 1,477$) of children did not have a condition. For those children with a condition, moderate severity was the largest group (36.82%, $n = 2,077$). For the next largest group, the severity of the child's condition was reported as mild (22.96%, $n = 1,295$) and the smallest group included children with a severe mental health condition (14.04%, $n = 792$).

Vulnerability Domain Variables.

Predisposing. The vulnerability predisposing variables consisted of the number of ACEs a child has experienced and parent/caretaker factors. Approximately one-third of children in this sample were reported by the parent/caretaker to have never experienced an adversity (32.79%, $n = 1,827$) and another quarter experienced one ACE (23.37%, $n = 1,302$). An additional 15.83% of children ($n = 882$) reportedly experienced two ACEs, about one-tenth three ACEs (10.43%, $n = 581$). The remaining 17.58% ($n = 1,008$) reported experiencing four or more ACEs.

Predisposing parent/caretaker variables. In this sample of children who needed mental health treatment or counseling in the past year, slightly over three-quarters of their parents/caretakers reported seldom or never feeling stress from parenting during the preceding month (78.56%, $n = 4,401$). The remaining 21.44% of children ($n = 1,199$) had parents/caretakers who reported usually or always feeling stress from parenting over the past

month. Most children had parents/caretakers report they were coping with the day-to-day demands of raising children either somewhat well (49.36%, $n = 2,767$) or very well (46.36%, $n = 2,594$). A smaller group of parents/caretakers (4.28%, $n = 239$) reported coping not very well to the demands of raising a child.

Enabling. Vulnerability enabling variables consist of one parent/caretaker variable and two school-system variables.

Enabling parent/caretaker variable. Most children had a parent/caretaker who reported they had someone to turn to for day-to-day emotional support (79.26%, $n = 4,428$). The remaining 20.74% of children ($n = 1,159$) had parents/caretakers who reported they did not have someone that they could turn to for emotional support.

Enabling school-system variables. Most children in this sample have never repeated a grade in school (90.19%, $n = 4,975$). However, a smaller group of children had reportedly repeated at least one grade since starting kindergarten (9.81%, $n = 541$). Most parents/caretakers report that their child never received special education services (62.52%, $n = 3,509$), but a little over one-quarter of the children were currently receiving special education services (27.22%, $n = 1,541$). The remaining children had previously received special education services, but were not currently (9.93%, $n = 558$).

Need. Need variables were described above under the traditional domain and are not repeated here. The difference between traditional and vulnerability need was conceptual only; see Chapter two for a description of the conceptual model for this study. This way of presenting the results for the need variables will remain for all further descriptions and analyses in this chapter.

Sample 2: Children with Mental Health Needs who have Experienced Adversity

This second sample consisted of all children over the age of five years who reportedly needed mental health treatment or counseling in the past 12 months and who also were reported by their parent/caretaker to have experienced one or more ACEs ($n = 3,812$). In general, these children were predominately White, not Hispanic, had health insurance, and lived in a household whose income was at 200% or greater of the FPL. Approximately half of these children lived with a college-educated parent/caretaker, and lived in a two-parent household. Below, a more detailed description of the second sample is provided.

Dependent Variable.

Most of the children in this sample utilized needed mental health services (85.79%, $n = 3,213$). The remaining children did not use such services (14.21%, $n = 532$).

Traditional Domain Variables.

Predisposing. In this sample, the largest age group was 15-17-year-olds (39.25%, $n=1,470$). The 8-11-year-old age group made up about one quarter of the sample (25.66%, $n = 961$) as did the 12-14-year-old group (27.32%, $n = 1,023$). The smallest group consisted of children who were 6-7 years old (7.77%, $n = 291$). This sample was almost evenly split between males and females (50.73% versus 49.27%). The group was predominantly White, not Hispanic (68.84%, $n = 2,578$). The size of the Hispanic and other/multiracial, not Hispanic groups were about even, each with a little over one-tenth of children being Hispanic (11.91%, $n = 446$) and other race/ethnicity or multi-racial, not Hispanic (11.43%, $n = 428$). Children who were Black, not Hispanic comprised 7.82% ($n = 293$) of the sample. Approximately half of children had at least one parent/caretaker who completed college (49.84%, $n = 1,837$) and an additional 30.44% ($n = 1,122$) had at least one parent/caretaker who attended some college. Another 16.28% of

children ($n = 600$) had a parent/caretaker who completed high school or obtained their GED, while the remaining 3.45% of children ($n = 127$) had a parent/caretaker whose educational level was less than a high school education. About half of the children in this sample lived in a two-parent family (53.94%, $n = 1,957$). The next largest family structure was a single-parent family (27.62%, $n = 1,002$). The remaining family structures represented in the sample were small and totaled less than 10%, including single-parent with another caretaker, another relative caretaker and non-relative caretaker.

Enabling. This sample of children was split more evenly than the first sample between FPL groups. About one-third of the sample lived in a household of 400% or greater FPL (31.05%, $n = 1,163$), another one-third between 200-400% FPL (31.08%, $n = 1,164$), and 21.26% of children ($n = 796$) lived between 100-199% FPL. Seventeen percent of children lived below FPL (16.61%, $n = 622$).

Enabling medical-system variables. In this sample, most children had health insurance; only 3.44% ($n = 127$) were uninsured. A little over half had private insurance (52.63%, $n = 1,944$), while 36.22% ($n = 1,338$) had public insurance and 7.72% ($n = 285$) had both public and private insurance. Similar to the larger sample, most reported having adequate health insurance coverage for their child (62.29%, $n = 2,322$). Thirty-four percent (34.31%, $n = 1,279$) reported not having adequate insurance and the remaining were uninsured (the same percentage as reported above). Other aspects of the medical system include having a personal doctor or nurse and receiving all needed components of care coordination. Most of the children in this sample had a personal doctor or nurse (79.95%, $n = 2,974$), while 20.05% ($n = 746$) did not. In regards to care coordination, 44.18% of parents/caretakers ($n = 1,646$) reported their children received all components of care coordination when needed. Another 19.75% ($n = 736$) reported their child

did not need care coordination, but 36.07% of parents/caretakers ($n = 1,344$) reported their child did not receive all needed elements of care coordination.

Need. In this sample, a little more than half of the children were reported to currently have an externalizing mental health condition (54.56%, $n = 1,998$) and a small portion previously did, but do not currently have an externalizing mental health condition (3.85%, $n = 141$). The remaining 41.59% of children ($n = 1,523$) were never assessed by a professional as having an externalizing condition. Regarding the parent/caretaker's perception of the severity of any mental health condition, 25.10% of children ($n = 940$) did not have a condition; 20.88% ($n = 782$) had a condition with mild severity; 37.57% ($n = 1,407$) reported a condition with moderate severity; and 16.45% ($n = 616$) reported a severe condition.

Vulnerability Domain Variables.

Predisposing. The number of adversities a child reportedly experienced and parent/caretaker variables were vulnerability predisposing variables in this study. A little more than one-third of the children reportedly experienced one ACE (34.77%, $n = 1,302$). Slightly less than one-quarter experienced two ACEs (23.55%, $n = 882$) and 15.51% ($n = 581$) experienced three ACEs. The remaining 26.17% of children in this sample experienced four or more ACEs ($n = 980$).

Predisposing parent/caretaker variables. Most children (76.51%, $n = 2,860$) had a parent/caretaker report seldom or never feeling stress from parenting over the previous month, while 23.49% ($n = 878$) reported usually or always feeling stress from parenting over the past month. Most children also had a parent/caretaker report coping somewhat well (50.86%, $n = 1,896$) or very well (43.78%, $n = 1,632$) with the day-to-day demands of raising children. A

smaller percentage (5.36%, $n = 200$) reported coping not very well with the demands of raising children.

Enabling. Vulnerability enabling variables consist of one parent/caretaker variable and two school-system variables.

Enabling parent/caretaker variable. In this sample of children who have experienced at least one ACE, 77.26% of children had a parent/caretaker report having someone to turn to for day-to-day emotional support ($n = 2,877$). Just under one-quarter of parents/caretakers did not have someone to turn to for emotional support (22.74%, $n = 847$).

Enabling school-system variables. Nearly 90% of children in this sample never repeated a grade in school (88.46%, $n = 3,242$); the remaining 11.54% of children ($n = 423$) repeated at least one grade in school since starting kindergarten. In this sample 61.39% never received special education services ($n = 2,291$); 28.27% ($n = 1,055$) are currently receiving special education services; and 10.34% ($n = 386$) have previously, but are not currently, receiving special education services.

Bivariate Relationships

Two sets of bivariate tests were conducted, with the results presented below by study sample. In the first sample, there were statistically significant associations found between most study variables and children experiencing specific numbers of ACEs, including after adjusting for multiple testing. Based on the method developed by Benjamini and Hochberg (1995) the p -value threshold for determining statistical significance was adjusted from $p < 0.05$ to $p < 0.03$. Second, in the first and second samples, relationships between study variables and mental health services utilization were evaluated for model development. Those relationships that met the $p < 0.20$ threshold were retained for inclusion in multivariate models (Hosmer et al., 2013).

Relationships with ACEs Categories

Sample 1: Children with Mental Health Needs.

In the sample of children with mental health needs (first sample), there were statistically significant associations between children who have not experienced ACEs and children who have experienced one, two, three, or four or more ACEs and variables in both the traditional and vulnerability domains. First, differences for the traditional domain variables are presented in this section, followed by differences for the vulnerability domain variables.

Traditional Domain Variables. Table 2 shows comparisons between the five ACEs categories and the traditional domain variables described separately according to whether they were predisposing, enabling, or need variables. This is also how the remaining results sections were organized.

Predisposing. There were statistically significant differences between children who experienced no adversity and different levels of adversity for all predisposing variables except age and sex. Race/ethnicity showed a significant association with the cumulative ACEs variable. Higher percentages of White children experienced no adversity, whereas children who were Hispanic, Black, and other race/ethnicity or multi-racial had higher percentages who experienced adversity at some level. There were more than twice as many Black children who experienced one ACE compared to zero and almost three times as many to experience four or more ACEs as compared to no ACEs. Similarly, for children from other races/ethnicities or multiracial children there were almost twice as many who experienced four or more ACEs as compared to zero ACEs. Twice as many children who had a parent/caretaker with a four-year college degree experienced no ACEs versus four or more ACEs. However, for children whose parent/caretaker had less than a college degree it was the opposite; there were higher percentages who

experienced one or more ACEs versus no experience of adversity. More specifically, the percentages of children whose parent/caretaker had a high school diploma/GED or some college and experienced four or more ACEs were more than twice as large as the no ACEs category. The percentage difference between experiencing four or more and no ACEs was even larger (four times) for those children whose parent/caretaker had less than a high school diploma. Additionally, all children in households with family structures other than a two-parent family had more children who experienced adversity. The percentage of children living with a non-parent relative caretaker who experienced four or more ACEs was over ten times more than the percentage for no ACEs. Half as many children in two-parent families experienced two, three, or four or more ACEs compared to no ACEs.

Enabling. Federal poverty level (FPL) and medical-system variables are traditional enabling variables; the results for the medical-system variables are described in a separate section below. The FPL varied significantly between the cumulative ACEs categories. At higher levels of adversity, the percentages of children living below or 100-199% of the FPL were larger than for no ACEs. This especially was the case for children who lived under 100% of the FPL; the percentage of children who experienced four or more ACEs was five-times greater than those children who had not experienced an ACE. Conversely, at 400% or greater FPL, the percentage of children experiencing one, two, three, and four or more ACEs incrementally decreased. For children who lived at 200-399% FPL, the percentages were largest for one and two ACEs and smallest for no ACEs.

Need. Need variables also were significantly associated with cumulative experiences of adversity. More children with a current externalizing condition experienced adversity, and the percentages incrementally increased with the number of adversities. It was the opposite for

children never told they had an externalizing condition, in that as the number of adversities increased, their percentages incrementally decreased. Interestingly, the percentages of children previously, but not currently, having an externalizing condition, were similar across adversity levels (between 3 and 4%). Mental health severity was associated with ACEs in a similar way; the percentages of children having a severe condition were largest at higher levels of adversity and the percentages of children having a mild condition or no condition were largest at lower adversity levels. Conversely, the percentages of children with a moderately severe mental health condition were similar except at the three and four or more ACEs levels, which were higher.

Table 2. Traditional Variables: Comparisons across the five categories of ACEs (*N* = 5,723)

	No ACEs % (<i>n</i>)	One ACE % (<i>n</i>)	Two ACEs % (<i>n</i>)	Three ACEs % (<i>n</i>)	4+ ACEs % (<i>n</i>)	<i>p</i> -value
Predisposing						
Age						
6-7 years old	8.95% (171)	7.87% (105)	7.70% (69)	6.77% (40)	8.10% (80)	.1810
8-11 years old	27.68% (529)	25.37% (339)	25.75% (231)	25.04% (148)	26.52% (262)	
12-14 years old	25.22% (482)	25.67% (343)	28.09% (252)	31.98% (189)	26.41% (261)	
15-17 years old	38.15% (729)	41.09% (549)	38.46% (345)	36.21% (214)	38.97% (385)	
Sex (male)	53.17% (1016)	51.87% (693)	51.84% (465)	50.42% (298)	48.79% (482)	.2490
Race/ethnicity						
Hispanic	9.52% (182)	10.18% (136)	12.26% (110)	13.54% (80)	13.66% (135)	<.0001
White, not Hispanic	78.39% (1498)	73.42% (981)	69.34% (622)	68.36% (404)	61.74% (610)	
Black, not Hispanic	3.30% (63)	6.89% (92)	8.25% (74)	8.29% (49)	8.81% (87)	
Other/multiracial, not Hispanic	8.79% (168)	9.51% (127)	10.15% (91)	9.81% (58)	15.79% (156)	
Caretaker Education						
Less than high school	1.32% (25)	2.81% (37)	3.73% (33)	2.74% (16)	5.08% (49)	<.0001
High school or GED	8.42% (159)	12.40% (163)	14.58% (129)	21.54% (126)	20.75% (200)	
Some college	15.15% (286)	22.96% (302)	31.86% (282)	31.97% (187)	37.24% (359)	
College degree	75.11% (1418)	61.83% (813)	49.83% (441)	43.75% (256)	36.93% (356)	
Family Structure						
Two-parent	95.60% (1780)	71.79% (934)	53.43% (460)	42.66% (247)	36.92% (350)	<.0001
Single parent	2.15% (40)	20.45% (266)	33.22% (286)	33.68% (195)	28.16% (267)	
Single parent with other caretaker	1.06% (20)	4.30% (56)	8.01% (69)	11.40% (66)	11.08% (105)	
Other relative caretaker	0.97% (18)	3.23% (42)	4.99% (43)	10.88% (63)	20.89% (198)	
Nonrelative caretaker	0.21% (4)	0.23% (3)	0.35% (3)	1.38% (8)	2.95% (28)	
Traditional Enabling						
Income Level						
0-99% FPL	4.87% (93)	9.66% (129)	15.16% (136)	20.64% (122)	25.81% (255)	<.0001
100-199% FPL	8.90% (170)	15.42% (206)	22.63% (203)	24.70% (146)	26.21% (259)	
200-399% FPL	24.80% (474)	31.81% (425)	33.78% (303)	28.26% (167)	28.75% (284)	
400+ FPL	61.43% (1174)	43.11% (576)	28.43% (255)	26.40% (156)	19.23% (190)	
Need						
Externalizing Condition						
Never told	53.27% (994)	47.70% (621)	45.68% (397)	42.34% (246)	31.23% (302)	<.0001
Previous but not current	3.27% (61)	4.22% (55)	3.34% (29)	3.10% (18)	4.34% (42)	
Current	43.46% (811)	48.08% (626)	50.98% (443)	54.56% (317)	64.43% (623)	
Severity of Condition						
Does not have condition	31.14% (595)	29.79% (398)	28.21% (253)	26.06% (154)	19.03% (188)	<.0001
Mild	26.48% (506)	23.50% (314)	21.96% (197)	16.58% (98)	18.21% (180)	
Moderate	33.54% (641)	34.06% (455)	34.56% (310)	40.27% (238)	41.40% (409)	
Severe	8.84% (169)	12.65% (169)	15.27% (137)	17.09% (101)	21.36% (211)	

Note. ACE = adverse childhood experience; GED = general education diploma; FPL = federal poverty level.

Medical-system enabling variables. There were significant percentage differences between ACEs groups for the traditional medical-system variables (Table 3). The largest percentage of children with private insurance experienced no adversity, and there was an almost 50% decrease in children with private insurance between the no adversity and four or more ACEs groups. On the other hand, the percentage of publicly insured children was more than 5 times larger at four or more ACEs than at no ACEs. Children with both public and private insurance and those who were uninsured also had higher percentages who experienced four or more ACEs than no ACEs. One variable of note, adequate health insurance, showed a different trend in relation to cumulative ACEs. Children reported to have adequate health insurance experienced higher levels of ACEs, with a higher percentage with four or more ACEs than no adversity, though the differences across adversity levels were relatively small. A higher percentage of children who had a personal doctor or nurse experienced no adversity compared to having experienced one, two, three, or four or more ACEs. These differences, however, were also relatively small. There were incremental changes for children receiving or not receiving all the needed components of care coordination with higher ACEs counts. As the number of ACEs a child experienced increased, the percentage of children who received coordinated care decreased and the percentage of children who needed, but did not receive all components of care coordination increased.

Table 3. Medical System Variables: Comparisons across the five categories of ACEs (N = 5,723)

	<u>No ACEs</u>	<u>One ACE</u>	<u>Two ACEs</u>	<u>Three ACEs</u>	<u>4+ ACEs</u>	<i>p</i> -value
	%(<i>n</i>)	%(<i>n</i>)	%(<i>n</i>)	%(<i>n</i>)	%(<i>n</i>)	
Enabling						
Health Insurance						
Uninsured	1.33% (25)	2.13% (28)	3.53% (31)	5.27% (31)	4.42% (43)	<.0001
Public	9.47% (178)	20.61% (271)	31.55% (277)	40.86% (239)	58.58% (570)	
Private	84.67% (1591)	70.80% (931)	57.06% (501)	46.68% (273)	27.75% (270)	
Public and private	4.53% (85)	6.46% (85)	7.86% (69)	7.19% (42)	9.25% (90)	
Adequate Health						
Insurance						
Uninsured	1.32% (25)	2.11% (28)	3.50% (31)	5.28% (31)	4.37% (43)	<.0001
Not adequately insured	37.78% (717)	38.40% (510)	37.24% (330)	33.84% (199)	26.15% (257)	
Adequately insured	60.90% (1156)	59.49% (790)	59.26% (525)	60.88% (358)	69.48% (683)	
Personal Doctor/Nurse (yes)	85.31% (1615)	80.44% (1069)	79.73% (708)	80.07% (470)	78.78% (772)	<.0001
Care Coordination						
Did not need	18.69% (353)	20.00% (265)	20.85% (186)	19.59% (115)	19.86% (195)	<.0001
Needed/did not receive	28.00% (529)	33.36% (442)	33.52% (299)	37.82% (222)	40.12% (394)	
Received	53.51% (1007)	44.64% (618)	45.63% (407)	42.59% (250)	40.02% (393)	

Note. ACE = adverse childhood experience.

Vulnerability Domain Variables. Both predisposing and enabling vulnerability domain variables were significantly associated with children who had not versus who had experienced one, two, three, or four or more ACEs. These included predisposing and enabling parent/caretaker variables and enabling school-system variables. Parent/caretaker variables are described first (Table 4) and followed by school-system variables (Table 5).

Parent/caretaker variables.

Predisposing parent/caretaker variables. Both parent/caretaker coping and parent/caretaker stress showed significant differences across ACEs categories. For example, when children had a parent/caretaker who was coping very well, their percentages declined with each additional adversity experienced. The opposite occurred when a child had a parent/caretaker who was coping somewhat well or not very well; the percentages for these children increased with each additional ACE. In particular, the percentage was twice as large at four or more ACEs level than the no ACEs level for those children who had a parent/caretaker

not coping very well. In addition, parent/caretaker stress was positively associated with the number of ACEs; there was a more than 10% increase from experiencing no ACEs to four or more when a child’s parent/caretaker reported feeling usually or always stressed.

Enabling parent/caretaker variable. Furthermore, having a parent/caretaker with someone to turn to for day-to-day emotional support was negatively associated with the ACEs count. The percentages of children with a parent/caretaker with emotional support were smaller at higher levels of adversity, with, again, the largest percent difference between the no ACEs group and the three and four or more ACEs groups.

Table 4. Parent/Caretaker Variables: Comparisons across the five categories of ACEs (N = 5,723)

	<u>No ACEs</u> %(n)	<u>One ACE</u> %(n)	<u>Two ACEs</u> %(n)	<u>Three ACEs</u> %(n)	<u>4+ ACEs</u> %(n)	<i>p</i> -value
<u>Predisposing</u>						
Caretaker Coping						
Not very well	1.99% (38)	3.76% (50)	5.70% (51)	5.28% (31)	7.03% (69)	<.0001
Somewhat well	45.54% (868)	48.76% (649)	46.20% (413)	52.13% (306)	56.58% (555)	
Very well	52.47% (1000)	47.48% (632)	48.10% (430)	42.59% (250)	36.39% (357)	
Caretaker Stress (usually/always)	16.86% (321)	20.07% (268)	17.48% (93)	24.36% (143)	29.18% (288)	<.0001
<u>Enabling</u>						
Caretaker Support (yes)	82.54% (1565)	78.45% (1041)	76.82% (686)	75.21% (440)	76.52% (753)	<.0001

Note. ACE = adverse childhood experience.

Enabling school-system variables. The remaining variables in the vulnerability domain were two enabling school-system variables, which also showed significant differences across children who had not experienced adversity and experienced one, two, three, or four or more ACEs. The percentages of children who repeated a grade in school were higher at three or four or more ACEs compared not having experienced adversity. Similarly, the largest percentages of children who previously or currently received special education services experienced three or experienced four or more ACEs, while the percentage changes were in the opposite direction for children who never received special education services.

Table 5. School System Variables: Comparisons across the five categories of ACEs ($N = 5,723$)

	<u>No ACEs</u> %(n)	<u>One ACE</u> %(n)	<u>Two ACEs</u> %(n)	<u>Three ACEs</u> %(n)	<u>4+ ACEs</u> %(n)	<i>p</i> -value
Enabling						
Repeated a grade (yes)	6.10% (114)	8.75% (115)	10.70% (93)	13.47% (78)	14.75% (142)	<.0001
Special Education						
Never received	65.93% (1246)	64.20% (852)	62.85% (560)	58.97% (345)	58.64% (577)	.0050
Ever, but not current	8.94% (169)	9.12% (121)	9.43% (84)	11.79% (69)	11.69% (115)	
Currently receives	25.13% (475)	26.68% (354)	27.72% (247)	29.24% (171)	29.67% (292)	

Note. ACE = adverse childhood experience.

Relationships with Mental Health Services Utilization

Simple logistic regression models were run with one traditional or vulnerability variable in association with the dependent variable, mental health services utilization in the past year, to evaluate each variable for inclusion in multivariate logistic regression models for hypothesis testing. The determination of whether a variable met the threshold was based on the F statistic for the simple logistic regression model and a p -value of $< .20$, as recommended by Hosmer, Lemeshow, and Sturdivant (2013). For the variables that met the threshold, additional information about the relationship with mental health services utilization is described in the text. Tables in each section present odd ratios, 95% confidence intervals, and p -values for all traditional and vulnerability variables.

Sample 1: Children with Mental Health Needs.

First, traditional and vulnerability predisposing, enabling and need variables were evaluated in the first sample. This sample included all children who needed mental health treatment or counseling to include those who did not and who did experience adversity.

Traditional Domain Variables. Table 6 shows the simple logistic regression results for the traditional domain variables, described according to whether they are predisposing, enabling, or need variables.

Predisposing. The traditional predisposing variables that were identified for inclusion in later analyses for hypothesis testing included: sex [$F(1, 49,941) p = 3.93, p = .05$], race/ethnicity [$F(3, 49,939) = 2.49, p = .06$], parent/caretaker education level [$F(3, 49,798) = 20.8, p = .10$], and family structure [$F(4, 49,722) = 2.64, p = .03$]. The age of the child [$F(3, 49,939) = 0.08, p = .97$] was not associated with whether or not the child utilized needed mental health services and was not used in further hypothesis testing. Females were more likely than males to utilize needed services, and children who were Black, not Hispanic were almost half as likely as children who were White, not Hispanic to use needed services. Children who were Hispanic and those who were another race/ethnicity or multiracial, not Hispanic were no different than their White counterparts in utilizing needed services. Children who had a parent/caretaker who was college-educated were almost twice as likely to utilize needed mental health services compared to children whose parents did not have a high school diploma. Children whose parent/caretaker had some college were also more likely to utilize needed mental health services when compared to children whose parent/caretaker did not have a high school diploma or GED. Children who had a parent/caretaker with a high school diploma or GED were no more likely to utilize needed services when compared to children whose parent/caretaker did not complete high school. Interestingly, children who lived with another relative caretaker were half as likely to use needed mental health services, yet those who lived with a nonrelative caretaker were almost seven times more likely to utilize needed mental health services compared to children living in a two-parent family. Children living in a single-parent home or those with a single-parent and other caretaker were no more or less likely to utilize services than their peers who lived in a two-parent household.

Enabling. There was one traditional, non-medical-system enabling variable. This variable, family income based on the federal poverty level, met the threshold for inclusion, [$F(3, 49,939) = 9.38, p < .001$]. Children living at 200-399% FPL were almost twice as likely and children at 400% or over FPL were almost three times as likely to have utilized needed mental health services in the past year compared to children living below the federal poverty level. Children living at 100-199% FPL were also more likely to use needed mental health services than children living below FPL.

Need. Traditional need variables consisted of experiencing an externalizing mental health condition and perceived severity of any mental health condition. Whether or not the child ever or currently had an externalizing condition, $F(2, 49,820) = 1.74, p = .18$, and perceived severity of the child's condition, $F(3, 49,9939) = 5.11, p = .002$, both met the inclusion threshold for hypothesis testing. However, when compared with the reference group, children who were never told by a professional they had an externalizing condition, children who had a current or a previous, but not current externalizing condition were equally likely to use mental health services. For the severity of condition variable, children at all levels of severity were more likely to utilize needed mental health services compared to children who did not have a condition. Children whose condition was perceived as mild were almost twice as likely, as moderate one and a half times more likely, and as severe just over twice as likely to utilize needed mental health services when compared to children who did not have a condition.

Table 6. Simple logistic regressions with traditional variables and mental health services utilization ($N = 5,723$)

Variable	OR	95% CI	p-value
Predisposing			
Age ^a			
6-7 years	0.984	[0.62, 1.56]	0.945
8-11 years	0.910	[0.61, 1.35]	0.575
12-14 years	0.959	[0.65, 1.41]	0.829
Sex ^b	1.370	[1.00, 5.15]	0.048
Race/ethnicity ^c			
Hispanic	0.679	[0.45, 1.03]	0.071
Black, not Hispanic	0.608	[0.40, 0.92]	0.020
Other/multiracial, not Hispanic	0.957	[0.61, 1.49]	0.845
Caretaker Education ^d			
High School or GED	1.428	[0.75, 2.70]	0.274
Some college	1.678	[0.88, 3.21]	0.119
College degree	1.937	[1.07, 3.52]	0.030
Family Structure ^e			
Single-parent	1.068	[0.74, 1.54]	0.721
Single-parent with other caretaker	1.092	[0.64, 1.86]	0.746
Another relative caretaker	0.532	[0.29, 0.99]	0.046
Nonrelative caretaker	6.883	[1.42, 33.41]	0.017
Enabling			
Income Level ^f			
100-199% FPL	1.480	[0.95, 2.32]	0.087
200-399% FPL	1.722	[1.15, 2.57]	0.008
400%+ FPL	2.742	[1.87, 4.02]	<0.001
Need			
Externalizing Condition ^h			
Previous but not current	1.424	[0.57, 3.55]	0.447
Current	1.320	[0.98, 1.78]	0.421
Severity of Condition ⁱ			
Mild	1.980	[1.31, 2.99]	0.001
Moderate	1.500	[1.03, 2.18]	0.034
Severe	2.164	[1.38, 3.39]	0.001

Note. OR = odds ratio; CI = confidence interval; GED = general education diploma; p-value threshold: $p < .20$.

^aReference group = 15-17-year-olds; ^bReference group = male; ^cReference group = White, non-Hispanic;

^dReference group = less than high school degree; ^eReference group = two-parent family; ^fReference group = 0-99% FPL; ^gReference group = uninsured; ^hReference group = never told had an externalizing condition;

ⁱReference group = does not have condition.

Enabling medical-system variables. All medical-system variables were associated with use of needed mental health services (Table 7). Type of insurance [$F(3, 49,863) = 4.73, p = .003$], having a personal doctor or nurse [$F(1, 49,9903) = 9.31, p = .002$], and receiving all

elements of care coordination [$F(2, 49,907) = 14.49, p < .001$] each met the threshold of $p < .20$ for inclusion in hypothesis testing. All children with insurance, regardless of type, were about three to four times more likely to utilize mental health services than uninsured children. Children with both public and private insurance had the highest likelihood at four times more likely, and those with only public insurance the lowest, which was still almost three times as likely to utilize services compared to their uninsured counterparts. Children who had a personal doctor or nurse, versus not, were almost twice as likely to utilize needed mental health services. Finally, children who received all needed components of care coordination were more likely to use services, and those who did not need care coordination were half as likely to receive services when compared to those children who did not receive all components of care coordination.

Table 7. Simple logistic regressions with medical-system variables and mental health services utilization ($N = 5,723$)

Variable	OR	95% CI	p-value
Enabling			
Health Insurance ^a			
Public	2.949	[1.41, 6.19]	0.004
Private	3.712	[1.81, 7.60]	<0.001
Public and private	4.070	[1.64, 10.10]	0.002
Personal Doctor or Nurse ^b	1.732	[1.22, 2.47]	0.002
Care Coordination ^c			
Did not need	0.508	[0.35, 0.73]	<0.001
Received all components	1.479	[1.02, 2.14]	0.039

Note. OR = odds ratio; CI = confidence interval; p-value threshold < .20.

^aReference group = uninsured; ^bReference group = did not have a personal doctor or nurse; ^cReference group = did not receive all components of care coordination.

Vulnerability domain variables. In this section, parent/caretaker variables are described first (Table 8) followed by school-system variables, which are shown in Table 9.

Parent/caretaker variables.

Predisposing parent/caretaker variables. There are two predisposing vulnerability variables: parent/caretaker coping and parent/caretaker stress. Parent/caretaker coping met the

criterion for inclusion in later analyses, $F(2, 49,905) = 4.01, p = .02$, while parent/caretaker stress did not, $F(1, 49,906) = 0.39, p = .53$. Children with a parent/caretaker who was coping not very well were less than half as likely to utilize needed mental health services compared to children whose parent/caretaker was coping very well. Children who had a parent/caretaker coping somewhat well were also less likely to utilize mental health services when compare to those whose parent/caretaker is coping very well.

Enabling parent/caretaker variable. Parent/caretaker emotional support is the only enabling parent/caretaker variable, and it met the threshold for further inclusion, $F(1, 49,887) = 12.23, p < .001$. Children who had a parent/caretaker who reported emotional support were almost twice as likely to utilize needed mental health services compared to children who had a parent/caretaker without emotional support.

Table 8. Simple logistics regressions with parent/caretaker variables and mental health services utilization ($N = 5,723$)

Variable	OR	95% CI	<i>p</i> -value
<u>Predisposing</u>			
Caretaker Coping ^a			
Somewhat well	0.755	[0.55, 1.04]	0.085
Not very well	0.410	[0.21, 0.79]	0.008
Caretaker Stress ^b	1.120	[0.78, 1.60]	0.630
<u>Enabling</u>			
Caretaker Support ^c	1.825	[1.30, 2.56]	<0.001

Note. OR = odds ratio; CI = confidence interval; *p*-value threshold < .20.

^aReference group = caretaker coping very well; ^bReference group = caretaker rarely/never feels stress from parenting; ^c Reference group = caretaker has no emotional support.

Enabling school-system variables. Both school-system variables also met the inclusion threshold for hypothesis testing. These included repeating a grade in school, $F(1, 49,816) = 3.94, p = .05$, and receipt of special education services, $F(2, 49,921) = 3.07, p = .05$. Children who repeated a grade in school were about half as likely to utilize needed mental health services compared to children who had not repeated a grade. And children currently receiving special education services were one and a half times more likely to utilize needed services compared to

children who had never received special education services. Children who previously, but not currently, received special education services were also more likely to utilize services compared to those who have never received special education services.

Table 9. Simple logistic regressions with school-system variables and mental health services utilization ($N = 5,641$)

Variable	<i>OR</i>	95% <i>CI</i>	<i>p</i> -value
Enabling			
Repeated a grade ^a	0.605	[0.37, 0.99]	0.047
Special Education ^b			
Ever, but not current	1.340	[0.88, 2.04]	0.173
Currently receives	1.500	[1.07, 2.11]	0.019

Note. *OR* = odds ratio; *CI* = confidence interval; *p*-value threshold < .20.

^aReference group = did not repeat a grade; ^bReference group = never received special education services.

Sample 2: Children with Mental Health Needs who have Experienced Adversity.

Most traditional and vulnerability predisposing, enabling and need variables in the second subsample of children who experienced at least one ACE met the threshold for inclusion in further analyses and hypothesis testing. Some variables retained in the larger sample also were retained here, while others were not; all of the variables that were not associated with mental health services utilization at $p < .20$ in the first sample were also not associated in the smaller sample. Therefore, in this section, variables that had a similar relationship with mental health services utilization in both samples were first described briefly, and then those relationships that changed between the first and second sample were described in more detail. Those changes described included whether the *p*-value or the strength of the relationship, either larger or smaller, were noticeably different.

Traditional Domain Variables. Table 10 shows associations between the traditional domain variables and mental health services utilization, separately according to whether they are predisposing, enabling, or need variables.

Predisposing. Traditional predisposing variables that met the threshold for inclusion in multivariate models were: child's sex, $F(1, 50,016) = 5.95, p = .02$, and family structure, $F(4, 49,820) = 2.88, p = .03$. Females remained more likely than males to have utilized mental health services in the past year. Children living with another relative caretaker were half as likely, and those with a nonrelative caretaker were almost seven times more likely to have utilized mental health services compared to children living in a two-parent family, also similar to the first sample. Race/ethnicity, $F(3, 50,014) = 1.04, p = .37$, and education level of a parent/caretaker, $F(3, 49,984) = 0.80, p = .49$, did not meet the threshold in this smaller sample, though they did meet the threshold in the first one. Similar to sample one, age did not meet the threshold in this sample, $F(3, 50,014) = 0.12, p = .95$. Therefore, education level of a parent/caretaker and age were not used in further hypothesis testing. However, race/ethnicity was retained. While the race/ethnicity variable did not meet the p -value threshold for the model, the comparison between children who were Black, non-Hispanic and White, non-Hispanic met the threshold. Taking this, in combination with its importance as a covariate based on previous literature (Ganz & Tendulkar, 2006; Horwitz et al., 2012), it was retained and included in analyses conducted for hypothesis testing.

Enabling. This variable, family income based on the federal poverty level, met the threshold for use in further analyses, $F(3, 50,014) = 4.79, p = .002$, similar to the first sample; however, the odds of mental health services use were slightly lower. Children living at 200-399% FPL were one and a half times more likely to utilize services and children living at 400% or greater FPL were more than twice as likely to utilize needed services when compared to children living below FPL. Children living at 100-199% FPL were no longer different than children living below FPL in their use of mental health services.

Need. In this sample, the perceived severity of the child's mental health condition met the threshold for further inclusion, $F(3, 50,014) = 2.34, p = .07$. Children whose parent/caretaker reported the child's mental health condition as severe were almost twice as likely to utilize needed mental health services compared to those who did not have a mental health condition, similar to the first sample though the odds ratio is slightly lower. In this sample, children with a mild mental health condition were about one and a half times more likely to utilize services compared to children without a mental health condition, though the strength of the relationship was smaller. Unlike the first sample, having an external condition did not meet the threshold $F(2, 49,927) = 0.45, p = .636$. Hence, the externalizing condition variable was not utilized in further hypothesis testing for this sample.

Table 10. Simple logistic regressions with traditional variables and mental health services utilization ($n = 3,812$)

Variable	OR	95% CI	p-value
<u>Predisposing</u>			
Age ^a			
6-7 years	0.981	[0.56, 1.70]	0.946
8-11 years	0.880	[0.56, 1.37]	0.575
12-14 years	0.919	[0.61, 1.39]	0.946
Sex ^b	1.547	[1.09, 2.20]	0.015
Race/ethnicity ^c			
Hispanic	0.836	[0.52, 1.33]	0.450
Black, not Hispanic	0.670	[0.42, 0.92]	0.091
Other/multiracial, not Hispanic	0.981	[0.58, 1.65]	0.943
Caretaker Education ^d			
High School or GED	0.852	[0.42, 1.73]	0.656
Some college	0.992	[0.49, 2.03]	0.983
College degree	1.190	[0.60, 2.76]	0.623
Family Structure ^e			
Single-parent	1.153	[0.78, 1.71]	0.478
Single-parent with other caretaker	1.119	[0.64, 1.94]	0.689
Another relative caretaker	0.526	[0.28, 0.99]	0.048
Nonrelative caretaker	6.863	[1.39, 33.85]	0.018
<u>Enabling</u>			
Income Level ^f			
100-199% FPL	1.304	[0.81, 2.09]	0.270
200-399% FPL	1.554	[1.00, 2.41]	0.048
400%+ FPL	2.345	[1.49, 3.68]	<0.001
<u>Need</u>			
Externalizing Condition ^h			
Previous but not current	1.432	[0.49, 4.21]	0.515
Current	1.150	[0.82, 1.61]	0.421
Severity of Condition ⁱ			
Mild	1.465	[0.90, 2.39]	0.125
Moderate	1.104	[0.71, 1.71]	0.658
Severe	1.821	[1.09, 3.03]	0.021

Note. OR = odds ratio; CI = confidence interval; GED = general education diploma; p-value threshold < .20.

^aReference group = 15-17-year-olds; ^bReference group = male; ^cReference group = White, non-Hispanic;

^dReference group = less than high school degree; ^eReference group = two-parent family; ^fReference group = 0-99% FPL; ^gReference group = uninsured; ^hReference group = never told had an externalizing condition;

ⁱReference group = does not have condition.

Enabling medical-system variables. All medical-system variables met the threshold for inclusion in further analyses: insurance type [$F(3, 49,953) = 2.76, p = .04$]; having a personal doctor or nurse [$F(1, 49,988) = 5.48, p = .02$]; and receiving all needed elements of care coordination [$F(2, 49,990) = 8.18, p < .001$] (see Table 11). Similar to associations found with

the first sample, children with a personal doctor or nurse were more likely and those who did not need care coordination were less likely to utilize mental health services. Children with all three types of insurance were more than twice as likely to utilize needed mental health services compared to uninsured children, although the odds of children utilizing services were lower in this sample compared to the first sample. More specifically, in the larger sample, children with any of the insurance types had three to four times greater odds of utilizing services when compared to uninsured children. For the care coordination variable, those children who did not need care coordination remained less likely to use mental health services than children who needed, but did not receive all components of care coordination. Alternatively, children in this sample who received all needed components of care coordination no longer utilized services at a different rate than children who did not receive all components of care coordination.

Table 11. Simple logistic regressions with medical-system variable and mental health services utilization ($n = 3,812$)

Variable	<i>OR</i>	95% <i>CI</i>	<i>p</i> -value
<u>Enabling</u>			
Health Insurance ^a			
Public	2.442	[1.20, 4.95]	0.013
Private	2.738	[1.37, 5.46]	0.004
Public and private	2.702	[1.10, 6.66]	0.031
Personal Doctor or Nurse ^b	1.581	[1.08, 2.32]	0.019
Care Coordination ^c			
Did not need all components	0.531	[0.35, 0.80]	0.002
Received all components	1.274	[0.83, 1.96]	0.269

Note. *OR* = odds ratio; *CI* = confidence interval; *p*-value threshold < .20.

^aReference group = uninsured; ^bReference group = does not have a personal doctor or nurse; ^c Reference group = did not receive all components of care coordination.

Vulnerability Domain Variables. Both predisposing and enabling vulnerability domain variables met the threshold for use in further analyses for hypothesis testing. These included predisposing and enabling parent/caretaker variables and enabling school-system variables.

Parent/Caretaker Variables.

Predisposing variables. See Table 12. Parent/caretaker coping met the threshold for further inclusion, $F(2, 49,980) = 5.00, p = .01$, while the parent/caretaker stress did not, $F(1, 49,983) = 0.20, p = .66$, and was not used in further analyses. The parent/caretaker coping variable had similar associations with mental health services utilization in the first and second samples. Children who had a parent/caretaker coping either somewhat well or not very well, when compared to children who had a parent/caretaker coping very well, were less likely to utilize mental health services, although in second sample the association between parent/caretaker coping somewhat well and mental health services utilization was stronger than in the first sample.

Enabling variable. Parent/caretaker support met the threshold in sample two, $F(1, 49,966) = 7.66, p = .01$. Similar to children in the first sample, children with a parent/caretaker who reported having emotional support were over one and a half times more likely to utilize needed mental health services compared to children who had a parent/caretaker without emotional support.

Table 12. Simple logistic regressions of parent/caretaker variables and mental health services utilization ($n = 3,812$)

Variable	OR	95% CI	p-value
<u>Predisposing</u>			
Caretaker Coping			
Somewhat well	0.657	[0.45, 0.95]	0.025
Not very well	0.352	[0.17, 0.72]	0.004
Caretaker Stress	1.095	[0.74, 1.63]	0.450
<u>Enabling</u>			
Caretaker Support	1.690	[1.17, 2.45]	0.006

Note. OR = odds ratio; CI = confidence interval; p-value threshold < .20.

^aReference group = caretaker coping very well; ^bReference group = caretaker rarely/never feels stress from parenting; ^cReference group = caretaker has no emotional support.

School-system enabling variables. Both school-system variables, repeating a grade in school, $F(1, 49,922) = 5.70$, $p = 0.017$, and receipt of special education services, $F(2, 50,000) = 3.28$, $p = 0.038$, met the inclusion threshold for hypothesis-testing analyses, similar to the larger sample (Table 13). Those who repeated a grade in school were half as likely to utilize needed mental health services as children who had not repeated a grade. And those who were currently receiving special education services were one and a half times more likely to use needed mental health services than children who were never in special education services. Children who had ever, but not currently, received special education were also more likely to use mental health services, than children who had never received special education services.

Table 13. Simple logistic regressions of medical-system variables and mental health services utilization ($n = 3,812$)

Variable	OR	95% CI	p-value
<u>Enabling</u>			
Repeated a grade	0.524	[0.31, 0.89]	0.017
Special Education			
Ever, but not current	1.438	[0.90, 2.29]	0.126
Currently receives	1.608	[1.09, 2.38]	0.018

Note. OR = odds ratio; CI = confidence interval; p-value threshold < .20.

^aReference group = did not repeat a grade; ^bReference group = never received special education services.

Hypothesis Testing

Hypothesis 1: Among children with mental health needs, those who experience adversity (have experienced one or more ACEs) will have higher mental health services utilization rates compared to children who have not experienced adversity.

Hypothesis one was tested on the sample of children in need of mental health treatment or counseling in the past year, regardless of whether or not they had experienced adversity. This hypothesis was tested using two different statistical approaches. The first approach included using multivariate logistic regression models to examine the relationship of the number of ACEs experienced (0, 1, 2, 3, or 4 or more) to mental health services utilization. The second was to use a latent class analysis approach (LCA) to examine the relationship of homogenous classes of children with and without ACEs to mental health services utilization. The patterns of responses to the nine ACEs indicators were first used to generate the classes of ACEs, which were then evaluated in a LCA regression model in association with mental health services utilization.

Multivariate Logistic Regression

Table 14 presents the results of the multivariate logistic regression analysis. Hypothesis one was not supported by model results. The unadjusted model shows the simple relationship between ACEs experienced and whether children received needed mental health services, while the adjusted model shows this relationship after controlling for the traditional variables. Children who did not experience adversity were the reference group and compared with the other ACEs categories. For the unadjusted model, children who experienced two or three ACEs had lower odds of receiving needed mental health services in the past year compared to those children who have not had any adverse experiences (two ACEs: $p = 0.044$; three ACEs: $p = 0.043$). Those who experienced either one and four or more ACEs were not significantly different from those

who had experienced no ACEs (one ACE: $p = 0.146$; four ACEs: $p = 0.849$) . After adjusting for the covariates, children who experienced three ACEs continued to have lower odds of receiving needed services in the past year compared to children who experienced no ACEs ($p = 0.032$) . No other groups were significantly different from those who experienced no ACEs (one ACE: $p = 0.247$; two ACEs: $p = 0.134$; four ACEs = 0.825).

Table 14. Receipt of needed mental health services in relation to experiencing adversity ($N = 5,723$)

Variable	Unadjusted ^a		Adjusted for traditional variables ^b	
	OR	95% CI	OR	95% CI
ACE count ^c				
One	1.38	[0.89, 2.12]	1.34	[0.83, 2.21]
Two	0.62	[0.39, 0.98]	0.68	[0.41, 1.13]
Three	0.60	[0.37, 0.99]	0.56	[0.33, 0.95]
Four or more	1.04	[0.67, 1.61]	1.06	[0.63, 1.80]

Note. OR = odds ratio; CI = confidence interval; ACE = adverse childhood experience.

^aAdversity count variable entered into the model; ^bAdjusted for sex, race/ethnicity, education level of the parent/caretaker, family structure, family income level, insurance type, externalizing mental health condition, perceived severity of condition. ^cACE reference group = zero ACEs.

Latent Class Analysis

Three different LCA models were tested to examine differences between homogeneous subgroups of children who have and have not experienced adversity and mental health services utilization for children in need of mental health treatment or counseling. These results of the three models are described below, starting with the LCA measurement model.

LCA Measurement Model. A series of one- to nine-class solutions were run and model fit indices were compared to identify the optimal number of distinct classes that best represented the nine adverse childhood experiences. The two-class model was the best fitting model. While the loglikelihood value continued to get larger and the AIC, BIC and n-adjusted BIC all continued to decrease as the number of classes increased, the LMRT was not statistically significant beyond the two-class model, showing that the higher-class models did not improve model-fit with each additional class. The two-class solution exhibited high entropy (77%), and the average posterior

class membership probability scores were excellent across groups (.92-.94) (Table 15). Figure 1 shows the plot of the two classes and item-response probabilities for the nine ACEs. The most prevalent class was labeled “Low ACEs” (67.90% of the sample). Participants in this class had the lowest estimated probability of endorsing each item and showed very low probabilities for endorsing seven of the ACEs (.02-.11) with slightly more moderate probabilities for economic hardship and divorce (.29, .31).

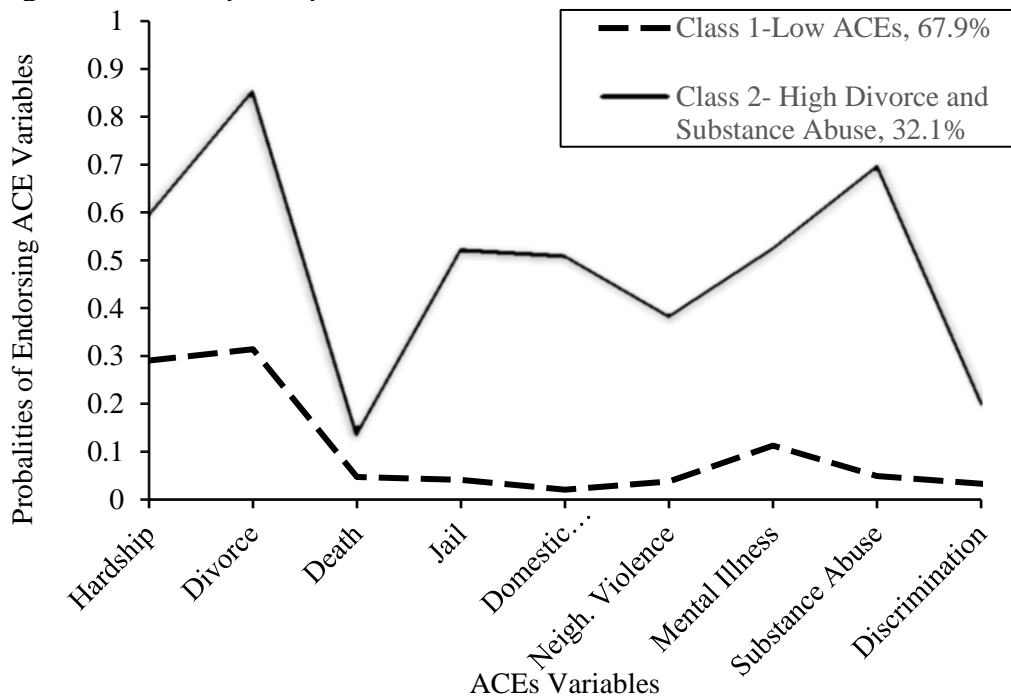
Class 2, including 32.1% of the sample, was labeled “High Divorce and Substance Abuse”. This group had a high probability of endorsing these two items (.85, .70). While higher than in class one, there was a low probability of endorsing death and discrimination (.14, .20). The remaining ACEs were moderately endorsed (.38-.59) showing these items are not good indicators of membership to this class, either by high or low endorsement (> 0.70 or < 0.30) (Masyn, 2013).

Table 15. Fit statistics for the unconditional latent class analyses for 1-4 classes

Class	No. of Free Parameters	Log-likelihood	AIC	BIC	N-adj BIC	Entropy	LMRT
1	9	-24576.103	49170.207	49230.077	49201.477	N.A.	N.A.
2	19	-218210.42	43658.843	43785.235	43724.859	0.772	5468.164***
3	29	-21579.76	43217.521	43410.436	43318.283	0.680	456.051
4	39	-21485.70	43049.49	43308.928	43184.997	0.768	185.882

Notes. N.A.= not applicable; * $p < .05$; ** $p < .01$; *** $p < .001$

Figure 1. Item-response probabilities for nine ACEs across two classes.



LCA Structural Model. The estimation of this model used the manual ML three-step approach in Mplus; the first step was to re-estimate the best fitting class measurement model (Asparouhov & Muthén, 2014). Next, associations between the traditional variables (the same variables used as covariates in the multivariate logistic regression model) and class membership were tested. This model (step 3) fit the measurement error and the most likely class membership variable calculated at step 2. In this model, race/ethnicity, education level of parent/caretaker, insurance type, externalizing condition status and the severity of any mental health condition were not associated with the two classes, while sex and family structure were significantly associated ($p < .05$) as shown in Table 16. Females had lower odds of being in the Low ACEs class compared to males. Similarly, compared to children who lived in two-parent families, children who lived in single parent, single parent with another caretaker, or non-relative caretaker families had lower odds of being in the Low ACEs class. Additionally, income, but only at 400% or greater FPL

was significantly associated with the ACEs classes. Children at this highest income level were twice as likely to be in the Low ACEs class compared to children at the lowest income level (< 99% FPL).

Table 16. Traditional variables: Comparisons of the Two Classes ($N = 5,572$)

Variable	OR	95% CI
Sex (Female) ^b	0.676	[0.47, 0.97]
Race/ethnicity ^c		
Hispanic	1.434	[0.81, 2.54]
Black, not Hispanic	1.362	[0.74, 2.52]
Other/multiracial, not Hispanic	0.595	[0.38, 1.02]
Parent/caretaker Education ^d		
High School or GED	0.788	[0.39, 1.60]
Some college	0.601	[0.31, 1.16]
College degree	0.720	[0.38, 1.38]
Family Structure ^e		
Single-parent	0.382	[0.26, 0.57]
Single-parent with another caretaker	0.323	[0.17, 0.61]
Non-relative caretaker	0.099	[0.04, 0.22]
Income Level ^f		
100-199% FPL	1.006	[0.61, 1.66]
200-399% FPL	1.628	[0.93, 2.84]
400%+ FPL	2.065	[1.12, 3.81]
Health Insurance ^g		
Public	0.623	[0.30, 1.32]
Private	2.205	[0.97, 5.02]
Both	1.843	[0.77, 4.44]
Externalizing Condition ^h		
Previous but not current	0.399	[0.16, 1.02]
Current	0.673	[0.43, 1.07]
Severity of Condition ⁱ		
Mild	1.144	[0.59, 2.23]
Moderate	1.080	[0.56, 2.07]
Severe	0.987	[0.48, 2.05]

Note. OR = odds ratio; CI = confidence interval; GED = general education diploma.

^aTraditional variables entered into the model simultaneously; ^bReference group = male; ^cReference group = White, non-Hispanic; ^dReference group = less than high school degree; ^eReference group = two-parent family; ^fReference group = 0-99% FPL; ^gReference group = uninsured; ^hReference group = never told had an externalizing condition; ⁱReference group = does not have condition.

LCA Regression Model. For the third model in the series of LCA analyses, the distal outcome, mental health services utilization, was regressed on the most likely class variable to examine the relationship of class membership to services utilization while accounting for the effects of the

covariates. The model again employed the manual three-step ML approach as already described. Sex, race/ethnicity, family structure, education level of the parent/caretaker, family income level, and externalizing condition were included in the final model as covariates. Mental health services utilization between the two classes were not significantly different based on a comparison of posterior subgroup probabilities, Wald Chi-square (1) = 2.440, $p = 0.118$. Therefore, similar to the multivariate logistic regression model, the hypothesis that children who experienced adversity would have higher rates of mental health services utilization compared to children with no ACEs was not supported using this second method.

Hypothesis 2: For children who have experienced adversity, having increased parent/caretaker vulnerability defined by: (a) Predisposing: increased parent/caretaker stress, poor parent/caretaker coping and a higher cumulative ACE score; and (b) Enabling: reduced parent/caretaker emotional support, will be negatively associated with mental health service utilization after adjusting for the traditional predictor variables.

This hypothesis was tested in the smaller subset of children with mental health needs who were reported to have at least one adverse childhood experience. Table 17 shows the results of the logistic regression model, which examined the association between parent/caretaker vulnerability factors and mental health services utilization. This hypothesis was supported in that having increased parent/caretaker vulnerability was associated with lower odds of mental health service utilization. The results of the two parent/caretaker variables are described in detail below. There were also significant differences in receipt of needed mental health services related to the number of ACEs a child experienced. Compared to children who experienced one ACE, those who experienced two ACEs ($p = 0.001$) and three ACEs ($p = 0.008$) were less likely to have received needed treatment in the past year in both the unadjusted and adjusted models (two

ACES: $p = 0.002$; three ACEs: $p = 0.037$). This association between the ACEs variable and mental health services utilization was similar to that reported under hypothesis one in the larger sample of children, which showed that children who experienced three ACEs were less likely to receive mental health services compared to those who had not experienced adversity.

Predisposing parent/caretaker variable. Children whose parent/caretaker reported not coping well had lower odds of using mental health services in the past year compared to when a parent/caretaker reported coping very well. This relationship was statistically significant in both the unadjusted model and the model adjusted for covariates (unadjusted: $p = 0.006$; adjusted: $p < 0.001$). In the adjusted model only, children whose parent/caretaker reported only coping somewhat well, again compared to coping very well, had lower odds of receiving needed mental health services in the past year ($p = 0.004$).

Enabling parent/caretaker variable. Children whose parent/caretaker reported having day-to-day emotional support had greater odds of receiving needed mental health services compared to those parents/caretakers who reported no emotional support. This relationship was statistically significant in both the unadjusted and adjusted models (unadjusted: $p = 0.013$; adjusted: $p = 0.041$).

Table 17. Parent/Caretaker Vulnerability Factors: Associations with Unadjusted and Adjusted Mental Health Services Utilization ($n = 3,812$)

Variable	Unadjusted ^a		Adjusted for traditional variables ^b	
	OR	95% CI	OR	95% CI
ACE count ^c				
Two	0.46	[0.29, 0.74]	0.47	[0.29, 0.76]
Three	0.50	[0.30, 0.83]	0.56	[0.33, 0.96]
Four or more	0.86	[0.55, 1.35]	1.01	[0.61, 1.66]
Caretaker coping ^d				
Somewhat well	0.68	[0.46, 1.00]	0.58	[0.41, 0.85]
Not well	0.38	[0.19, 0.76]	0.28	[0.14, 0.55]
Caretaker support (yes)	1.61	[1.11, 2.36]	1.49	[1.02, 2.21]

Note. OR = odds ratio; CI = confidence interval; ACE = adverse childhood experience.

^aAdversity count variable entered into the model; next, parent/caretaker variables were entered simultaneously.

^bAdjusted for sex, race/ethnicity, family structure, family income level, insurance type, perceived severity of condition. ^cACE reference group = zero ACEs; ^dReference group = caretaker coping very well.

Hypothesis 3: For children who have experienced adversity, school-system variables that are enabling, by bringing children to the attention of school professionals such as repeating a grade in school and current receipt of special education services, will be positively associated with mental health services utilization after adjusting for the traditional variables.

Enabling school-system variables. Table 18 shows the relationships between two school-system enabling variables and mental health services utilization for children who have experienced adversity. The hypothesis was partially supported. Contrary to the hypothesized relationship, children who repeated a grade had lower odds of receiving needed mental health services in the past year. This relationship was significant in both the unadjusted and adjusted model (unadjusted: $p = 0.016$; adjusted: $p = 0.014$). In support of the hypothesis, children currently in special education services were two times more likely to receive needed mental health services compared to children who never received special education services. This was the case in both the unadjusted and adjusted models (unadjusted: $p = 0.001$; adjusted: $p = 0.001$). Children who previously received special education services, but not currently were similar to

children who never received special education on mental health services utilization (unadjusted: $p = 0.142$; adjusted: $p = 0.310$).

Table 18. School System Variables: Associations with Unadjusted and Adjusted Mental Health Services Utilization ($n = 3,812$)

Variable	Unadjusted ^a		Adjusted for traditional variables ^b	
	OR	95% CI	OR	95% CI
ACE count ^c				
Two	0.45	[0.28, 0.73]	0.46	[0.28, 0.76]
Three	0.42	[0.25, 0.70]	0.42	[0.25, 0.73]
Four or more	0.79	[0.50, 1.26]	0.86	[0.51, 1.43]
Repeated a grade (yes)	0.47	[0.27, 0.81]	0.51	[0.30, 0.87]
Special Education ^d				
Ever, but not current	1.44	[0.88, 2.36]	1.33	[0.77, 2.28]
Currently receives	2.03	[1.32, 3.11]	2.22	[1.40, 3.54]

Note. OR = odds ratio; CI = confidence interval; ACE = adverse childhood experience.

^aAdversity count variable entered into the model; next, school system variables were entered simultaneously.

^bAdjusted for sex, race/ethnicity, family structure, family income level, insurance type, perceived severity of condition. ^cACE reference group = zero ACEs; ^dReference group = never received special education services.

Hypothesis 4: For children who have experienced adversity, medical-system variables that facilitate access to services (Enabling: having a personal doctor or nurse, adequate care coordination, having insurance, having adequate insurance) will be positively associated with mental health services utilization after adjusting for other traditional variables.

Enabling medical-system variables. Table 19 shows the relationship of medical-system variables to receipt of needed mental health services in the past year for children who have experienced adversity. Three medical system variables were examined, including having a personal doctor or nurse, adequate care coordination, and insurance type. Insurance type was not used as a traditional covariate in this model as in the previous models; rather it was used as a medical system variable in testing hypothesis four. This hypothesis was partially supported by the analysis, as results were not consistent across the three variables. Children who had a personal doctor or nurse, when compared to those who did not, were one and a half times more likely to have received needed mental health services in the past year in the unadjusted but not

adjusted models (unadjusted: $p = 0.047$; adjusted: $p = 0.125$) . Receiving all components of needed care coordination (versus not) was not associated with whether or not children received needed mental health services in either the unadjusted or adjusted models (unadjusted: $p = 0.131$; adjusted: $p = 0.095$). Children who had private insurance were more than twice as likely than their uninsured peers to receive needed mental health treatment in the unadjusted but not the adjusted model (unadjusted: $p = 0.036$; adjusted: $p = 0.191$) . This was the only statistically significant comparison for insurance type; comparisons between being publicly insured and uninsured (unadjusted: $p = 0.730$; adjusted: $p = 0.060$) and between having both private and public insurance and being uninsured were non-significant (unadjusted: $p = 0.105$; adjusted: $p = 0.139$).

Table 19. Medical System Variables: Associations with Unadjusted and Adjusted Mental Health Services Utilization ($n = 3,812$)

Variable	Unadjusted ^a		Adjusted for traditional variables ^b	
	OR	95% CI	OR	95% CI
ACE count ^c				
Two	0.41	[0.25, 0.67]	0.45	[0.27, 0.73]
Three	0.41	[0.25, 0.68]	0.48	[0.29, 0.82]
Four or more	0.82	[0.49, 1.35]	0.99	[0.59, 1.67]
Personal doctor or nurse (yes)	1.54	[1.00, 2.35]	1.38	[0.93, 2.05]
Care Coordination ^d				
Did not need	0.61	[0.39, 0.94]	0.63	[0.40, 0.98]
Received	1.40	[0.91, 2.16]	1.39	[0.94, 2.08]
Insurance Type ^e				
Public only	2.08	[0.93, 4.62]	2.18	[0.95, 4.99]
Private only	2.37	[1.06, 5.33]	2.03	[0.83, 4.97]
Public and private	2.23	[0.85, 5.85]	2.31	[0.81, 6.56]

Note. OR = odds ratio; CI = confidence interval; ACE = adverse childhood experience.

^aAdversity count variable entered into the model; next, medical system variables were entered simultaneously. ^bAdjusted for sex, race/ethnicity, family structure, family income level, insurance type, perceived severity of condition. ^cACE reference group = zero ACEs; ^dReference group = did not receive needed care coordination; ^eReference group = uninsured.

Hypothesis 5: For children who have experienced adversity, enabling school- and medical-system variables will moderate parent/caretaker vulnerability by reducing their negative effect on mental health services utilization after adjusting for the traditional variables.

This hypothesis was not supported. Two of the eight interaction effects tested were statistically significant, but they were not in the expected direction. The three models in Table 20 show the main effects model and the two significant interaction effects. Figures 2 and 3 also provide visual representations of these interactions. The non-significant interaction effects tested are described below in the text only.

The Main Effects Model

The main effects model tested relationships for parent/caretaker vulnerability, school-system, and medical-system variables with mental health services utilization while adjusting for the covariates. These three sets of variables were previously examined separately. The results for the main effects model were similar in some ways, but not others to those described earlier for hypotheses two through four. First, similar to earlier models, children who experienced either two ($p = 0.003$) or three ($p = 0.025$) ACEs had significantly lower odds of mental health services utilization compared to children who experienced one ACE, and the comparison between experiencing one ACE and four or more ACEs was non-significant ($p = 0.696$).

Parent/caretaker variables. The predisposing variable, parental/caretaker coping, was significantly associated with mental health services utilization. Similar to the hypothesis two model, the children of parents/caretakers coping somewhat well ($p = 0.002$) or not coping well ($p < 0.001$) were less likely to utilize mental health services than children who had parents/caretakers who were coping very well. Whether or not a parent/caretaker reported day-to-day emotional support (enabling variable) did not relate to mental health services utilization for the child ($p = 0.126$). This was different from the hypothesis two model, which showed children whose parent/caretaker reported support had greater odds of receiving needed mental health services compared to those parents/caretakers who reported no emotional support.

School-system enabling variables. Two school-system variables were tested in the main effects model, and the results were the same as the hypothesis three model. Children who were currently receiving special education services had greater odds of receiving needed mental health services than children who never received special education services ($p = 0.003$). There was no significant difference in mental health services utilization between children who previously, but not currently, received special education services and those who never received special education services ($p = 0.598$). Children who repeated a grade in school had lower odds of receiving needed mental health services compared to children who had never repeated a grade in school ($p = 0.001$).

Medical-system enabling variables. There was one statistically significant finding for the medical-system variables, in that children who did not need care coordination were half as likely to use mental health services as children who needed, but did not receive adequate care coordination ($p = 0.027$). Having a personal doctor or nurse was not associated with mental health services utilization in children ($p = 0.081$). These two findings were different from hypothesis four, which showed no significant differences for any of the care coordination categories and that children who had a personal doctor or nurse were one and a half times more likely to use mental health services in the past year. Like hypothesis four, children who received adequate care coordination and those who needed but did not receive all components of needed care coordination were not significantly different ($p = 0.448$).

Interaction effects. The first interaction model, presented in Table 20, tested the interaction between parent/caretaker coping and receiving special education services. See Figure 2. Children whose parent/caretaker reported coping not very well were significantly less likely to receive needed mental health treatment if they had previously, but not currently, received

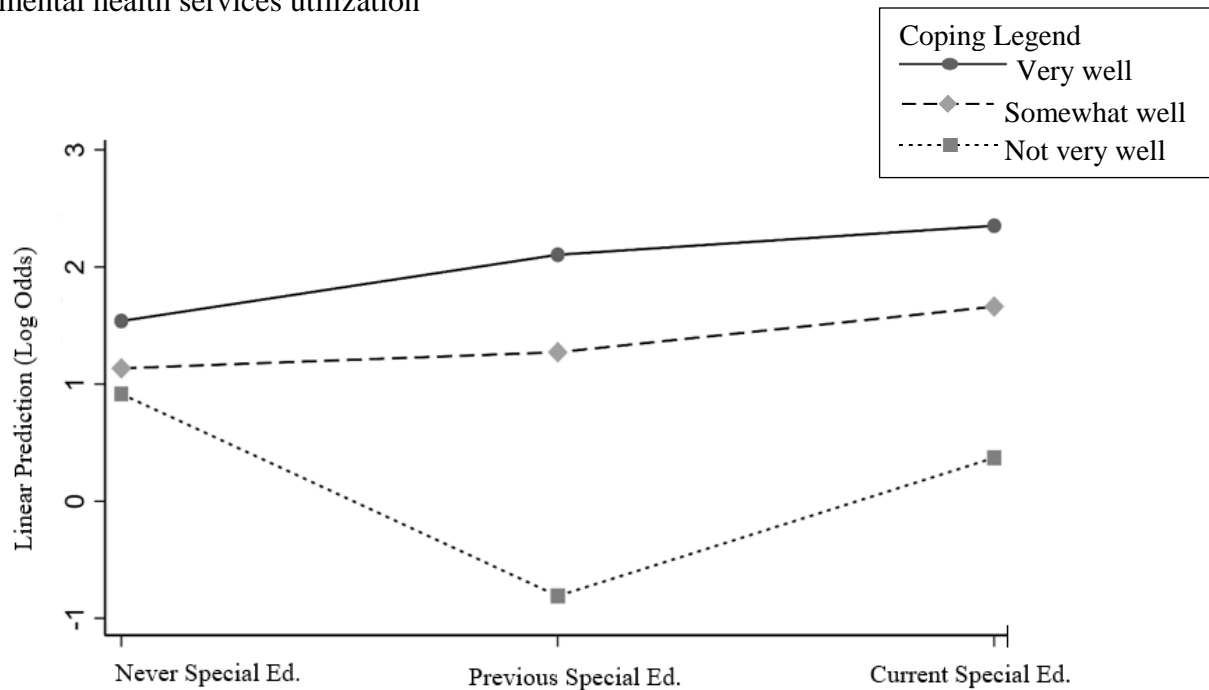
special education services when compared to parents/caretakers who reported coping very well, with children who never received special education services ($p = 0.018$). The odds of receiving needed mental health services were not different across the three special education categories when children had a parent/caretaker who was coping somewhat well (ever, but not current: $p = 0.539$; currently receives: $p = 0.797$) .

Table 20. Mental Health Services Utilization: Models Testing Interaction Effects between Parent/Caregiver Vulnerability and Systems Variables ($n = 3,812$)

	Models		
	<u>Main Effects</u>	<u>Interaction 1</u>	<u>Interaction 2</u>
	Adjusted <i>OR</i> (95% <i>CI</i>)	Adjusted <i>OR</i> (95% <i>CI</i>)	Adjusted <i>OR</i> (95% <i>CI</i>)
<u>ACE count^a</u>			
Two	0.47 (0.28, 0.77)	0.48 (0.30, 0.79)	0.50 (0.31, 0.81)
Three	0.53 (0.31, 0.93)	0.53 (0.30, 0.91)	0.56 (0.33, 0.96)
Four	1.18 (0.70, 2.01)	1.18 (0.69, 2.00)	1.24 (0.74, 2.08)
<u>Parent/caretaker vulnerability variables</u>			
<i>Predisposing</i>			
<u>Parent/caretaker Coping^b</u>			
Somewhat well	0.55 (0.38, 0.80)	0.58 (0.36, 0.93)	0.93 (0.51, 1.69)
Not very well	0.24 (0.12, 0.84)	0.46 (0.20, 1.04)	0.66 (0.27, 1.62)
<i>Enabling</i>			
Parent/caretaker Support ^c	1.35 (0.91, 1.98)	1.35, 0.92, 1.98)	1.34 (0.91, 1.95)
<u>School-system enabling variable</u>			
<u>Special Education^d</u>			
Ever, but not current	1.16 (0.67, 2.01)	1.75 (0.75, 4.06)	1.26 (0.73, 2.15)
Currently receives	1.98 (1.27, 3.09)	2.31 (1.17, 4.56)	2.05 (1.31, 3.19)
Repeated a grade (yes)	0.40 (0.23, 0.67)	0.40 (0.24, 0.67)	0.40 (0.24, 0.67)
<u>Medical-system enabling variables</u>			
<u>Care Coordination^f</u>			
Did not need	0.58 (0.36, 0.94)	0.60 (0.37, 0.96)	1.26 (0.55, 2.85)
Received	1.18 (0.77, 1.82)	1.23 (0.80, 1.88)	1.83 (0.96, 3.51)
Personal Doctor or Nurse ^e	1.43 (0.95, 2.15)	1.40 (0.93, 2.11)	1.47 (0.98, 2.21)
<u>Coping*Special Education</u>			
Somewhat well*Ever received		0.71 (0.23, 2.14)	
Not very well*Ever received		0.11 (0.02, 0.67)	
Somewhat well*Current		0.89 (0.38, 2.11)	
Not very well*Current		0.32 (0.85, 1.23)	
<u>Coping*Care Coordination</u>			
Somewhat well*Did not need			0.33 (0.12, 0.88)
Not very well*Did not need			0.22 (0.05, 0.97)
Somewhat well*Received			0.64 (0.27, 1.50)
Not very well*Received			0.10 (0.02, 0.55)

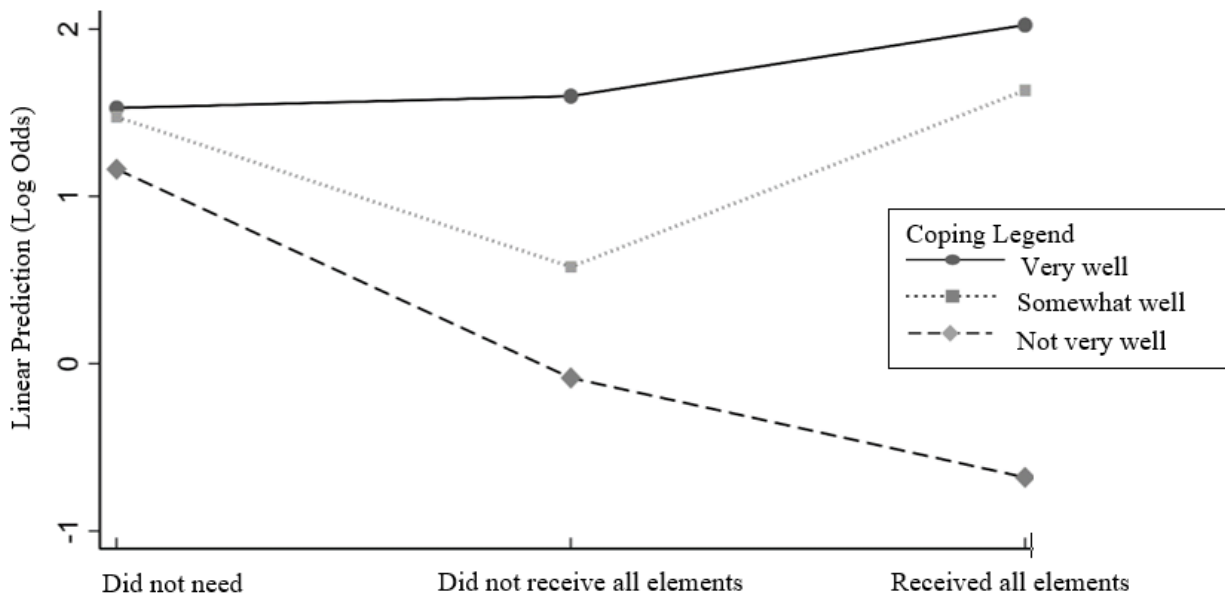
Note. *OR* = odds ratio; *CI* = confidence interval; ACE = adverse childhood experience. ^aReference group = one; ^bReference group = coping very well; ^cReference group = has emotional support; ^dReference group = has never received special education services; ^eReference group = had a personal doctor or nurse; ^fReference group = did not receive care coordination.

Figure 2. Interaction effects of parent/caretaker coping and special education in predicting mental health services utilization



The second interaction model tested the interaction between parent/caretaker coping and care coordination. Two interaction effects were statistically significant, but again they were not in the expected direction. For parents/caretakers coping somewhat well, children who did not need care coordination were less likely to receive needed mental health services in the past year than parents/caretakers coping very well with children who did not receive all needed components of care coordination ($p = 0.027$). For parents/caretakers who were not coping well, their children were less likely to receive needed services even if they received all needed components of care coordination compared, again, to parents/caretakers coping very well with children who did not receive all needed components of care coordination ($p = 0.008$).

Figure 3. Interaction effects of parent/caretaker coping and care coordination in predicting mental health services utilization



The remaining interaction effects were not statistically significant when added to the main effects model. (1) The interaction between caretaker support and receipt of special education services: Neither having received special education services in the past, but not currently ($OR = 1.04$, 95% $CI = 0.35, 3.09$, $p = 0.938$) nor currently receiving special education services ($OR = 2.11$; 95% $CI = 0.93, 4.80$, $p = 0.073$) moderated the relationship of caretaker support on receiving mental health services. (2) The interaction between parent/caretaker coping and having a personal doctor or nurse: Having a personal doctor or nurse did not moderate the effect of either having a parent/caretaker coping somewhat well ($OR = 1.62$; 95% $CI = 0.68, 3.88$, $p = 2.279$) or coping not very well ($OR = 1.74$; 95% $CI = 0.44, 6.89$, $p = 0.423$) (versus coping very well) on mental health services utilization. (3) Interaction between parent/caretaker emotional support and having a personal doctor or nurse: Having a personal doctor or nurse did not significantly moderate the effect of parent/caretaker emotional support on a child receiving mental health services ($OR = 1.11$; 95% $CI = 0.48, 2.56$, $p = 0.808$). (4) The interaction

between parent/caretaker support and care coordination: Neither not needing care coordination ($OR = 0.65$; 95% $CI = 0.26, 1.65$, $p = 0.363$) nor receiving all needed components of care coordination ($OR = 0.72$, 95% $CI = 0.29, 1.81$, $p = 0.490$) moderated the effect of parent/caretaker emotional support on use of mental health services. (5) The interaction of parent/caretaker support and repeating a grade in school: Repeating a grade in school did not moderate the effect of parent/caretaker support on mental health services utilization ($OR = 1.61$, 95% $CI = 0.57, 4.57$, $p = 0.368$). (6) Finally, the interaction between parent/caretaker coping and repeating a grade in school: Repeating a grade in school neither moderated the effect of coping somewhat well ($OR = 1.07$, 95% $CI = 0.34, 1.80$, $p = 0.080$) nor not coping very well ($OR = 0.92$, 95% $CI = 0.17, 5.14$, $p = 0.929$) on mental health services utilization.

CHAPTER 5

Key Findings

The current study examined mental health services utilization among children in the general U.S. population, ages 6-17 years, whose parent/caretaker identified as having a mental health condition that required treatment or counseling. The study had three aims. They were to (1) test the relationships between mental health services utilization and adverse childhood experiences (ACEs); (2) evaluate parent/caretaker vulnerability variables as barriers to mental health services utilization for children who have experienced adversity; and (3) assess medical- and school-system variables as facilitators of mental health services utilization for children who have experienced adversity. The study also assessed the potential buffering effect against parent/caretaker vulnerability by medical- and school-system variables for children's mental health services utilization.

Adverse Childhood Experiences and Mental Health Services Utilization

In this study, children who experienced adversity were as likely to use needed mental health services as their peers who did not experience childhood adversity. It was hypothesized that children who experienced one or more ACEs would have *higher* mental health services utilization than children with no ACEs, but this was not supported. The relationship between ACEs and mental health services utilization was examined in two ways; however, the findings were consistent. When examining a cumulative ACEs score, children who experienced zero, one, two and four or more ACEs were not significantly different on whether they utilized mental health services, but those children experiencing three ACEs were significantly different from those experiencing no ACEs in that they were *less likely* to utilize mental health services. A separate analysis looked at homogeneous subgroups of children in need of mental health

treatment based on the types of ACEs they experienced. There was no difference in treatment services utilization when comparing a low ACEs class and a high divorce and parental substance abuse class, which while contrary to the hypothesis, is similar to the results using the cumulative ACEs variable. In summary, these results showed that children who experienced increased levels of adversity were not utilizing services at a higher rate than those with lower levels of or no adverse experiences.

This finding was surprising because both prior studies and preliminary analyses for the current study showed that children who experience adversity tend to exhibit externalizing behaviors and have more severe mental health conditions, which suggest that these children have a greater need for treatment. Although it is also the case that children with these mental health characteristics experience greater unmet need and are more likely to drop out of services early (Cornelius et al., 2001; de Haan et al., 2013; Ganz & Tendulkar, 2006; Johnson et al., 2008; Merikangas et al., 2010; Morrissey-Kane & Prinz, 1999). Therefore, not only are these children not receiving services at a higher rate than children without ACEs, but they may also be exhibiting a higher level of unmet need, though this study did not look at this specifically.

It may also be the case that these children received services at some point in time but stopped engaging in services prior to the previous twelve months. For the current study, parents/caretakers reported whether the child ever had a mental health condition, while services utilization was reported for the past year. As such, another possible reason this hypothesis was not supported is that the parent/caretaker's reporting of the child's mental health need and use of services were subject to a social desirability bias. It stands out that most children in this U.S. population sample who reportedly needed mental health treatment or counseling received it. This is contradictory to most studies that show children who need mental health services do not

get them (Centers for Disease Control and Prevention, 2013; Costello et al., 2014). It may be that parents/caretakers reported the child received treatment or counseling as the more socially acceptable answer or that parents/caretakers were reluctant to report that the child had a mental health need if it was not already being addressed.

The difference between the current study and these other studies could also be explained by the measures of treatment need and treatment utilization used. For example, in Costello, Erkanli, Fairbank, and Angold (2014), adolescents were administered a reliable and valid diagnostic interview to measure mental health need and then were asked if they received treatment for the diagnosed condition in the past twelve months. Contrary to the current study, this measurement approach did not limit the identification of youth who needed services to those who were previously identified by a doctor or other healthcare provider or sought treatment or to the parent/caretaker's perception of those events. Also, in contrast to the current study, Costello, et al. (2014) assessed services utilization in all children with a mental health diagnosis whether or not they were previously identified as needing treatment.

Additionally, some parents/caretakers might not be aware that mental health problems occur in children, which could also result in some children not being included in the analysis. It is possible that some parents/caretakers overlooked their child's mental health problems or did not think they were serious enough to warrant treatment. A study conducted by van Vulpen, Habegar, and Simmons (2018) found that of 607 parents or guardians surveyed by the Eastern Shore Coalition of Maryland, 61% reported a lack of awareness that mental health problems even occur in children and adolescents. Seventeen percent of rural and urban African American parents/caretakers ($n = 175$) from one southern state, whose child had at least one outpatient

mental health appointment in the past six months, reported they did not believe their child's problem was serious, which was a barrier to continued treatment (Mukolo & Heflinger, 2011).

Another limitation to the dataset used for this study could be the type of ACEs that were available. Parents/caretakers were *not asked* whether their child experienced child abuse or neglect, which could mean the ACEs most associated with mental health services utilization were not included in the analysis. Child abuse and neglect are strong indicators of poor outcomes in children (Chartier, Walker, & Naimark, 2010; Finkelhor et al., 2007), and prior studies support that children whose families are involved in the child welfare system are more likely to receive services or referrals for services (Farmer et al., 2010; Horwitz et al., 2012). In fact, much of the Systems of Care literature that shows an increased utilization of mental health services for children included children who have been abused and/or neglected and involved in the child welfare system (Farmer et al., 2010). Alternatively, for the current study, parental divorce/separation and financial hardship were the two most common ACEs endorsed. Some researchers argue that parent separation/divorce no longer contributes to child distress in the same way it did at the time of the original ACE study, because of changes in social behaviors and social norms (Finkelhor et al., 2013). Further, lower socio-economic status, while different yet related to financial hardship, has been associated with decreased service utilization (Gyamfi, 2004). Therefore, it could be that the expected positive relationship between ACEs and treatment utilization does not generalize to this general population sample based on the ACEs measured.

Like prior studies, the children in the current study who experienced adversity were overrepresented in other vulnerable groups that have reduced access to needed mental health services; this could be another reason why children who experienced ACEs underutilized

services. Black children, for example, are more likely to experience adversity and also less likely to utilize services (Horwitz et al., 2012; Kazdin et al., 1997; Mayberry & Heflinger, 2011). Similarly, children from lower income families experience more ACEs and use less mental health services (Ganz & Tendulkar, 2006; Rosen-Reynoso et al., 2016).

Multiple factors related to race/ethnicity and socioeconomic status influence utilization for children. The historic socioeconomic inequality experienced by Black families, the cultural experiences of groups, and their help-seeking behaviors affect services utilization (Harrison et al., 2004; Whaley, 2001). Some racial/ethnic minority populations, for example, are less trusting of institutions and tend to rely on family and community in times of need (Harrison et al., 2004). Whaley (2001) in his meta-analysis of 22 studies in African-Americans, which included studies on both children and adults, found that cultural mistrust played a significant role in problems with psychological functioning and the underutilization of mental health treatment services for all age groups. Cultural mistrust can be defined as the beliefs and attitudes held by African Americans about White society based on historical and continued oppression (Terrell, Terrell, & Taylor, 1981).

Racial/ethnic bias can exist at multiple levels of service provision from practitioner, to program or organization, and extending into the community which can also influence mental health services utilization for some racial/ethnic minority populations. Differing beliefs, attitudes, and behaviors can be viewed as mental health or behavioral problems rather than cultural differences. This is evident in diagnostic practices that result in misdiagnosis, underrepresentation in outpatient services and overrepresentation among involuntary hospitalizations of certain minority groups, particularly African Americans (Whaley, 2001). African Americans who do seek treatment for their children are more likely to drop out, which

could be attributable to these biases in the therapeutic relationship or program according to a meta-analysis review of studies on mental health treatment dropout among racial and ethnic minority youth (de Haan, Boon, de Jong, & Vermeiren, 2018). Whether a child lives in a rural or urban areas also impacts utilization, and rural areas tend to have greater concentrations of lower-income and African American populations (Burns et al., 2003; Mukolo & Heflinger, 2011).

Parent/Caretaker Variables and Services Utilization

Parent/caretaker vulnerability variables were studied in the subsample of children who experienced adversity. The current study findings supported hypothesis two, in that poor parent/caretaker coping and reduced parent/caretaker emotional support were both associated with lower odds that children received needed mental health services. This affirms findings from previous research that factors related to negative family functioning decrease the likelihood that youth receive needed mental health treatment (Burnett-Zeigler & Lyons, 2010; de Haan et al., 2013; Kazdin et al., 1997; Kutash et al., 2012; Mayberry & Heflinger, 2011; Morrissey-Kane & Prinz, 1999; Salloum et al., 2016). This may be due to the increased burden parents feel when they are not coping well and do not have the emotional support needed to improve functioning. These increased burdens act as barriers to getting their child into mental health services. This is especially significant for this population of children who had experienced adversity as they have increased needs that will likely, in turn, result in greater unmet need for this group of vulnerable children.

These findings were different from previous findings in one key way. When a parent/caretaker had emotional support it acted as a facilitator to using services in this study; other studies examining emotional support showed different findings (Brannan et al., 2003; Bussing et al., 2003; Harrison et al., 2004). More specifically, this study measured emotional

support as having someone to turn to for emotional help with parenting or raising children. This is most similar to a parent/caretaker having someone to rely on when they have concerns about parenting, which Brannan, Heflinger, and Foster's study (2003) showed was associated with decreased utilization in children. These differences could be explained by the specific populations previously studied and their relative needs (e.g., children who were diagnosed with ADHD, youth who lived in urban areas) versus the current population-based study of children who have experienced ACEs. Children who experience adversity are a high-needs group, and the emotional support parents/caretakers receive may facilitate their ability to get the child to services. In contrast, other groups may have lower needs and so support for these parents/caretakers may facilitate them feeling more able to parent the child without additional services.

Systems Variables and Mental Health Services Utilization

School System Variables. School system variables and their relationship to services utilization were also examined in the subsample of children who experienced adversity. However, hypothesis three was only partially supported; while currently receiving special education facilitated services utilization, previously receiving special education and repeating a grade in school were not associated with utilization. Children who currently received special education services were twice as likely as children who did not to utilize needed mental health services. This finding is important and supports the mechanisms put forth by Systems of Care, in that systems can act as an enabler for children to receive the services they need. In particular, this shows that when needs are identified within the school system through special education, school personnel can facilitate services use for those children (Burns et al., 1995; Farmer et al., 2003). Unfortunately, children who only previously received special education were less likely to utilize

services. It could be that the comprehensive testing and assessments received by children currently in special education enable access to services and children no longer in special education are not receiving that same level of attention. Therefore, there are gaps in assisting children who previously came to the attention of school personnel. Stephan, Sugai, Lever, and Connors (2015) showed that special education services that intervene on mental health problems are activated when those problems severely influence educational performance. If children are not experiencing a severe educational need, they are unlikely to receive mental health services through the formal special education process.

A second way that children could come to the attention of school professionals, by repeating a grade in school, also did not facilitate services for children in this sample. This event instead resulted in children being less likely to receive needed mental health services. While the current study appears to be the first to examine the relationship between repeating a grade and children's mental health services utilization, Mundy et al. (2017) showed that grade repetition is associated with a higher need for treatment as determined by a standardized instrument that measured emotional symptoms, conduct problems, hyperactivity/inattention, and peer relationship problems. It may be that repeating a grade does not correlate with being in contact with school system professionals who identify and broker mental health services for children. Additionally, teachers and other school personnel could need more training in how to identify and intervene with students' mental health needs (Moon et al., 2017). Repeating a grade, in and of itself, may not alert them to consider a student's needs outside those related to academics. Alternately, this finding may indicate a limitation of the variable in the dataset (ever repeated). It is possible that the child repeated a grade at an earlier point in their school career, which was not associated with utilization in the past 12 months.

It was also a study limitation that the dataset did not include a measure of chronic school absenteeism, which is an additional means by which youth in a school system could be identified as needing mental health services. Chronic absenteeism is defined as missing more than fifteen days of school within a school year (Egger et al., 2003) and is associated with childhood adversity (Stempel et al., 2017) and also with increased mental health needs (Egger et al., 2003; Stempel et al., 2017). Having an accurate measure of chronic school absenteeism could be helpful in determining if this indicator is an effective mechanism for identifying and facilitating mental health services use for children. For example, Askeland, Haugland, Stormark, Bøe, and Hysing (2015) found youth with high absence (15% or more in the past semester) were more likely to be in contact with mental health services than their peers with low absences (less than 3% in the past semester) in their Norwegian population study. However, no studies were identified that examined this relationship between chronic absenteeism and mental health services utilization in a U.S. study sample.

Medical System Variables. For children who experienced adversity, it was expected that medical system variables would increase mental health services utilization. This hypothesis (four) was not supported. In the model unadjusted for covariates, having a personal doctor/nurse and having private insurance were each associated with increased odds of mental health services utilization, but were no longer associated once traditional variables were included in the model. The only statistically significant finding was that children who did not need care coordination received less mental health services than children who needed but did not receive all components of care coordination. While this finding is relatively minor, it does indicate that receiving some coordination can facilitate services utilization. However, generally, these findings were surprising given that previous research supports the utility of medical-systems variables in

enabling service utilization for children with mental health needs (Busch & Horwitz, 2004; Cabana & Jee, 2004; Farmer et al., 2010; Ganz & Tendulkar, 2006; Homer et al., 2008).

That insurance type was not associated with mental health services utilization was unexpected. Not having insurance has consistently been shown to reduce service utilization in children and to increase their unmet mental health needs (Busch & Horwitz, 2004; Farmer et al., 2010; Ganz & Tendulkar, 2006; Kataoka et al., 2002; Kreider et al., 2016). Both the populations studied and the outcomes measured may be factors that explain the difference between the current study and these other studies. For example, the prior studies reviewed used data from families with low to moderate incomes (Busch & Horwitz, 2004; Kreider et al., 2016), young children (Kataoka et al., 2002), children involved in the child welfare system (Farmer et al., 2010), and children with special health care needs (Ganz & Tendulkar, 2006). Each of these studies showed that these populations are associated with having more unmet mental health need, while the current study examined services utilization. As stated previously, while unmet need and services utilization are related, they are different outcomes in that a person may receive services that do not fully meet their mental health needs.

System-Level Factors as Potential Buffering Effects

The current study examined school- and medical-system factors to evaluate whether they lessened the negative effects of parent/caretaker factors on mental health services utilization in the subsample of children who experienced adversity. These systems factors did not buffer the association between parent/caretaker vulnerability variables and reduced mental health services utilization; hypothesis five was not supported. Only three interactions were significantly associated with mental health services utilization and these were in an unexpected direction. First, when a child had a parent/caretaker who was not coping very well, having previously, but

not currently received special education services significantly *decreased* the likelihood of services utilization. Therefore, children who previously received special education services may be especially likely to fall through the cracks of getting needed mental health services when their parent/caretaker is not doing well with the demands of raising a child. Currently receiving special education services also did not buffer the effects of having a parent/caretaker who was not coping very well, which was a concerning finding given that these children have the attention of school professionals and the current receipt of special education services facilitated services utilization in the main effects model. This suggests that a child's involvement in special education services is not enough to mitigate the effects of negative parent/caretaker functioning in breaking down the barriers that keep a child from accessing needed mental health services.

The second and third unexpected interaction effects involved parent/caretaker coping and care coordination (a medical systems variable) with the findings being similar to those for special education. Specifically, children who had a parent/caretaker who was not coping very well utilized mental health services *less* when they received all needed components of care coordination. It may be that these parents/caretakers are so overwhelmed that even when the involved professionals are communicating with one another, i.e., coordinated, it is not sufficient to get the child to services. For those coping somewhat well, not needing care coordination *reduced* their odds of utilizing mental health services. This finding may be logical in that this combination could indicate these children have a reduced need for services, but, regardless, it did not support the proposed hypothesis.

In summary, these findings indicate in the current sample of children with ACEs that school- and medical-system services did not reduce the barriers to services use associated with negative family functioning. This could be because these systems are not specifically designed

to identify and provide the resources needed to assist children in receiving mental health services. While there is an increased focus on using school and medical systems for early detection of children with mental health problems (American Academy of Pediatrics, 2019; Stephan et al., 2015), the infrastructure to systematically use these systems in this manner may not be realized.

Alternatively, systems other than school and medical may have a more direct influence on mental health services utilization for children who experience adversity. However, the study dataset was also limited in the types of systems that could be examined. The dataset did not include variables related to the child welfare system, which influences services utilization in other studies (Farmer et al., 2010; Horwitz et al., 2012). There were also no variables related to juvenile justice system involvement, which is one of the systems included a Systems of Care. However, it is important to note that the juvenile justice system has not been shown to act as a facilitator of services for youth in need of mental health treatment (Hazen, Hough, Landsverk, & Wood, 2004; Rogers et al., 2001).

It was also not possible to comprehensively assess a Systems of Care approach using the current dataset. Instead systems were assessed individually rather than incorporating the full Systems of Care model that focuses on wrap around services with the child and family at the center of decision-making (Brashears et al., 2012; Miller et al., 2012). Thus, only medical and school system variables were used as proxies for a Systems of Care approach to providing access to mental health services.

Strengths and Limitations

Strengths

The use of the National Survey for Children's Health was a strength of this study. It is a large dataset and provided an adequately powered analysis of the study hypotheses both in the sample of children identified as in need of mental health services and the smaller subset of participants who experienced adversity. It is also a robust dataset with numerous variables available to operationalize the Gelberg-Andersen model. This dataset allowed for examination of both traditional and vulnerability domains and of the predisposing, enabling and need variables that influence children's access to mental health treatment or counseling. This dataset was weighted to be representative of the U.S. population of non-institutionalized children and results are generalizable to this population. The use of two different data analysis approaches to assess the relationship between ACEs and services utilization was also a strength of this study. Replicating the finding that ACEs were not associated with increased mental health services utilization using both an ACEs count measure and a latent class analysis showed that this finding generalized across data analysis methods.

Limitations

These strengths are weighed against several study limitations. One limitation is related to the sample of this dataset. The 2016 National Survey for Children's Health surveyed a population of non-institutionalized children who have a parent or caretaker able to answer questions about them. The approach excludes children who are institutionalized or do not live in a home for some other reason, such as homelessness. This would include children in juvenile detention or in residential settings because of serious emotional or behavioral disturbances and other children who are at very high risk for mental health problems. This group may be

important when studying ACEs and mental health services utilization due to their increased likelihood of both experiencing adversity and their higher risk for needing mental health services (Rapp, 2016; Zajac, Sheidow, & Davis, 2015).

There are additional limitations related to item measurement. First, the measurement of ACEs used had some disadvantages. The original ACEs questionnaire was constructed with nine items in two groups: maltreatment and family dysfunction (Felitti et al., 1998). Subsequent studies using this tool have established the deleterious effects of ACEs on individuals (Farmer et al., 2010; Felitti et al., 1998; Finkelhor, Shattuck, Turner, & Hamby, 2015). The survey used in the present study did not include one of the two ACEs groups (i.e., child maltreatment), a choice made to decrease the possibility of reporting bias by the parent/caretaker. However, not including the child maltreatment items has obvious disadvantages, as maltreatment represents a significant and potentially impairing category of ACEs that may be associated with increased mental health services utilization. In addition to not including maltreatment, the instrument included ACEs that were not part of the original item set; specifically, the instrument included financial hardship and racial discrimination. Deviating from the original item set may mean leaving behind the psychometric foundation of the original instrument. Other studies include these additional ACE items with the justification that they strengthen cross-cultural validity as some adversities are unequally distributed among groups (Mersky, Janczewski, & Topitzer, 2017). Finally, the instrument only captured a binary response for each category of ACE, that is, the presence or absence of the ACE for the child in question. Missing in this questioning is information about the quantity, duration and intensity of these experiences, characteristics that some researchers suggest influence the impact of ACEs on later functioning (McLaughlin & Sheridan, 2016; McLaughlin, Sheridan, & Lambert, 2014). Unfortunately, the field has yet to

reach consensus on what experiences should be defined as an ACE or a single tool to measure ACEs (Mersky, Janczewski, & Topitzes, 2017).

A second instrumentation limitation in the current study was related to the dependent variable: mental health services utilization. The method for gathering this critical data point was to ask if the child: (a) received needed treatment or counseling; (b) needed but did not receive treatment or counseling; or (c) did not need treatment or counseling. It is possible that asking specifically about treatment or counseling only does not capture the more informal ways in which children receive help for their mental health needs, such as through a school guidance counselor, behavior support specialist or mentor. This is important as many children receive mental health services by these non-traditional means, particularly in school settings (Burns et al., 1995; Farmer, Burns, Phillips, Angold, & Costello, 2003). Therefore, asking about services use in this limited way may have affected study results about the school system. Additionally, this questioning does not capture the frequency, duration, intensity or quality of services received, which all have been shown to affect child mental health outcomes (Becker et al., 2013; de Haan, Boon, de Jong, Hoeve, & Vermeiren, 2013).

Relatedly, children were included in the current study sample if their parent/caretaker reported that they were identified by a mental health professional as having a mental or behavioral condition for which they needed treatment or counseling. A mental health professional was defined as psychiatrist, psychologist, psychiatric nurse, and clinical social worker. This list leaves out other professionals, such as physicians and licensed professional counselors who may also identify children as having a mental or behavioral disorder. In turn, some children could have been excluded from the sample that actually were identified by other professionals as having a condition that requires additional services. This could especially affect

the medical system results if children identified through this system were excluded from the study sample.

Using parent/caretaker report as the only source of information is another limitation of this study. ACEs themselves are sensitive topics and there are many reasons why a parent/caretaker may be less than forthcoming with such information. Whereas some studies show parents to be reliable reporters of such incidents, others show they underreport adverse experiences (Kerker, Horwitz, Leventhal, Plichta, & Leaf, 2000; Lanyon, Dannenbaum, & Brown, 1991; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). Most research with children and adolescents emphasizes the need for multiple reporters, which may be other caretakers, the child, or another professional who knows the child well (Block et al., 2017). Future research on the topic should include multiple reporters on the main constructs, including the ACE items and mental health services utilization. Using the child as a reporter could also help assess the child's understanding or awareness of ACE events occurring in the household such as substance abuse or domestic violence.

Finally, the data used for this study were cross-sectional, which does not allow for causal inferences. Given the primary focus of the present study, the cross-sectional design represents an important limitation to consider when integrating the findings into the literature. For example, there are alternative explanations for the findings that cannot be ruled out. Parent/caretaker vulnerability was associated with decreased mental health services utilization, and it may be that this relationship is bi-directional. Parent/caretaker factors may act as barriers to getting a child to services, but also the child's untreated behavioral or mental health condition may affect parent/caretaker functioning. Similarly, children in special education may receive services

because special education acts as a facilitator, or it may be that children already in mental health services are more likely to access to special education.

Recommendations for Future Research

This study identifies several important topics for further research. First, it points to the need for increased standardization of childhood adversity measures. There are advantages to using the original ACEs items, which include maltreatment and family dysfunction. The original ACEs tool is widely used, has good reliability and validity and consistently provides evidence of the negative effects of ACEs across the lifespan (Anda et al., 2006; Felitti et al., 1998). There also may be benefits to including additional ACE items; however, there needs to be greater consensus from the research community. The field of ACEs research would be strengthened by the development and consistent implementation of a tool that has good validity and reliability across groups. Otherwise, there are complications for using different items to measure ACEs; it changes the demographics of those who experience adversity (e.g., by adding poverty) and the meaning of the ACE score, which make it difficult to compare the results from different ACEs studies. Providing consistency in ACEs measurement can then allow for a better understanding of ACEs influence on child outcomes including mental health services utilization.

Future research that uses data collection methods beyond parent/caretaker report will also be important. Using other methods to corroborate parent/caretaker reports, such as through multiple informants, professional reports, or using standardized measurements could strengthen data reliability and validity (DeVellis, 2012; DeVoe & Kantor, 2002). However, a strength of the current study was its large sample size, and incorporating other methods to corroborate parent/caretaker reports may not be practical in terms of time and resources for a large, nationally representative study. However, finding a balance between this strength and the

difficulties inherent in using multiple methods in a large-scale study would strengthen future findings on the relationship between ACEs and services utilization.

Broadening the definition of mental health services is another consideration for future research on ACEs and services utilization. It is important to measure the use of treatment or counseling. However, many children receive mental health services in less traditional ways. They may include mentoring, receiving care by a behavioral specialist or through a guidance counselor at school (Burns et al., 1995; Farmer et al., 2003). This broader definition of services may improve the measurement of services utilization for all children who experience ACEs in that a focus on specialty mental health services may not accurately account for utilization by children who are economically disadvantaged. Children who receive mental health services in more traditional ways tend to be more economically advantaged (Burnett-Zeigler & Lyons, 2010; Ganz & Tendulkar, 2006), while disadvantaged children have increased ACEs and mental health need (Halfon, Larson, Son, Lu, & Bethell, 2017; Marryat & Frank, 2019; Metzler, Merrick, Klevens, Ports, & Ford, 2017). Therefore, excluding other means to receive mental health services could underestimate services utilization by children with a higher risk of experiencing ACEs and provide an incomplete picture of mental health services utilization for children who have experienced adversity. Similarly, broadening the definition of a mental health professional may improve the identification and sample selection of children with a need for mental health services. This may be especially relevant for medical professionals given their increasing role in the identification and treatment of children with mental health needs (American Academy of Pediatrics, 2009).

Fully assessing how children with ACEs are identified and referred to services through a Systems of Care approach is also an important next step for future research. While this approach

involves the mental health, health care, child welfare, education and juvenile justice systems, studies on the relationship between mental health services utilization and children who experience adversity are mostly limited to children involved in the child welfare system (Farmer et al., 2003). Examining the full spectrum of systems in which children are involved will improve understanding for mental health services use for all children and not just those who have been identified as alleged victims of abuse or neglect. The present study was only able to examine special education and repeating a grade in school as proxies for the school system. Other school-system factors could influence the identification of children in need such as chronic absenteeism (Askeland, Haugland, Stormark, Bøe, & Hysing, 2015; Egger, Costello, & Angold, 2003; Stempel, Cox-Martin, Bronsert, Dickinson, & Allison, 2017). For children who have experienced adversity, special education services can facilitate access (George, Zaheer, Kern, & Evans, 2018; Pandiani, Banks, Simon, Van Vleck, & Pomeroy, 2005). However, studies are needed to understand how children gain access to mental health services outside of special education. Medical-system factors could also be expanded beyond those used for the current study. Care coordination, having a personal doctor or nurse and insurance type may not have accurately or completely assessed the medical system as a facilitator of mental health services. These variables did not account for the physician's ability, or lack thereof, to identify children who have experienced adversity and who have mental health needs. This is important as physician identification of children with mental health needs has been raised as a concern, and the first step to receiving needed services is identifying the need (American Academy of Pediatrics, 2019). If physicians do not have the training to identify children with mental health needs, these children may not be accounted for in the study sample or receive the services that they need.

Implications for Social Work Policy, Practice and Education

This study also offers a number of implications for social work policy, practice and education. Social workers work through a social justice lens and advocate for the most vulnerable in society (National Association of Social Workers, 2017). This study identified children who have experienced adversity as a vulnerable group in the general population given that their increased mental health needs did not correspond with an increased utilization of mental health services. Social workers need to advocate for policies and implement practices that identify children with ACEs early and assist them in gaining access to services to improve outcomes. This effort will be most effective if done in conjunction with parents/caretakers and with other child-helping systems.

The Grand Challenges for Social Work call for universal preventive interventions to raise awareness of the mental and behavioral-health needs of children (Hawkins et al., 2016). This and previous research support the need for increased community education to raise awareness of mental health risks and needs in children. Parents/caretakers, school personnel and physicians have expressed a need for education on these topics (Moon et al., 2017; Mukolo & Heflinger, 2011; van Vulpen et al., 2018). The findings for this study further support this need for education. They suggest that parents/caretakers may not recognize the mental health needs of their children and provide evidence that school and medical systems may not either unless children are in formalized school services through special education. Adverse childhood experiences and childhood mental illness have both been declared as serious public health issues (Forston, Klevens, Gilbert, & Alexander, 2016; Substance Abuse and Mental Health Services Administration (SAMSHA), 2018). Using a public health campaign with national reach through

federal government agencies, such as SAMSHA and the CDC, to saturate the public through media can improve overall awareness of these issues.

The Grand Challenges for Social Work also advocate for interdisciplinary and cross-sector collaboration between health, education, social, protection and justice services for young people in order to promote healthy youth development and prevent behavioral health problems (Hawkins et al., 2016). Using the school and medical systems to identify children who have mental health needs and have experienced adversity is ideal. These systems work with most children, which allow youth to be identified and interventions to occur early. This is preferable to identifying children through the child welfare and juvenile justice systems who only work with a smaller subset of youth after problems are identified. Unfortunately, the infrastructure to support school and medical systems in serving in this capacity has not been achieved. As evidenced by the current study findings, these systems do not adequately identify and facilitate mental health service utilization for children in need.

Both professionals in the education and medical systems understand their potential for intervening early and call for a collaborative, preventive approach (Atkins et al., 2017; Perrin, 2018). However, larger structural changes that require funding, policy development and implementation need to take place in order for these systems to adequately work collaboratively and in a coordinated manner. This also involves training teachers, pediatricians and other education and medical professionals who regularly interact with children in identification of mental health problems, education on how to manage problems such as behavioral and emotional symptoms, and information on how and where to refer children for services (Cole et al., 2011; Houston & Martini, 2013; Moon et al., 2017; Perrin, 2018). Improving collaboration through partnerships, colocation of services and other initiatives can also improve systems

responsiveness (Cole et al., 2011; Gabel, 2010). Social workers are integral in providing mental health services to youth in these systems (schools, hospitals and other medical centers, behavioral health centers and child welfare) and key advocates for needed structural changes.

Much work has been done on developing a Systems of Care approach to providing services to youth over the past several decades (Miller et al., 2012). Unfortunately, much like the school and medical systems, the infrastructure to support this initiative has not been broadly realized. While some Systems of Care function well and are inclusive of children's needs, this approach is not saturated throughout the nation and is largely unsustainable with current federal (e.g., provided through block grants) and state resources (Gould, Roberts, & Beals, 2009). Brashears, Davis, and Katz-Levy (2012) conducted a longitudinal study of system-level change in localities that received block grant funding. They found that there remained significant gaps in actually putting a System of Care into practice and collaboration among systems in the community remained a challenge. And when funding ended, any gains in developing a System of Care that had been made were lost. This is important because it shows that addressing mental health problems for children with ACEs requires developing clear and thorough guidelines at the federal level that involve all relevant stakeholders and state enforcement of those initiatives along with adequate and sustained resource availability. Applying this approach to school and medical systems could build their capacities to identify, refer and serve children in a way that is sustainable and integral to their work, which can make these systems more effective facilitators of mental health services for children with adverse experiences.

Another consideration for social work practice is how to address the barriers to accessing care related to parent/caretaker coping and emotional support. When children have parents/caretakers who are not coping well and do not have emotional support they utilize mental

health services less, as illustrated by this study. Social work practice needs to build parent/caretaker capacity in these areas. The CDC has put forth best-practice strategies for improving family functioning to enhance child well-being (Forston et al., 2016). They recommend strengthening household financial security; supporting parents and positive parenting through engagement by building positive professional relationships and providing parent education; enhancing parenting skills to promote healthy child development through childhood home visiting and parenting skill and family relationship approaches; and intervening to lessen the harms from ACEs and prevent future risk through parent behavioral training programs and evidence-based treatment for children and youth. Increasing early prevention programs that build parent/caretaker capacity through engagement and skill building is needed to assist parents/caretakers in developing the strategies and the support system needed to promote healthy child development, but also to facilitate service utilization when needed.

However, workforce capacity is a current barrier to achieving these goals and providing these services for parents/caretakers. There is a shortage of mental health services and providers for children in many localities. One study reports that based on the 2008 National Survey of Mental Health Treatment Facilities data, only 63% of U.S. counties have at least one mental health facility that provides outpatient services to youth and less than 50% have a facility that provides specialized programs for youth with severe emotional disturbance (Cummings, Wen, & Druss, 2013). Current mental health systems for children that do exist are overloaded with rather extensive waitlists (Gould, et al., 2009). There is also a widespread shortage of mental health professionals (Cummings et al., 2013; Fritz & Kennedy, 2012). More social workers and other mental health professionals are needed to address this shortage. Some solutions for social work

programs include stipends and tuition reimbursement for students who commit to working in these areas after graduation (Child Welfare Information Gateway, 2014).

This study has other implications for social work education. It builds on the social work values of social justice and working with vulnerable populations (National Association of Social Workers, 2017). Understanding the experiences of children with ACEs as a vulnerable population aligns with social work principles and core social work competencies (Commission on Accreditation, Commission on Educational Policy, & Council on Social Work Education, 2015). Curriculum that informs social work students on the biopsychosocial effects of trauma throughout the lifespan and prevailing prevention and intervention strategies in working with individuals who have experienced trauma is imperative given our role in working with this population in a multitude of settings including child welfare, mental health, schools and hospitals (Larkin et al., 2014). Social work students need to be able to recognize the signs and symptoms of emotional and behavioral problems in children. Information about the connection between trauma and mental health, risk factors that lead to both trauma and mental health problems and, finally, protective factors that can mitigate risk also needs to be imbedded in the social work curriculum.

The current study findings also align with the person-in-environment perspective of social work, in that parent/caretaker vulnerability factors decreased mental health services utilization and being in special education was shown to be a facilitator for services utilization. It is important to understand adversity within the environmental contexts that hinder service use, but also provide resources and support to promote healthy development (Larkin et al., 2014). Additionally, health professionals point to the need for multidisciplinary collaboration in order to build infrastructure, raise awareness and provide prevention and intervention services to children

(Atkins et al., 2017; Gould et al., 2009; Larkin et al., 2017; Stephan et al., 2015). Social work education emphasizes the development of skills in collaboration, negotiation and capacity building (Commission on Accreditation, Commission on Educational Policy, & Council on Social Work Education, 2015). Applying these competencies to work across disciplines will further strengthen our capacity to meet the mental health needs of children and to be a leader in this charge.

Conclusion

This study examined mental health services utilization for children in need of such services who experienced adversity, through a framework of factors and Systems of Care that influence access. The Gelberg-Andersen Behavioral Model of Vulnerable Populations was utilized to conceptualize how various traditional and vulnerability factors (predisposing, enabling and need) affect mental health services utilization for children who have experienced adversity. This study showed that while factors varied by the different levels of adversity, children who experienced adversity did not utilize mental health services any more than children who had not experienced adversity. Those children with ACEs were more likely to have an externalizing mental health condition and to have a severe mental health condition (typical promoters of services use), yet were also more likely to have parent/caretaker functioning factors that acted as barriers to getting needed mental health services.

School and medical systems did not effectively influence service utilization for most children or buffer parent/caretaker vulnerability factors. Special education was an enabling factor in assisting children in gaining access to needed mental health services. However, this was only for the small subset of children *currently* in special education. The lessons learned from federal-state Systems of Care initiatives could inform the development of capacity in

school and medical systems. Building the needed infrastructure to increase awareness and skills in parents/caretakers, train professionals to identify and intervene with children in need, and provide prevention and intervention services to children in the systems that they interact with will require a clear mission, stakeholder collaboration and sustainable resources. Social workers are poised to be important contributors in this initiative. We are integrated into school, medical, child welfare and mental health systems and have the skills to work with vulnerable populations and the essential knowledge of social systems and capacity building. Increasing specialized skills and knowledge in these areas can strengthen our impact in working with state and federal government and systems within the Systems of Care to realize the goal of improving access to mental health services for children who experience adversity.

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