

EXAMINING ACCESS TO MENTAL HEALTH CARE SERVICES AMONG CHILDREN
WITH ANXIETY/DEPRESSION, AUTISM OR AUTISM SPECTRUM DISORDER (ASD),
ATTENTION DEFICIT DISORDER (ADD)/ATTENTION DEFICIT HYPERACTIVITY
DISORDER (ADHD)

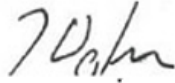
by

Ohud Baafif
A Thesis
Submitted to the
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of
George Mason University
in Partial Fulfillment of
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of
Master of Science
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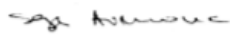
Committee:



Panagiota Kitsantas, Professor
of Biostatistics/Epidemiology,
Director, PhD Program in
Health Services Research,
(Thesis Director)



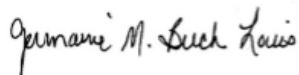
Janusz Wojtusiak, Ph.D.,
Committee Member



Sanja Avramovic, Ph.D.,
Committee Member



PJ Maddox, Ph.D., Department
Chair



Germaine M. Louis, Ph.D.,
Dean and Professor, College of
Health and Human Services

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by

Ohud Baafif
Bachelor of Health Administration
Umm Al-Qura University, Saudi Arabia, Makkah, 2012

Director: Panagiota Kitsantas, PhD
Professor of Biostatistics/Epidemiology
Director, PhD Program in Health Services Research
Department of Health Administration and Policy

Summer Semester 2020
George Mason University
Fairfax, VA

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Dedication

This is dedicated to my lovely parents and my wonderful family.

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“In the name of Allah, the Most Gracious and the Most Merciful”

In the beginning, all praise and appreciates are to Allah, the Almighty, for guidance and assistance. I thank Allah for his encouragement and blessing during my research journey, which provided me with the strength to complete my thesis. First and foremost, I would like to be grateful to all people who have been guided me throughout my research and being part of my journey in achieving my dream. I would not be able to complete my thesis. I would like to acknowledge my director Dr. Panagiota Kitsantas for her guidance, assistance, inspiration, and of course, her patience. I highly appreciated her support, knowledge, courage, and optimistic words, which gave me the enthusiasm to achieve my goal. Many thanks to the committee members for their assistance, effort, and support in order to improve my thesis. My appreciation to Dr. Janusz Wojtusiak for his help, time, and positive words through the process of this research. I extend my gratitude to Dr. Sanja Avramovic for supporting and assisting me through the thesis. I am highly indebted to my colleagues and faculty member at Umm Al-Qura University at Health Information Management Technology department for their moral support, inspiration, and wishes during my studying and completing my research work. Finally, I would like to express my love, respect, and regards to my family and friends who believed in me. Thank you so much for your praying, loving, invaluable suggestions, advice, inspiration, encouraging words, motivations, and unlimited support, which helped me a lot, especially in the difficult time during my thesis work. I thank God for having the most compassionate and caring parents in the world.

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List of Abbreviations

ABA: Applied Behavior Analysis	11
ACEs: Adverse Childhood Experiences	21
ADDM: Autism and Developmental Disabilities Monitoring.....	10
ADHD: Attention Deficit Hyperactivity Disorder.....	1
ASD: Autism Spectrum Disorders.....	1
CBT Cognitive Behavioral Therapy	10
CDC: Centers for Disease Control and Prevention.....	1
CSHCN: Children with Special Health Care Needs	15
EBDs: Emotional Behavior Disorders	13
FPL: Federal Poverty Level.....	30
HRSA MCHB: Health Resources and Services Administration's Maternal and Child Health Bureau	5
MBDDs: Mental, Behavioral, and Developmental Disorders	3
NIMH: National Institute of Mental	1
NSAF: National Survey of America's Families	17
NSCH: National Survey of Children's Health	4
ODD: Oppositional Defiant Disorder	30
SSRIs: Selective Serotonin Reuptake Inhibitors.....	10

Abstract

EXAMINING ACCESS TO MENTAL HEALTH CARE SERVICES AMONG CHILDREN WITH ANXIETY/DEPRESSION, AUTISM OR AUTISM SPECTRUM DISORDER (ASD), ATTENTION DEFICIT DISORDER (ADD)/ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

Ohud Ba'afif, M.S.

George Mason University, 2020

Thesis Project Director: Dr. Panagiota Kitsantas

Using the newest data of the National Survey of Children's Health (NSCH) 2017-2018, this thesis examines the difficulties in accessing mental health care services among children with depression/anxiety, Autism or Autism Spectrum Disorder (ASD), and Attention Deficit Disorder (ADD)/Attention Deficit Hyperactivity Disorder (ADHD). It attempts to investigate the barriers, and challenges, which prevent children with depression/anxiety and ASD/ADD/ADHD from accessing the mental health care services needed and their association with the difficulty getting these services. Adapting Andersen's Behavioral Model of health care utilization, which involves three critical elements related to the associated factors with health care utilization, including predisposing factors, enabling factors, and need factors. To do that, many analyses have been conducted for all two conditions separately, first, to measure the sample characteristics and distribution of

sociodemographic and health-related characteristics, weighted descriptive analysis was made, then to assess the association between difficulties in accessing mental health care services and children's characteristics, weighted bivariate analyses were performed. Moreover, two binary multiple logistic regression models and two classification trees using CART were built to identify the factors that influence the mental health services access and the association between dependent and independent variables in order to identify the risk factors associated with difficulties in obtaining mental health services. The results showed that most of the independent variables greatly influence the difficulty in accessing health care services, which was expected. To be more specific, both methods have proven that the enabling factors, such as adequacy of health insurance and ability of families to pay medical/health-related bills have more influence on children with depression/anxiety and ASD/ADD/ADHD, which leads to difficulties in accessing mental health care services.

CHAPTER 1: Introduction

This chapter provides background information of the study, problem description, the purpose of the study, significance and importance of the study, and a description of the conceptual or theoretical framework used in this study.

Background and Problem Description

The U.S. National Institute of Mental Health (NIMH) indicates that mental disorder, which is one of the most common types of conditions in the (U.S), affects millions of individuals every year, and only half of them receive treatment (National Institute of Mental Health, 2018). According to the estimates from the Centers for Disease Control and Prevention (CDC), 50% or more of the U.S population will be diagnosed with a mental health condition during one of their life stages (Mental Health, 2018). Also, one in five Americans have experienced a mental disorder in a given year, and one in twenty-five of them will have a severe mental health condition (Children's Mental Health, 2020).

Children are one of the main groups who suffer from mental disorders in the USA. In children, a mental health disorder refers to changes occurring in a child's behavior and activity, such as attention-deficit/hyperactivity disorder (ADHD), behavior disorders, mood, anxiety disorders, autism spectrum disorders (ASD), and substance use disorders (Children's Mental Health, 2020). Studies show that at some point in their lifetime, one in five children experience a mental illness (Children's Mental Health, 2020). In Addition, according to the 2016 Children's Mental Health Report, mental health illnesses are

prevalent mostly among school-aged children (2016 Children's Mental Health Report., 2017). The same report pointed out that around 80% of mental illnesses, especially chronic mental disease, have started in the childhood period and/or before the age of 14.

According to the CDC (2019), one of the most common mental disorders that children are diagnosed with is Attention-deficit/hyperactivity disorder (ADHD), as 6.1 million of American Children suffer from it. This disorder can be defined as a neurodevelopmental illness that can be diagnosed in childhood and can continue to adulthood (Children's Mental Health, 2020). It also refers to problems in paying attention and the inability to focus because of hyperactivity (Children's Mental Health, 2020). Furthermore, 4.4 million of children in the USA have anxiety, which is one of the other common mental disorders. This disorder refers to a behavioral problem that is caused by fear, concerns, and worries about specific things, such as future, school, and being alone. In addition, approximately 1.9 million of the children in the USA suffer from depression, which refers to sadness and hopelessness that can occur to any child (Children's Mental Health, 2020). Moreover, the ASD condition is a "developmental disability," which can affect a child's behavior and lead to communication, social, and emotional changes. Children with ASD have their own way to learn, think, and solve problems, which is different from other children (Autism Spectrum Disorder, 2020). The CDC reported that in 2020 "approximately 1 in 54 children in the U.S. is diagnosed with an autism spectrum disorder (ASD)" (Autism Spectrum Disorder, 2020); "1 in 34 boys and 1 in 144 girls identified with autism" (Autism Spectrum Disorder, 2020).

Moreover, some children may have a combination of these two or more mental health conditions (Children's Mental Health, 2020). For instance, among children between 3-17 years old with depression, approximately 73.8 % of them have anxiety, and about 47.2% have behavioral problems (Children's Mental Health, 2020). In the same age group of children with anxiety, 37.9% of those children have behavioral problems, and around 32.3% have depression as well (Children's Mental Health, 2020). Also, for those who have behavioral problems, approximately 36.6% have anxiety, and 20.3% have depression (Children's Mental Health, 2020).

Although the number of children suffering from mental health issues is significantly high in the USA, very few have access to health care services because of many factors, one of which is racial and ethnic differences (Moon et al.,2018). Black children were less likely than white youth to get access to mental health services despite being diagnosed with behavioral disorders more often (Inkelas et al., 2007; Planey et al., 2019). Additionally, demographic factors and socioeconomic status are associated with unmet health care needs (Pappa et al., 2013). These factors include insurance coverage, poverty level, the structure of the family, primary language spoken in the home or use of English in their home, income, and place of birth (Green et al., 2019; Miller et al., 2019). Moreover, Miller and his colleagues (2019) addressed other factors, such as the cost of health care, transportation, and obstacles in scheduling an appointment and how they constitute important barriers in regard to receiving mental health care services, especially for children with special health care needs.

Furthermore, according to the Morbidity and Mortality Weekly Report (2018), the percentage of children who live in low-income households and have been diagnosed with childhood mental, behavioral, and developmental disorders (MBDDs) was higher than those who resided in high-income households. Nonetheless, in 2017, a very low percentage of those children with MBDDs residing in low-income households visited health care providers and benefited from other health care services (CDC, 2018).

All children suffering from mental issues need to have access to childhood mental health care because it helps the child develop emotional, social, and learning skills in order to build experiences to deal with and manage their life issues and difficulties (Children's Mental Health, 2020). As a result of having good mental health status, those children can contribute to, develop, elevate, and promote their societies (Children's Mental Health, 2020). Consequently, they can have a high quality of life, succeed in their studies, build relationships, and learn new things (Children's Mental Health, 2020). In fact, not having this childhood mental health care can worsen the children's mental conditions and lead to significant changes in their behavior, emotion, learning, and communication (Children's Mental Health, 2020). They may also suffer from low academic performance and outcomes in school, home, and life in general (2016 Children's Mental Health Report., 2017). Furthermore, mental disorders experienced in childhood can carry into adulthood, which can affect their cognitive abilities and daily life functions (Ghandour et al., 2019).

Previous research studies focused on addressing the unmet needs for care coordination and health disparities among children with specific mental health conditions, such as ASD and anxiety (Green et al., 2019; Miller et al., 2019). Even though many studies

have investigated different factors that prevent children and their families from getting access to health care services (McMorrow & Howell, 2010; Green et al., 2019), there are limited studies on the topic of the association between sociodemographic factors, health-related factors and access to mental health care services specifically for those suffering from depression/anxiety and ASD/ADD/ADHD. In addition, there are no recent studies addresses the unmet needs among children with specific mental health conditions using newer data at the national level, such as the National Survey of Children's Health (NSCH) 2017-2018.

The purpose of this study is to examine difficulties in accessing mental health care services among children with depression/anxiety and ASD/ADD/ADHD. It also aims to investigate the barriers, and challenges, which prevent children with depression/anxiety and ASD/ADD/ADHD from accessing the health care services needed. This study used combined data from the 2017-2018 NSCH. The data were obtained from the Health Resources and Services Administration's Maternal and Child Health Bureau (HRSA MCHB). The NSCH provides information about children's mental and physical health, access to health care services, characteristics of their families, schools, neighborhoods, and social skills for 0-17 years old children in the United States.

Findings from the present study can be used in the improvement of mental health care services for a possible wide range of children with mental health disabilities and special health care needs. Identifying children with unmet mental healthcare needs at an early stage is crucial as targeted interventions can improve their quality of life and prevent long-term adverse health outcomes. In fact, studies that focus on the assessment of risk

factors for unmet mental health services are needed as they can provide vital information for children who might be at high risk for not receiving proper care. Therefore, the information in the present study can be useful for both healthcare providers and policymakers who can use the findings of this study to update or initiate a new policy that ensures adequate care services for the target population.

Conceptual or theoretical framework for the study

To examine the association between the factors and the difficulty in accessing mental health services, this study employs the Andersen Behavioral Healthcare Utilization Model, which is a conceptual framework developed by Ronald Andersen (1968) in order to investigate the utilization of medical health care services and their disparities among families, children, adolescence, and young adults in the U.S. The framework is known as the Andersen's model, and all health researchers use it as a theoretical framework to examine associated factors with health care process and utilization (Andersen, 1995; Moonesar, 2015; Karpur et al., 2019). The original Andersen's model was initiated in 1960, after that, it has been improved through four stages, including phase 1 the original model (1960s), the model phase 2 (1970s), the model phase 3 (1980s-1990s), and the existing model phase 4 (1995), which is the Andersen model of healthcare utilization. At each stage of the four phases, Andersen revised the model based on the researchers' analysis and recommendations to ensure the improvement of the health care system (Andersen, 1995; Moonesar, 2015).

The model consisted of three main elements related to associated factors with health care utilization, which are predisposing factors, enabling factors, and need factors, as shown in Figure1. Therefore, after reviewing numerous theoretical frameworks, adapting

the Andersen model of healthcare services utilization was best and appropriate for this research study.

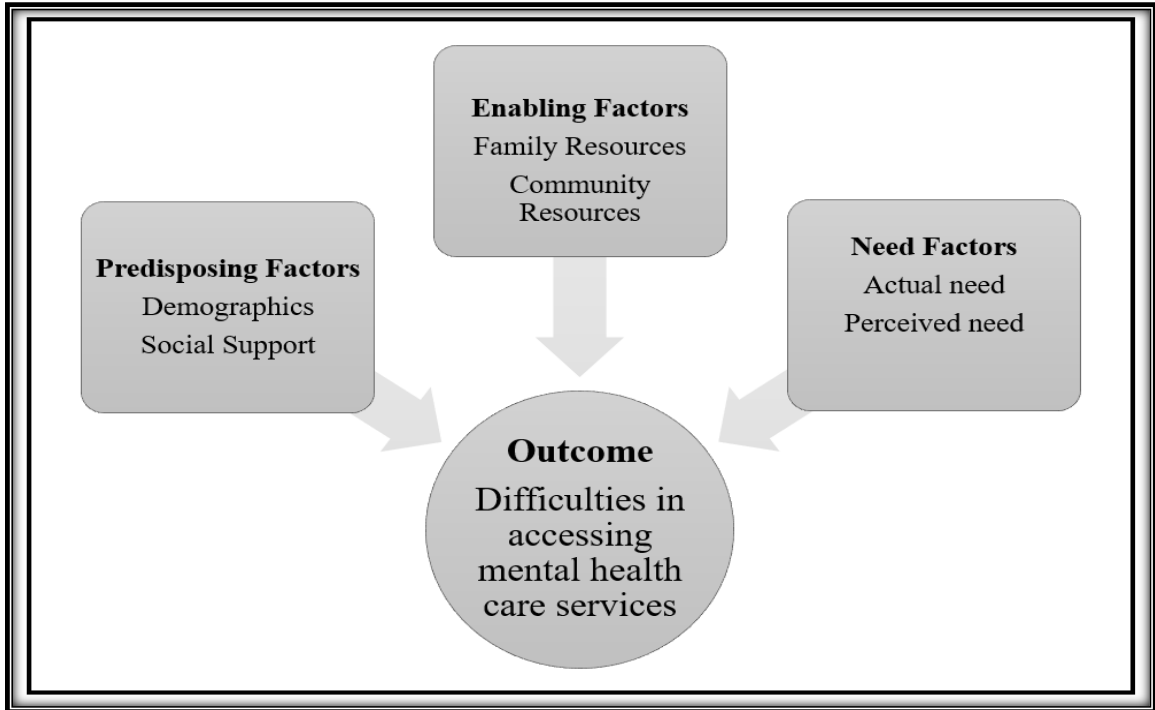


Figure 1. Andersen's model

Organization of the Study

There are 5 chapters in this study. Chapter one presented an introduction that provides the background information of the study, problem description, purpose of the study, significance of the study, and the conceptual framework applied in this study. Chapter two includes a review of the literature on mental health care services and difficulties in accessing mental health care services among children with anxiety/depression and ASD/ADD/ADHD. Chapter three describes the methods used in this study, which includes the research design, data description, study sample, measures, and statistical analysis. Chapter four displays and describes the results of the study and

summarize the finding, which include descriptive analyses, bivariate analyses, binary logistic regression analyses, and classification trees for children with anxiety/depression and ASD/ADD/ADHD. Chapter five presents a discussion of the study's findings, limitations, suggestions, and recommendations for future research and studies.

CHAPTER 2: Literature Review

This chapter provides a review of the literature on mental health care services and focuses on the difficulties in accessing mental health care services among children with anxiety/depression and ASD/ADD/ADHD. It is organized into four sections: Mental Health Care Services for Children, Mental Health Care Services for Children with Depression/Anxiety, Mental Health Care Services for Children with ASD/ADD/ADHD, and Factors Associated with Unmet Mental Health Care Service.

Mental Health Care Services for Children

Mental health in children is a crucial for public health issue. Therefore, diagnosing and addressing mental health conditions in early stages, such as in childhood or in school years will be beneficial for the children and their families (Children's Mental Health, 2020). However, not all children with mental health conditions are diagnosed and recognized with having mental health conditions even if the child has symptoms (Children's Mental Health, 2019). For those who were diagnosed with a mental health disorder, only around 20% of them receive health care services from mental health care specialists (Children's Mental Health, 2020).

Children with mental health conditions need specific care, such as behavioral health services which include diagnosis of the illness, consultation, and treatment (Children's Mental Health, 2020). However, accessing those services may be difficult depending on

the availability of health care providers in areas where the children live. As a result of that, many families might need to travel long distances, especially for those who live in the rural areas (Children's Mental Health, 2020). High cost of mental health care and not having continuous and adequate insurance coverage are also important reasons for lack of access to mental health care services (Children's Mental Health, 2020).

There are several categories of mental and behavioral health services which might be offered to children by the county location, such as pediatricians, family medicine physicians, psychiatrists, psychologists, and licensed social workers (Children's Mental Health, 2020). For pediatric primary care, about nine in ten children receive medical care from primary health care physicians (Children's Mental Health, 2020). Nevertheless, one in three among those pediatricians have adequate health training to provide appropriate diagnoses and treatment for children with mental health conditions (Children's Mental Health, 2020).

Also, because of a limited number of mental health specialists in all areas, the most common recent method used to improve access to mental health care for children is Behavioral Health Integration (BHI) approach (Children's Mental Health, 2020). This approach works by providing mental and behavioral health examination, treatment, and specialty care in the pediatric primary care centers through collaboration and interaction with mental health care specialties (Children's Mental Health, 2020). Moreover, a variety of services can be provided by using technology, which facilitates and enhances the access to mental health care services. For instance, by using "Telemedicine and Telepsychiatry" services patients can get consultation and treatment for their mental disorders through

communicating with a psychiatrist and other health care specialties (American Academy of family physicians, 2018). In addition to that, the Centers for Disease Control and Prevention (CDC), aims to test new programs to discover useful techniques in training mental health care providers (Children’s Mental Health, 2020).

Mental Health Care Services for Children with Depression/Anxiety

Although there are some health care services for children with mental health disorders in general, there is a gap in providing special care services for those with specific types of mental health disorders like anxiety and depression (Green et al., 2019). Anxiety and depression are common among children and the percentage of children who are diagnosed with those conditions is increasing every year. For example, the percentage of children with anxiety has risen from 5.5% in 2007 to 6.4% in 2011/2012 (Children’s Mental Health, 2020). Also, for the same time period, the percentage of children who were diagnosed with depression increased from 4.7% to 4.9% (Children’s Mental Health, 2020). Moreover, the number of children who have either anxiety or depression has grown between 2003, 2007, 2011, and 2012 to be 5.4%, 8%, and 8.4% respectively (Anxiety and Depression in Children, 2020). However, despite this large growth in number of children suffering from anxiety and depression, less attention was given to the kinds of services that should be offered to this specific group (Anxiety and Depression in Children, 2020).

In fact, for this specific group of children, the only approaches used to treat them are “cognitive-behavioral therapy (CBT) and exposure-based therapies, selective serotonin reuptake inhibitors (SSRIs), and medication,” which are incompatible with the huge number of children suffering from this kind of mental health issues (Anxiety and Depression in Children, 2020). Freidl and his colleagues (2017) have stated that using

medication with these techniques is useful and beneficial, but it is insufficient to meet their needs. Even though a variety of ways to address anxiety in children and adolescents have shown their effectiveness, studies have proven that the percentage of children who will be diagnosed with mental conditions, such as anxiety, continue to grow while the gap in treatment of their conditions remains highly large (Anxiety and Depression in Children, 2020; Freidl et al., 2017). In other words, there is a high percentage of children who have unmet mental health care needs and still do not receive mental health care.

Mental Health Care Services for Children with ASD/ADD/ADHD

Like children with anxiety/depression, children with ASD/ADD/ADHD also suffer from lack of health care services needed to improve their conditions despite their increasing number. According to CDC and Autism and Developmental Disabilities Monitoring (ADDM) Network, 1 in 54 children whose age is around 8-year-old has been diagnosed with ASD in 2016 (Data & Statistics on Autism Spectrum Disorder, 2020). In addition, the prevalence of developmental disability has increased from 16.2% in 2009-2011 to 17.8% in 2015-2017. To be more specific, the percentage of children who were diagnosed with ASD has grown from 1.1% to 2.5% and for those with attention-deficit/hyperactivity disorder (ADHD), it increased from 8.5% to 9.5% (Developmental Disabilities, 2019).

This kind of negligence is discussed in one study titled “Unmet Need and Problems Accessing Core Health Care Services for Children with Autism Spectrum Disorder,” which has confirmed that families of children who have ASD were at higher risk of having unmet mental health care needs and receiving treatment from the specialist (Chiri & Warfield, 2012). The same study has shown that one of the main obstacles in accessing treatment for

these children was the inefficient training and lack of experience and skills of health care providers (Chiri & Warfield, 2012).

However, ASD seems to receive more attention compared to ADD and ADHD regarding health care services. For example, there are several types of treatment applied on children with ASD including Applied Behavior Analysis (ABA), which can be used to improve children's skills and behaviors through supporting positive behaviors and deterring negative ones (Autism Spectrum Disorder (ASD), 2019). In addition to that, technology, more specifically the online communication, is employed in order to improve social skills. Furthermore, to improve verbal interaction abilities, speech therapy can be offered by teachers with special training (Autism Spectrum Disorder (ASD), 2019). Yet the only services offered for children with ADD/ADHD are behavioral therapy, which involves parents in treatment plans of their children through specific training, and medications (Attention-Deficit/Hyperactivity Disorder (ADHD), 2019).

Factors Associated with Unmet Mental Health Care Services

Factors associated with unmet mental health care services are summarized based on the Andersen's model (Andersen, 1995) that was used in this study (Andersen, 1995; Moonesar, 2015). The conceptual model shown in Figure 2 describes different factors associated with health care utilization discussed in the literature review. Therefore, factors that influence mental health care services for children were divided into three main groups, namely, predisposing factors, enabling factors, and need factors based on the Andersen's model. The predisposing factors include demographic and social structure characteristics of children. The enabling factors involve the personal/family and community resource while the need factors include the actual and perceived need for mental health care services.

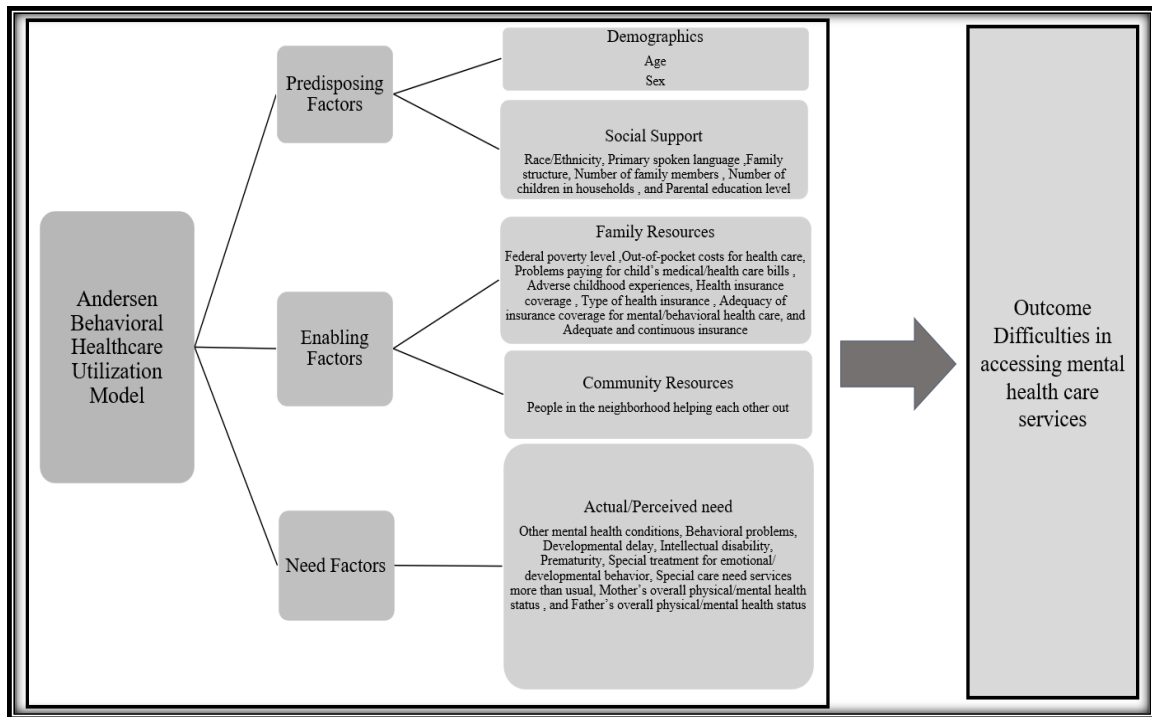


Figure 2. Conceptual Framework of the study

Predisposing factors
Demographics

Age: studies show that adults are more likely to benefit from mental health care services than children (Jones, 2019). According to the American Psychological Association (APA), about 15 million of America’s youth suffer from a mental or emotional illness, and only 20% get mental health treatment. Also, for those who received treatment, only 7 percent of them receive appropriate one, which is receiving a continuous of home mental health services and supports from the appropriate behavioral health provider, “in the least-restrictive environment (at home and in the community), at the frequency, duration, and intensity needed to address a mental illness or condition” (Jones, 2019). The APA concluded in 2009 that the youth “most in need or at highest risk are least likely to have

access to the highest quality [mental health] interventions.” In addition, even among children, there are disparities in the types of services received (McMorrow & Howell, 2010).

Simon (2015) reported that school-age children with Emotional Behavior Disorders (EBDs) needed mental health services, yet half of them did not receive neither medication nor psychosocial services. “In 2010–2012, 5.8% of U.S. children ages six to 11 had serious EBDs and 17.3% had minor EBDs. Among children with EBDs, 17.8% were receiving both medication and psychosocial services, 28.8% psychosocial services only, 6.8% medication only, and 46.6% neither medication nor psychosocial services” (Simon, 2015). However, compared to other age groups, school age children are more likely to benefit from medication while adolescents are more likely to get inpatient psychiatric care services (McMorrow & Howell, 2010). In fact, studies show that the infant and toddlers are the least likely to benefit from mental health services (cole et.al, 2017). Researchers reported that roughly 10 to 14 percent of children ages 0 to 5 have an emotional or behavioral issue, yet many cases were unidentified or unreported (cole et.al, 2017). According to a national survey, although some of them were identified, more than half do not receive mental health treatment needed for their wellbeing (cole et.al, 2017).

Gender: in addition to age, gender seems to play an essential role in accessing mental health care services. Studies show that boys have more mental health needs than girls. Even the type of disorders differs from boys to girls; that is, while boys are more prone to getting disruptive disorders and autism spectrum disorders, girls are more likely to get to anxiety and depression (McMorrow & Howell, 2010). Also, even though both girls and boys would

have the same conditions, the symptoms of each would be manifested differently (Hamblin, 2016). Even the consequences differ between the two; for example even though both boys and girls are likely to run away in adolescence, “girls are more likely to come to the emergency department having attempted suicide” (SAMHSA 2010) and “boys are more likely to have disruptive behavior that puts them in contact with the juvenile justice system” (Uniform Crime Reporting Program 2003) (McMorrow & Howell, 2010). In addition, gender can also play a significant role in seeking help. Studies show that girls and women are more likely to seek help for mental health issues than boys and men (Hamblin, 2016). In this context, there seems to be an ongoing debate regarding who has more difficulty accessing mental health care services. Some studies maintain that girls were less likely to receive care than boys (Mulraney & Hiscock, 2019) while others report that boys are less prone to benefit from these services (Lipari et al., 2016).

Social Support

Race/ethnicity and language spoken at home: disparities in service use are very common because of differences in ethnicity and race. In other words, the level of mental health services received differ from one ethnic group to another. A number of studies show that minority children and youth are less likely to access mental health care services (McMorrow & Howell, 2010). Studies show that even if black and white youth may have a similar mental health problem after controlling for other factors such as poverty, race “use of services is lower” (Angold et al. 2002; Burns et al. 2004; Kodjo and Auinger 2004). Similarly, Latino youth are more likely to suffer from the same difficulty due to their ethnicity (Hough et al. 2002; Howell and McFeeters 2008; Zimmerman 2005; Garland et al. 2005; Inkelas, Raghavan, Larson, Kuo, and Ortega 2007). In addition, “in a review of

10 studies, seven show that minority youth have lower rates of mental health service use” (Elster, Jarosik, VanGeest, and Fleming 2003).

This is also supported by Irvin and colleagues (2018) who found that having access to health care services was substantially associated with race/ethnicity inequalities among families. For example, black children were more likely to have unmet health care needs, especially those who resided in rural areas compared to white children. For those black children from two-parent family structures who lived with low income and non-continuous insurance coverage, they had a high chance of unmet health care needs (Irvin et al., 2018).

In addition, primary language spoken at home has been associated with unmet mental health services. A study examined the predictors of unmet mental health needs among Children with Special Health Care Needs (CSHCN) and their families in order to identify the effect of language spoken at home and race/ethnicity on children’s mental health conditions and their families (Inkelas et al., 2007). Findings from this study showed that Hispanics and black children had higher rates of having unmet health needs. Moreover, compared to the other racial/ethnic groups, higher odds of unmet health needs were associated with family members who spoke the Spanish language (Inkelas et al., 2007; Kataoka et al., 2002).

Family Structure: family structure, which is defined as the marital status of the parents or the caregivers of the children (Edwards, 1987), has undergone a significant change in the United States in the past 3 decades (Heck & Parker, 2002). Between 1970 and 1997, the number of children living in two-parent families decreased from 59 million

to 48 million while the number living in single-mother households went up from 7 million to almost 17 million children (Bureau of the Census, Table CH-1, 2001). This has affected children access to health care. Since children are dependent on their parents to have access to health care, and a transition in family structure may significantly affect the ability of parents to meet their children's needs (Heck & Parker, 2002). The parents' socioeconomic status may change as a result of the change on family structure and that may affect children's health care access and utilization (Heck & Parker, 2002). Also, single mothers are less likely to work full time, which may create a lot of difficulties for their children accessing health care needs (Heck & Parker, 2002).

Furthermore, studies show that children of single mothers are less likely to visit a physician and more likely to have their children health care needs unmet (Simpson et al. 1997). This aligns with Cunningham and Hahn (1994) who claimed that children with single mothers are more prone to have difficulty accessing health care. However, Newacheck (1992) maintains that family structure has nothing to do with the number of physician visits that children have. In the same vein, Cafferata and Kasper (1985) explained that children of single mothers were more likely to visit a physician. In addition, Heck & Parker, 2002 in their study showed that children with two-parent families are more likely to face issues accessing health care than the ones with single mothers, which might be attributed to having Medicaid.

Parental Education: parental education level is another factor which is associated with accessing mental health care services for children. Educated parents are more likely to recognize their children needs and the types of mental health services they need and

address them accordingly. In other words, they will do their own research to familiarize themselves with the available services available for their children, such as special care services and the appropriate health care providers. One of the studies have proven the role that parental education level plays in the kind of services their special needs children will get (Heck & Parker, 2002). The Heck & Parker study (2002) shows that parental education plays a significant role in children accessing health care services.

Even if some studies show that children with single mothers are less likely to access mental health services, the single mothers' educational level can play an important role. In other words, a single mother with high education level is more likely to know their children's needs and seek help. Another study's results show that children who have parents with low level of education lacked access to health care service (Porterfield and McBride, 2007). Generally, educated parents were more likely to discover their children's needs and requested specialized care to meet their needs.

Enabling Factors

Family Resources

Poverty level: poverty can have a tremendous impact on the children's mental health (Farmer et al. 2001). According to the National Survey of America's Families (NSAF), "11.7 percent of poor children have an emotional/behavioral issue using parent reports from the Child Behavior Checklist, while only 6.4 percent of nonpoor children have such issues" (Howell 2004). Not only does poverty level affect children's mental health, it can also be one of the top barriers to their access to mental health care services. Indeed, even though many studies have shown the negative effects of poverty on children's mental well-being, these children still suffer from the lack of access to the needed mental health

services. For instance, Karpur and his colleagues (2019) conducted a study to explore the unmet mental health needs among children with ASD. The study illustrated that children living in families whose income is below 100% of FPL poverty level were more likely to be diagnosed with ASD and less likely to benefit from the basic mental health care services (Karpur et al., 2019). Additionally, longitudinal research shows that children whose poverty level is high are more prone to suffer from mental health problems and also unmet mental health needs compared to children with low poverty levels (Hodgkinson, 2017). In addition, other researches showed that lack of access to health care services, especially for those with mental health care needs were significantly associated with low income (Porterfield and McBride, 2007). Other studies show that only 15% of children with mental health issues receive services, and less than that complete their treatment (Hodgkinson, 2017).

Moreover, studies indicate that Native American children in urban areas are less likely to have difficulties accessing mental health care services than white children, whereas black children living in urban areas and Latino children in both rural and urban areas are more likely to struggle accessing mental health care than white children (Hodgkinson, 2017). In Addition, compared to white children in the urban areas, white children in rural areas are more prone to face difficulties benefiting from the mental health care services (Hodgkinson, 2017). The disparities observed in accessing mental health services due poverty can be explained by practices employed at local clinics. For example, clinic hours are mostly set during the day and that may not be easy for people working low wage jobs as they may not be flexible to make appointment during business hours

(Hodgkinson, 2017). Overall, children living in households with high poverty level have more unmet mental health care needs than their counterparts who are not facing poverty.

Out-of-pocket costs for health care services and problems paying for child's medical/health care bills, and family size: cost of mental health services in the USA is very expensive “costing \$8.9 billion per year compared to the next most expensive condition, asthma, at \$8.0 billion” (McMorrow & Howell, 2010). In addition, children's mental health conditions are more than three times as costly as infectious diseases (\$2.6 billion a year). Some of these expenses are paid by Medicaid, private or public insurance. However, this poses a lot of difficulties especially for those who pay out-of-pocket because of the high expenses. Research shows that individuals with psychiatric conditions have higher out-of-pocket health costs than those without psychiatric conditions (Russell & Fellow, 2010), and around 14 percent of patients with a mental issue have out-of-pocket expenses that exceed 20 percent of family annual income (Rowan et al., 2013).

Additionally, “while children with mental health claims represent only 6.6 percent of covered children in a private insurance data base, these children incur about 35 percent of inpatient costs and 20 percent of total costs for children (Larson, Miller, Fleming, and Teich 2007)” (McMorrow & Howell, 2010). In other words, the insurance cannot cover all the expenses of the mental health services because of the high costs.

In addition, the medical costs get higher for those with multiple mental health conditions (Porterfield and McBride, 2007). For instance, some studies have stated that children with multiple chronic mental health conditions, especially those with emotional, behavioral, and developmental problems, demand higher treatment or counseling for their

conditions (Inkelas et al., 2007). This can be costly and unaffordable for many families and that can explain why many of these children do not benefit from the mental health care services needed for their recovery (Inkelas et al., 2007).

Family size can also play an essential role in accessing mental health services. Because of the high cost, having a big family size can pose a lot of difficulty trying to afford the services for children with mental issues. A Chinese study trying to find out the influence of predisposing, enabling, and need factors in utilization of health services among rural residents found that “married females with smaller family sizes were more likely to endorse willingness to use health services” (Li et al., 2016). In other words, given the high costs of medical services, small families of children with mental health will be more likely able to afford and utilize mental health care services.

Health insurance: financial difficulties can be a major barrier to receiving needed care. Many people seem to be concerned more about the cost of the mental health services and the health insurance coverage as factors for not utilizing mental health care services. Research shows that people with mental health conditions are less prone to having health insurance than those without mental health issues (Rowan et al., 2013). For adults with severe mental health issues, for example, 37% of them were uninsured “for at least part of the year, compared to about 28 percent of people without severe mental illness” (Rowan et al., 2013). Another study in 2017 showed that the likelihood of getting health insurance for people with severe mental illnesses is 40 percent lower than those without the mental illness (Rowan et al., 2013).

Other research studies show that having adequate health insurance coverage enable children and their families, especially those with chronic mental health conditions and special health care needs, to access mental health care services (DeRigne et al., 2009). Even among the insured, health care costs can be one of the main impediments to getting needed mental health care, especially when some types of insurance might not be of help to the people suffering from mental health issues (Rowan et al., 2013). In fact, some studies showed that there is a significant association between accessing mental health care services and health insurance type. For instance, Sturm and Wells (2000) noticed that there was a decrease in private coverage for people with mental illness in the late 1990s and mental services were not fully covered by the private sector. Furthermore, one study indicated that uninsured children were more likely to have their mental health care needs unmet (DeRigne et al., 2009). Also, DeRigne and his colleagues (2009) stated that parents of insured children, specifically those with private health insurance were more likely to report that mental health care needs of their children were unmet compared to children covered with public health insurance like Medicaid.

Adverse childhood experiences: adverse childhood experiences (ACEs) can be associated with mental health services access. Adverse childhood experiences are considered traumatic events that may occur in childhood 0-17 years (Violence Prevention, 2020) and can include emotional, physical, or sexual abuse, physical neglect, violence, and parents' mental issues (Violence Prevention, 2020; Bauer, 2019). Children with exposure to adverse childhood experiences are at a higher risk of being diagnosed with anxiety and/or depression and other mental diseases (Zare et al., 2018). Lipman and colleagues

(2002) found that aggressive parenting in single-parent families can lead to the child getting psychological problems, such anxiety and depression.

In addition, children's mental wellbeing has been associated with parents' mental health. Healthy parents are more likely to seek help for their children, whereas parents with mental health issues are more likely to neglect their children (Cairney et al., 2004). Neglect can be caused by different factors, one of which is poverty. Poverty can increase the chance of parents developing mental health issues which can weaken their ability to involve in "positive parenting practices (e.g., warmth and responsiveness, nurturance, supervision) and increase the potential for child abuse and neglect" (McMorrow & Howell, 2010). As a result, they are less likely to seek help for their children. For example, studies show that "caregivers with depression or substance abuse are less likely to seek and obtain mental health care for their children (Gaskin and Mitchell 2005; Whitson, Connell, Bernard, and Kaufman 2010)" (McMorrow & Howell, 2010). Additionally, parental neglect can be caused by their feelings of stigma (Heath, 2019). Studies show that some of the children with special needs have a harsh childhood because of their parents' negligence and discrimination. In other words, some of them see their children's mental health issues as a stigma and neither do they want to share it with anyone nor are they willing to search for care services that would help them treat their conditions (ACEs) (Zare et al., 2018).

Community Recourses

People in the neighborhood helping each other out: In addition to family, studies show that the involvement of other members can be so helpful for children with mental health diseases (Kutcher and MacCarthy, 2011). An example of people who might help in the child care is neighbors. The support can take different forms; it can be emotional and

social. For example, many families feel ashamed of sharing their children mental issues with anyone and seeking help because of the stigma associated with mental health diseases (Knaak et al., 2017). Yet, having good neighbors who support these families emotionally and socially can make this family feel at ease and normalize their children's mental health issues. In fact, studies show that "living in a neighborhood lacking social support (i.e., neighbors who "help each other out," "watch out for each other's children," and can be "count[ed] on" and "trusted to help my child") can have a negative influence on children. Another way neighbors can help children with mental health care services is facilitating the access to mental health services (Robinson et al., 2017). In other words, living in a community where neighbors help each other out can help families who have children with mental health issues in many ways, one of which facilitating the access to mental health care services.

Need Factors

Needed special care more than usual and special treatment for emotional developmental behavior: despite their desperate needs, many of the children with mental health conditions don't have access to mental health services (Murphey, 2013). DeRigne and colleagues (2009) stated that around 20 % of children who have different mental health conditions did not received treatment or counseling in 2008. Moreover, around 1 in 5 adolescents have been diagnosed with mental health disorder, yet many of them did not receive treatment (Murphey, 2013). Around 20 percent of adolescents have mental health disorders, but between 60 and 90 percent of them did not receive treatment (Murphey, 2013). Most of those who fail to get treatment are the ones with the highest needs (Murphey, 2013)

Behavioral problems, Intellectual disabilities, Developmental delay, and other mental health conditions: Research shows that people with chronic illnesses, such as cancer, heart disease, and neurological disorders are more vulnerable to have mental disorders, such as depression and anxiety (Russell & Fellow, 2010). Mental illness accompanied with other health conditions complicates treatment because of the high medical costs. Patients with mental issues, behavioral problems, and other health conditions are more likely to utilize general medical services and have higher medical expenses compared to those without mental disorders (Russell & Fellow, 2010). For example, the cost of having some chronic diseases, such as diabetes along with mental ailment including depression is 4.5 times higher than the medical cost of those without mental conditions (Russell & Fellow, 2010). In addition, children and youth with comorbid mental and medical illnesses have more needs and higher medical costs than their counterparts of the same age and with a single condition (Russell & Fellow, 2010).

Furthermore, Krauss and colleagues (2003) reported that children with mental retardation and autism have higher difficulties accessing mental health services than those with other health conditions. In fact, the same study maintained that “80% of children who needed mental health services, did not receive those services.” These difficulties can be more complicated for those with comorbidities, such as development disabilities (DD) (Nageswaran et al., 2010). The latter refers to the chronic physical and mental conditions that an individual may develop before the age of 22 and last through the rest of his/her life (Nageswaran et al., 2010). Examples of DD could be mental retardation, autism, spina bifida, Down syndrome and cerebral palsy (Nageswaran et al., 2010). Research shows that

children with both DD and Mental disorders are more likely to have difficulties accessing health care services (Nageswaran et al., 2010). This is consistent with the study of Nageswaran and his colleagues (2010), who found that children with both DD and mental disorders have greater special needs, yet they still face more complications accessing health care than other children without comorbidities.

Mother's and Father's overall physical/mental health status: family plays an essential role in taking care of the family members who have a mental disorder, especially as a caregiver. The family is one of the main resources that the patient needs in his/her recovery journey. Thus, parents as caregivers' good mental health is very important for the children's well-being. In fact, having mentally healthy parents has been associated with children's physical and psychological health and their access to mental health services. Previous research findings show that living with depressed parents can affect children's health negatively (England and Sim, 2009). England and Sim (2009), stated that "Depression in parents has been consistently associated with a number of behavior problems and psychopathology in children, including higher rates of depression, earlier age of onset, longer duration, greater functional impairment, higher likelihood of recurrence, higher rates of anxiety, and higher rates and levels of severity of internalizing and externalizing symptoms and disorders in children and adolescents." Not only can unwell mental health of parents lead to their children having mental issues, the parents' health condition can also impede their children with mental issues in accessing mental health services.

Parents have a crucial role in facilitating access to mental health services for their children (Sayal, 2006), especially before late adolescence; “parental disapproval can also inhibit young people from seeking help” (Chandra and Minkovitz, 2006). A recent survey indicated that over half of parents had never communicated with their children regarding mental health, and “45% did not feel the need to” (Opinion Matters, 2015).

Some parents may not be aware of their children’s needs and they can create more difficulties accessing mental health care services for their children. For example, a study conducted in the US (Hamblin, 2016) found that when college students were asked which of their parents encouraged them to seek mental health therapy help, 47% of them said that their mothers were the ones behind these decisions while 5% said they were pushed by their fathers to seek help. The parents’ absence, unwell mental/physical health and unawareness of the children’s mental health needs can cause them many difficulties in accessing mental health services. Altogether, the children’s well-being is dependent on their parents’ health. Children with or without mental health issues are always in need of their parents. If the parents neglect their children, they will be less likely to look for resources to help alleviate their children’s mental health issues.

CHAPTER 3: Methods

The purpose of this study was to examine difficulties in accessing mental health care services among children with depression/anxiety and ASD/ADD/ADHD. It also aims to investigate the associated barriers, and challenges, which prohibit children with these mental health issues from accessing the health care services they need. This chapter describes the methodology of the study, which includes the research design, data description, study sample, measures, and statistical analysis.

Research design

In this study, a secondary data analysis was performed using cross-sectional data from the 2017-2018 National Survey of Children's Health (NSCH). The NSCH was designed to provide information about children's physical, psychological, and mental health residing in the United States. The survey includes a variety of information and various topics about children ages 0-17 years old (The 2017-18 National Survey of Children's Health (NSCH) Combined Data Set FAST FACTS, 2019).

Data Description

The data set represents a national, random, and cross-sectional survey of children ages 0-17 years old. The participant in the survey was an adult, either parent, caregiver, or households who lived with the child and part of the family and aware of child's health, his/her need for health care services, and the medical services which were provided to the

child. Using the address information, a total of 176,000 families who were living in all 50 states of the U.S and the District of Columbia, were chosen to be in the sample.

The NSCH was conducted through online and mail instruments using administrative information to determine families with children age 17 years old or younger across the United States (The 2017-18 National Survey of Children's Health (NSCH) Combined Data Set FAST FACTS, 2019; 2018 National Survey of Children's Health (NSCH) Sampling and Survey Administration, 2019). The main source of support for the survey was the Health Resources and Services Administration's Maternal and Child Health Bureau (HRSA MCHB). After identifying the households, the survey was sent to the respondent's address via e-mail and mail to fill the screening questionnaire about the children's age, sex, race, and housing and family status, etc. When the householders completed the survey, the selection was made randomly for one child from each family to be included in the "Topical Questionnaire" as the survey's topic. Further information about the respondents and survey methodology can be found elsewhere (The U.S. Census Bureau, Methodology Report, 2019).

For the 2017 and 2018 year, the combined data set intended for children ages 0-17 years old included 52,129 children (21,599 in 2017, and 30,530 in 2018). The collected data included different types of information, such as health topics and other characteristics related to children, their families, their neighbors, and community. For instance, it included data about child's mental, emotional, memory, concentration, physical conditions, chronic diseases, health care services, height and weight, developmental concerns and screening, usual source of care, vision testing, forgone health care, emergency room use, educational

and developmental services, and insurance coverage. Moreover, it covered various information about the family, caregiver, and household, such as number of family members, smoking status, income, financial assistance, level of education, their overall health, housing, and ability to cover basic needs like foods. Additionally, it contained information about the neighborhood and how they helped each other out, and about their community; how safe it was and availability of facilities (The U.S. Census Bureau, Topical Variable List, 2019).

Study Sample

The sample of this study included children under 18 years old with depression/anxiety, and ASD/ADD/ADHD conditions. The total sample size for this study for the regression models included 6,194 of which 3,520 had anxiety/depression and 2,674 had ASD/ADD/ADHD. While the sample size of the study for the classification trees models consisted of 5,892; 3,348 children with anxiety/depression, and 2,544 children with ASD/ADD/ADHD.

The survey questions that were used to identify only those with anxiety/depression included “Has a doctor or other health care provider EVER told you that this child has: anxiety problems? And Has a doctor or other health care provider EVER told you that this child has depression?” Due to the small number of observations for each condition, a new variable called anxiety/depression was created based on these questions.

Then, the subsample that included only children with ASD/ADD/ADHD was created based on the questions: “Has a doctor or other health care provider EVER told you that this child has Autism or Autism Spectrum Disorder (ASD)?”, and “Has a doctor or other health care provider EVER told you that this child has Attention Deficit Disorder or

Attention Deficit/Hyperactivity Disorder, that is, ADD or ADHD?” Moreover, another variable that combined all three conditions named ASD/ADD/ADHD was generated. Missing data for the independent variables ranged from 0 to 1% while the dependent variable ranged from 4% to 5%.

Measures

Dependent variable

The outcome variable of this study was a binary, namely whether the children or their families had difficulties in accessing mental health care services. The survey question that was used to build the dependent variable was as follows “ How difficult was it to get the mental health treatment or counseling that this child needed?”, which has categorized into two groups difficult and not difficult. A variable was generated from these responses that included a category of “yes” for having difficulty obtaining needed health treatment and a “no” category if they responded as having no difficulty.

Independent measures

This study used the Andersen Behavioral Healthcare Utilization Model (Andersen, 1995; Karpur et al., 2019; Moonesar, 2015), which is a framework for access and use of health care services. The independent measures consist of three components which include: predisposing factors, enabling factors, and need factors. The predisposing factors included demographic and social structure characteristics of children. The enabling factors included the personal/family and community resources, which are associated with access to health care services while the need factors state the actual and perceived need for mental health care services.

Predisposing Factors

The Predisposing Factors assessed in this study included child's age 0-17 years old; which was divided into three categories 0-5, 6-11, and 12-17. Sex was binary male and female. Race/Ethnicity included the four categories, namely Hispanic, White non-Hispanic, Black non-Hispanic, and other/ multi-racial-non-Hispanic. The primary spoken language was classified into English and other than English. Family structure was categorized into five categories: two-parent household (currently married), two-parent (not currently married), single parent (mother or father), grandparent household, and other family types. The number of family members were divided into three categories that included, 1-3 people, four people, ≥ 5 people. The number of children in households was classified into three groups, one child, two children, and at least three children). Parental education level included, less than high school, high school, some college or associate degree, and college degree or higher.

Enabling Factors

Problems paying for medical/health care bills were separated into three categories, namely no medical bills, had problems paying medical bills, and did not have problems paying medical bills. The federal poverty level (FPL) was constructed by the Health Resources and Services Administration's Maternal and Child Health Bureau (HRSA MCHB) into four groups based on income, 0-199 FPL, 200-299 FPL, 300-399 FPL, and 400 FPL or greater. Out-of-pocket costs for health care were divided into three categories, no medical expenses/ less than \$250, \$250-\$999, and \$1000-\$5000 or more. The measure related to people in the neighborhood helping each other out was classified into three groups: definitely agree, somewhat agree, and disagree.

Adverse childhood experiences were categorized into: none, experienced one and experienced at least two. Health insurance coverage was classified into three groups, namely had insurance, had a gap in coverage, and did not have any health insurance coverage. Type of health insurance was categorized into public, private, public and private, and uninsured. Adequacy of insurance coverage for mental/behavioral health care was classified into three categories that included did not receive mental health services, always/usually, sometimes/never. Adequate and continuous insurance was categorized as adequate and continuous and inadequate and/or had a gap in insurance.

Need Factors

Behavioral problems (Oppositional Defiant Disorder (ODD) and Conduct Disorder) were classified into yes/no. Developmental delay, such as cognitive delay, social, and emotional delay were also classified into; yes/no. Other mental health conditions were categorized as yes/no. Prematurity was divided into yes/no. Special care need services more than usual was divided into yes/no. Special treatment for emotional/developmental behavior was recorded as yes/no. Intellectual disability (communication and learning) was categorized as yes/no. The mother's and father's overall physical/mental health status was classified into three categories, physical & mental health were both excellent, one or both of physical & mental health were excellent , and no biological, adoptive, step or foster.

Statistical Analysis

Data were preprocessed and weighted to account for the complex survey design of NSCH. To assess children's characteristics and their families, weighted descriptive analyses of the analytic sample were performed to generate frequency distributions of sociodemographic and health-related characteristics for both groups of children, namely

those with anxiety/depression and ASD/ADD/ADHD, separately. Weighted bivariate analyses were conducted to examine any significant associations between difficulties in accessing mental health care services and children's characteristics, stratified by anxiety/depression and ASD/ADD/ADHD. In multivariable analysis, a binary multiple logistic regression model was built separately for anxiety/depression and for those children with ASD/ADD/ADHD in order to assess the influence of children's characteristics on mental health care services. The odds ratio with 95 % confidence intervals were computed, and results were considered statistically significant at a significance level of 0.05. The STATA 16 software was used in conducting statistical analysis for logistic regression (StataCorp, 2020). Moreover, for the same data two decision trees were built using data mining techniques, specifically in the Python environment (Jupyter Notebook) to analyze the data and assess the risk factors. Factors that were tested as possible risk factors were selected based on statistically significant associations that were generated from the bivariate analyses. Moreover, the same factors were used in constructing the classification trees in order to compare the findings to those of the logistic regression models.

CHAPTER 4: Results

The purpose of this study was to examine difficulties in accessing mental health care services among children with depression/anxiety and ASD/ADD/ADHD. This study also assessed factors that may place these children at higher risk for accessing mental health care services using logistic regression models and classification trees. This chapter presents the results of the study which include descriptive statistics of the sample characteristics, bivariate associations between difficulties in accessing mental health services and sample characteristics based on whether the children suffer from depression/anxiety or ASD/ADD/ADHD, and finally binary multiple logistic regression analyses, and classification trees for both groups of children to identify risk factors associated with difficulties in obtaining mental health services.

Sample Characteristics

Table 1 shows the distribution of weighted sample characteristics among U.S children with anxiety/depression and ASD/ADD/ADHD. In both groups, more than half of the sample consisted of 12-17 years old, followed by 6-11 years old children at about 35% and finally 0-5 years old children who represent the smallest group with less than 6%. The highest proportion of anxiety/depression was observed at 59.7% in 12-17 year old children followed by 6-11 year old children (35.1%) and only 5.5% for children ages 0-5 years old. Similarly, for the children with ASD/ADD/ADHD, around half of the sample were 12-17

years old (51.3%), 43.2% were 6-11 years old, 5.5% were five years old or younger. Overall, 50.7% of the children with anxiety/depression were female while 49.3% were male. However, the majority of children with ASD/ADD/ADHD were male with 70.4%.

More than 50% of the white non-Hispanic children and more than 20% of the Hispanic children suffered from mental health conditions. The primary language spoken at home for all children in all two groups was English (90%) and only less than 10% spoke other languages. Around 34.5% of children with anxiety/depression and 49.2% of children with ASD/ADD/ADHD had behavioral problems. The majority of children in two groups did not have developmental delay problems, however, around 24.5% of children with anxiety/depression and about 33.2% of children with ASD/ADD/ADHD were diagnosed with other mental health conditions. Most of the children in the two groups were born with a normal birthweight and were not preterm. Nevertheless, 14.9% of children with anxiety/depression, and 17% with ASD/ADD/ADHD were born 3 or more weeks before their due date.

Moreover, 19.8% of the sample with anxiety/depression had problems paying the medical bills while 15.5% of the children with ASD/ADD/ADHD had this issue. More than 40% of both groups of children lived in households classified at 0-199 FPL and over 25% lived at 400 FPL or greater. For the number of family members, living in a household, we observe that about 36.2% of children with anxiety/depression lived with at least three individuals in the household and about 64% of them lived with four or more. Likewise, 34.7% of children who had ASD/ADD/ADHD lived with at least three people in their

homes, 30.2% lived with four people, and about 35.1% lived with more than four. The majority of children in both groups lived in households with two children.

Furthermore, for the out-of-pocket costs for child's health care, 47.7% of children with anxiety/depression had no medical or health expenses or they spent less than \$250; 28.8% paid between \$250 to \$999 for medical care, and about 23.5% paid \$1000 or more. For children with ASD/ADD/ADHD, 55.8% had no medical or health care expenses or they spent less than \$250, 23.5% paid between \$250 to \$999 for medical care, and 20.7% paid \$1000 or more.

About 48% of the children lived in a community where people in the neighborhood somewhat agreed to help each other out while about 20% disagreed. Approximately, 48% of the children with anxiety/depression and about 56% with ASD/ADD/ADHD needed special care services more than usual. Special treatment for emotional developmental behavior was needed by about 55% of the children in both groups. Less than 8% of the children in both groups were diagnosed with an intellectual disability. Approximately 42% of the children with anxiety/depression and 39% of those with ASD/ADD/ADHD experienced at least two adverse childhood experiences.

Regarding parental education level, a high percentage of parents completed college degrees or obtained higher levels of education. Almost 46.4% of parents of children with anxiety/depression had a college degree or higher, and 24.7% of them had some college or associate degree while 19.9% had high school and only 9% had less than high school. Similar patterns observed for the ASD/ADD/ADHD group.

Approximately 50.3% children with anxiety/depression had mothers with either excellent physical health and/or mental health while 43.4% of children with ASD/ADD/ADHD had mothers with either excellent physical health and/or mental health. On the other hand, only 36% of children with anxiety/depression had fathers in both excellent physical & mental health, and this was true for 38% of the fathers for ASD/ADD/ADHD children.

Regarding family structure, more than 50% of children in both groups were living with two parents who currently are married, followed by living with single parent (mother or father) (more than 26%). Concerning health insurance coverage, the majority of the sample had insurance coverage. Almost 50% of the sample had a private health insurance and only less than 5% were uninsured. The results show that about 50% of the children in both groups had always/usually adequate insurance for mental/behaviors health care while more than 13% had sometimes/never. Lastly, 56.9% of the children with depression/anxiety and 64.1% of those with ASD/ADD/ADHD had adequate and continuous health insurance coverage.

Table 1. Distribution of sample characteristics

Characteristics	Children with Anxiety/ Depression Weighted % (SE)	Children with ASD/ADD/ADHD Weighted % (SE)
Predisposing factors		
Age (in year)		
0-5	5.2 (0.01)	5.5 (0.01)
6-11	35.1 (0.01)	43.2 (0.01)
12-17	59.7 (0.01)	51.3 (0.01)
Sex		
Male	49.3 (0.01)	70.4 (0.01)
Female	50.7 (0.01)	29.6 (0.01)
Race/ethnicity		
Hispanic	22.0 (0.02)	23.0 (0.02)
White; non-Hispanic	59.4 (0.02)	52.7 (0.01)
Black; non-Hispanic	10.8 (0.01)	16.7 (0.01)

Other/multi-racial; non-Hispanic	7.8 (0.01)	7.7 (0.01)
Primary spoken language		
English	91.0 (0.01)	93.1 (0.01)
Other than English	9.0 (0.01)	6.9 (0.01)
Family structure		
Two parents, currently married	56.3 (0.01)	53.8 (0.01)
Two parents, not currently married	8.7 (0.01)	10.5 (0.01)
Single parent (mother or father)	27.1 (0.01)	26.5 (0.01)
Grandparent household	5.5 (0.01)	6.9 (0.01)
Other family type	2.4 (0.00)	2.3 (0.00)
No	77.7 (0.01)	67.6 (0.01)
Number of family members		
1 or 2 or 3 People	36.2 (0.01)	34.7 (0.01)
4 People	32.3 (0.01)	30.2 (0.01)
5 or 6 or More People	31.6 (0.01)	35.1 (0.02)
Number of Children in household		
1 child	31.1 (0.01)	28.4 (0.01)
2 children	37.5 (0.01)	36.7 (0.01)
3 or more children	31.4 (0.01)	34.9 (0.01)
Parental education level		
Less than high school	9.0 (0.01)	9.6 (0.01)
High school	19.9 (0.01)	23.2 (0.01)
Some college or Associate Degree	24.7 (0.01)	24.7 (0.01)
College degree or higher	46.4 (0.01)	42.5 (0.01)
Did not have problems paying medical bill	49.1 (0.01)	46.0 (0.01)
Enabling Factors		
Poverty level		
0-199 FPL	43.5 (0.01)	48.1 (0.01)
200-299 FPL	15.2 (0.01)	14.7 (0.01)
300-399 FPL	11.9 (0.01)	9.8 (0.01)
400 FPL or greater	29.3 (0.01)	27.5 (0.01)
Out-of-pocket costs for child's health care		
No medical or health care expenses or less than \$250	47.7 (0.01)	55.8 (0.01)
\$250 - \$999	28.8 (0.01)	23.5 (0.01)
\$1000- \$5000 or More	23.5 (0.01)	20.7 (0.01)
Problems paying for child's medical/health care bill		
No medical bills	31.1 (0.01)	38.5 (0.02)
Had problems paying medical bills	19.8 (0.01)	15.5 (0.01)
Did not have problems paying medical bill	49.1 (0.01)	46.0 (0.01)
Adverse childhood experiences		
None	32.2 (0.01)	37.3 (0.01)
Experienced one	26.1 (0.01)	23.7 (0.01)
Experienced at least two	41.7 (0.01)	39.0 (0.01)
Health insurance coverage		
Yes	91.3 (0.01)	92.1 (0.01)
Had a gap in coverage	4.8 (0.01)	4.7 (0.01)
None	3.9 (0.01)	3.2 (0.00)
Type of health insurance		
Public	34.4 (0.01)	39.7 (0.02)
Private	51.8 (0.01)	46.7 (0.01)
Public and private	8.1 (0.01)	8.6 (0.01)
Uninsured	5.8 (0.01)	5.0 (0.01)
Adequacy of insurance coverage for mental/ behavioral health care		
Did not receive mental health services	34.5 (0.01)	36.1 (0.01)
Always/ usually	50.3 (0.01)	50.9 (0.01)
Sometimes/ never	15.3 (0.01)	13.1 (0.01)

Adequate and continuous insurance		
Adequate and continuous	56.9 (0.01)	64.1 (0.01)
Inadequate and/or had gap in insurance cover	43.1 (0.01)	35.9 (0.01)
People in neighborhood help each other out		
Definitely agree	31.5 (0.01)	30.4 (0.01)
Somewhat agree	48.3 (0.01)	48.5 (0.01)
Disagree	20.3 (0.01)	21.1 (0.01)
Need Factors		
Other mental health conditions		
Yes	24.5 (0.01)	33.2 (0.01)
No	75.5 (0.01)	66.8 (0.01)
Behavioral problems		
Yes	34.5 (0.01)	49.2 (0.01)
No	65.5 (0.01)	50.8 (0.01)
Developmental delay		
Yes	22.3 (0.01)	32.4 (0.01)
No	77.7 (0.01)	67.6 (0.01)
Intellectual Disability		
Yes	4.9 (0.01)	7.6 (0.01)
No	95.1 (0.01)	92.5 (0.01)
Prematurity		
Yes	14.9 (0.01)	17.0 (0.01)
No	85.1 (0.01)	83.0 (0.01)
Special care need services more than usual		
Yes	47.8 (0.01)	56.0 (0.01)
No	52.2 (0.01)	44.0 (0.01)
Special treatment for emotional developmental behavior		
Yes	54.1 (0.01)	55.5 (0.01)
No	45.9 (0.01)	44.5 (0.01)
Mother's overall physical/mental health status		
Physical & mental health both excellent	37.7 (0.01)	44.3 (0.01)
One or both of physical & mental health excellent	50.3 (0.01)	43.4 (0.01)
No biological, adoptive, step or foster	12.0 (0.01)	12.3 (0.01)
Father's overall physical/mental health status		
Physical & mental health both excellent	36.0 (0.01)	38.0 (0.01)
One or both of physical & mental health excellent	29.3 (0.01)	26.0 (0.01)
No biological adoptive, step or foster	34.7 (0.01)	36.0 (0.01)

Note: SE – Standard Errors

FPL: Federal Poverty Level

*The analysis was weighed to account for the complex design of National Survey of Children's Health (NSCH).

Associations between difficulties in accessing mental health care and children's characteristics

Table 2 presents findings of weighted associations between difficulties in accessing mental health care and children's characteristics across the two groups of children suffering from anxiety/depression and ADD/ADHD/ASD.

Children with Anxiety/Depression

For children with anxiety/depression, the findings displayed in Table 2 show that there is a significant association between having behavioral problems and difficulties in getting access to mental care (P-value = 0.000). Approximately, 54% of children with behavioral problems had difficulty accessing mental health care services. Similarly, a significantly higher percent of children with developmental delays (55.3%) (P-value = 0.002) and other mental health conditions (52.6%) (p-value = 0.009) had difficulty accessing mental health care.

Furthermore, children from families not being able to afford paying for child's medical/ health care bills (67%) were significantly more likely not being able to get access to the mental health care services. Moreover, children who resided in communities where neighbors did not help each other out were more likely to report difficulties in getting mental health care services (P-value = 0.001). In Addition, children with anxiety/depression who needed special care more than usual or more than other children were significantly more likely (49.3%) to not get all health care services needed. Similarly, 49% of the children who needed special treatment for emotional/developmental behavior had a hard time getting access to mental health care (P-value = 0.001). In addition, there was a notable significant relationship between the experiencing adverse childhood experiences and challenges in obtaining mental health care services (P-value = 0.000).

Lower parental education level was significantly associated with difficulties in accessing mental health care (P-value = 0.042). Children with parents who had some college or associate degree and those who had college degree or higher (50.4% and 48.9%, respectively) were less likely to have difficulties in accessing mental health care services.

Good/excellent parental physical/mental health was significantly associated with a higher likelihood of obtaining mental health care services. Additionally, a high percentage of children who had inadequate and/or had a gap in health insurance coverage (56.2%) were more likely to have difficulties in accessing mental health care (P-value = 0.000).

For this group of children, other significant associations were observed between difficulties in accessing mental health care services and age, sex, race/ethnicity, and primary spoken language (p-value \leq 0.05). No significant associations were observed between difficulties accessing mental health care and the following measures, including prematurity, poverty level, number of family member, number of children in households, out-of-pocket costs for health care, intellectual disability, family structure, health insurance coverage, and health insurance coverage.

Children with ASD/ADD/ADHD

Table 2 displays associations between difficulties in accessing mental health care services and children's characteristics among those with ASD/ADD/ADHD. Younger children with ASD/ADD/ADHD were significantly more likely to experience difficulties in obtaining mental care services (P-value = 0.045). Also, children who had behavioral problems (P-value = 0.007) and mental health conditions (P-value = 0.011) were significantly more likely to have difficulties in accessing mental health care. For example, 53.9% of children with ASD/ADD/ADHD who have other mental condition had difficulty obtaining mental health services when needed.

Moreover, children whose parents had difficulty paying medical bills, children had difficulty obtaining mental health care services (69.8%) (P-value = 0.000). Further, adverse childhood experiences among children with ASD/ADD/ADHD were significantly

associated with difficulties in accessing mental health care services. Specifically, 55.2% of children who experienced two or more childhood experiences had difficulty accessing mental health care services when needed (P-value = 0.003). Also, there was a significant association between adequacy and continuity of health insurance coverage with obtaining mental health care services, especially the one for mental/behavioral health care (P-value = 0.000).

No significant associations were found between difficulties in accessing mental health care among children with ASD/ADD/ADHD and prematurity, number of family members, and family structure, sex, race/ethnicity, primary spoken language, developmental delay, poverty level, number of children in household, out-of-pocket costs for health care, whether people in neighborhood help each other out, special care need services more than usual, special treatment for emotional/ developmental behavior, intellectual disability, parental education level, health insurance coverage, and type of health insurance.

Table 2. Weighted bivariate associations between difficulties in accessing mental health care and children’s characteristics

Characteristics	Children with Anxiety/Depression			Children with ASD/ADD/ADHD		
	Not Difficult Weighted %	Difficult Weighted%	P-value	Not Difficult Weighted %	Difficult Weighted%	P-value
Predisposing factors						
Age (in years)			0.076			0.045
0-5	35.8	64.2		32.6	67.4	
6-11	53.7	46.3		50.7	49.3	
12-17	54.5	45.5		54.3	45.7	
Sex			0.443			0.971
Male	52.2	47.8		51.7	48.3	
Female	54.7	45.3		51.5	48.5	
Race/Ethnicity			0.081			0.083
Hispanic	51.9	48.1		44.5	55.5	
White; non-Hispanic	56.9	43.1		57.0	43.0	
Black; non-Hispanic	43.8	56.2		46.7	53.3	

Other/multi-racial; non-Hispanic	46.7	53.3	47.9	52.1
Primary spoken language			0.133	0.355
English	52.4	47.6	52.1	47.9
Other than English	66.1	33.9	39.0	61.0
Family structure			0.291	0.646
Two parents, currently married	55.7	44.3	49.9	50.1
Two parents, not currently married	52.2	47.8	49.6	50.4
Single parent (mother or father)	49.5	50.5	51.7	48.3
Grandparent household	59.9	40.1	53.5	46.5
Other family type	43.5	56.5	68.1	31.9
Number of family members			0.680	0.120
1 or 2 or 3 People	54.2	45.8	56.8	43.2
4 People	51.6	48.4	48.5	51.5
5 or 6 or More People	55.0	45.0	48.0	52.0
Number of children in household			0.779	0.290
1 child	54.9	45.1	55.9	44.1
2 children	52.2	47.8	51.5	48.5
3 or more children	53.7	46.3	48.0	52.0
Parental Education Level			0.042	0.264
Less than high school	68.5	31.5	57.9	42.1
High school	58.0	42.0	57.6	42.4
Some college or associate degree	49.6	50.4	46.5	53.5
College degree or higher	51.1	48.9	50.0	50.0
Enabling Factors				
Poverty level			0.087	0.484
0-199 FPL	51.3	48.7	49.1	50.9
200-299 FPL	49.4	50.6	53.1	46.9
300-399 FPL	51.7	48.3	51.9	48.1
400 FPL or greater	59.3	40.7	55.2	44.8
Out-of-pocket costs for health care			0.213	0.219
No medical or health care expenses or less than \$250	56.1	43.9	54.2	45.8
\$250 - \$999	52.4	47.6	49.7	50.3
\$1000- \$5000 or More	49.7	50.3	47.0	53.0
Problems paying for child's medical/ health care bills			0.000	0.000
No medical or health-related expenses	54.8	45.2	52.5	47.5
Had problems paying medical bills	33.0	67.0	30.2	69.8
Did not have problems paying medical bill	63.0	37.0	60.5	39.5
Adverse childhood experiences			0.000	0.003
None	60.2	39.8	54.4	45.6
Experienced one	60.9	39.1	61.3	38.7
Experienced at least two	46.3	53.7	44.8	55.2
Health insurance coverage			0.593	0.087
Yes	54.3	45.7	53.1	46.9
Had a gap in coverage	46.5	53.5	32.3	67.7
None	45.6	54.4	45.2	54.8
Type of health insurance			0.486	0.253
Public	52.4	47.6	49.9	50.1
Private	56.2	43.8	54.9	45.1
Public and private	46.7	53.3	50.4	49.6
Uninsured	47.9	52.1	36.3	63.7

Adequacy of insurance coverage for mental/behavioral health care			0.000		0.000
Did not receive mental health services	47.3	52.7		41.9	58.1
Always/ usually	61.1	38.9		59.3	40.7
Sometimes/ never	30.8	69.2		28.1	71.9
Adequate and continuous insurance			0.000		0.000
Adequate and continuous	61.1	38.9		58.7	41.3
Inadequate and/or had gap in insurance cover	43.8	56.2		40.1	59.9
People in neighborhood help each other out			0.001		0.496
Definitely agree	61.5	38.5		54.6	45.4
Somewhat agree	53.2	46.8		51.7	48.3
Disagree	43.8	56.2		47.7	52.3
Need Factors					
Other mental health conditions			0.009		0.011
Yes	47.4	52.6		46.1	53.9
No	56.6	43.4		56.4	43.6
Behavioral problems			0.000		0.007
Yes	45.8	54.2		46.8	53.2
No	59.2	40.8		59.8	40.2
Developmental delay			0.002		0.079
Yes	44.7	55.3		47.0	53.0
No	56.6	43.3		54.2	45.8
Intellectual Disability			0.081		0.211
Yes	42.2	57.8		44.6	55.4
No	54.2	45.8		52.2	47.8
Prematurity			0.165		0.559
Yes	47.9	52.1		54.2	45.8
No	54.3	45.7		51.4	48.6
Special care need services more than usual			0.031		0.113
Yes	50.7	49.3		49.7	50.3
No	57.9	42.1		56.8	43.2
Special treatment for emotional/ developmental behavior			0.007		0.328
Yes	51.0	49.0		50.5	49.5
No	61.4	38.6		55.8	44.2
Mother's overall physical/ mental health status			0.006		0.501
Physical & mental health both excellent	59.7	40.3		52.8	47.2
One or both of physical & mental health excellent	49.1	50.9		49.0	51.0
No biological, adoptive, step or foster	57.6	42.4		55.2	44.8
Father's overall physical/ mental health status			0.004		0.790
Physical & mental health both excellent	61.4	38.6		50.3	49.7
One or both of physical & mental health excellent	50.7	49.3		50.5	49.5
No biological, adoptive, step or foster	49.5	50.5		53.1	46.9

Note: Alpha = 0.05

FPL: Federal Poverty Level

*The analysis was weighed to account for the complex design of National Survey of Children's Health (NSCH).

The effects of children's characteristics and their families on difficulties in accessing mental health services

Table 3 presents the results from the binary multiple logistic regression models in assessing the effects of children's characteristics and their families on difficulties in accessing mental health care across the two different groups.

For race/ethnicity, Hispanic children with ASD/ADD/ADHD were significantly more likely to have trouble in accessing mental health care services compared to their white counterparts. Similarly, compared to white, Black, non-Hispanic significantly were more likely to have difficulty in accessing mental health care in both groups of children. Furthermore, in both groups, compared to children whose health insurance was adequate and continuous, children without adequate and continuous health insurance coverage were significantly more likely to have difficulties in meeting their mental health needs.

Moreover, compared to children residing in households who did not have problems paying medical bills groups, those who had problems paying medical bills were significantly ($p\text{-value} < 0.001$) more than twice as likely to have difficulties in obtaining mental health care services. This finding was true for both groups of children. In addition, compared to children who did not experience adverse childhood experiences in both groups, children who experienced at least two adverse childhood experiences were significantly more likely ($p\text{-value} < 0.05$) to have difficulty in accessing mental health care services.

Furthermore, among children with ASD/ADD/ADHD, those who had other mental health conditions were significantly more likely to have difficulties in accessing mental health care services (OR =1.48; CI 1.08,2.02) compared to those with no other mental

health conditions. Regarding children with depression/anxiety who live in a community where people disagreed to help each other out, were 1.55 (1.03, 2.33) times more likely to have difficulty accessing mental care services compared to those children living in communities where people help each other.

Additionally, among children with ASD/ADD/ADHD, those who lived with a father whose physical and mental health excellent/very good were 1.77 (1.11,2.82) times more likely to face difficulties in accessing mental health care services compared to those who did not live with a biological/adoptive/step or foster father. Moreover, children with anxiety/depression with behavioral problems were 1.41(1.04,1.93) times more likely to have difficulties accessing mental health care services than those with no behavioral problems.

The area under the ROC curve for the logistic regression model for children with anxiety/depression was 0.674 (Figure 3). The ROC curve was 0.686 for children with ASD/ADD/ADHD model, as shown in Figure 4.

Table 3. Logistic regression and Odds Ratios for weighted analysis of difficulties in accessing mental health care among children

Characteristics	Children with Anxiety/Depression and have difficulties in accessing mental health care they need N = 3,520		Children with ASD/ADD/ADHD and have difficulties in accessing mental health care they need N = 2,674	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Predisposing factors				
Age (in years)				
0-5	1.73(0.90,3.34)	0.101	2.02(0.96,4.25)	0.064
6-11	0.84(0.63,1.12)	0.238	1.06(0.76,1.48)	0.726
12-17	Reference		Reference	
Sex				
Female	1.02(0.78,1.33)	0.864	0.99(0.72,1.36)	0.945
Male	Reference		Reference	
Race/Ethnicity				
Hispanic	1.24(0.83,1.85)	0.302	1.95(1.19,3.17)	0.007
White, non-Hispanic	Reference		Reference	
Black, non-Hispanic	1.82(1.11,3.00)	0.019	1.72(1.09,2.71)	0.020
Other/Multi-racial, non-Hispanic	1.33(0.83,2.12)	0.230	1.53(0.97,2.44)	0.069
Enabling Factors				

Poverty level				
0-199 FPL	0.76(0.5541,0.09)	0.136	0.94(0.60,1.48)	0.803
200-299 FPL	1.02(0.68,1.53)	0.908	0.84(0.53,1.33)	0.466
300-399 FPL	1.01(0.65,1.57)	0.965	0.83(0.51,1.36)	0.457
400 FPL or greater	Reference		Reference	
Problems paying for child's medical/ health care bills				
No medical or health-related expenses	1.26(0.87,1.84)	0.222	1.35(.88,2.08)	0.169
Had problems paying medical bills	2.48(1.75,3.50)	0.000	2.71(1.78,4.12)	0.000
Did not have problems paying medical bills	Reference		Reference	
Adverse childhood experiences				
No adverse childhood experiences	Reference		Reference	
Experienced 1 adverse childhood experience	0.88(0.61,1.27)	0.497	0.80(0.50,1.28)	0.349
Experienced 2 or more adverse childhood experiences	1.50(1.05,2.13)	0.026	1.66(1.06,2.62)	0.028
Adequate and continuous insurance				
Current insurance is adequate and continuous	Reference		Reference	
Current insurance is inadequate and/or had gap in insurance cover	1.66(1.23,2.24)	0.001	1.83(1.27,2.63)	0.001
People in neighborhood help each other out				
Definitely agree	Reference		Reference	
Somewhat agree	1.30(0.97,1.74)	0.081	0.96(0.67,1.38)	0.818
Disagree	1.55(1.03,2.33)	0.034	0.98(0.60,1.61)	0.944
Need Factors				
Other mental health conditions				
Yes	1.11(0.82,1.51)	0.502	1.48(1.08,2.02)	0.015
No	Reference		Reference	
Behavioral problems				
Yes	1.41(1.04,1.93)	0.029	1.43(0.99,2.08)	0.060
No	Reference		Reference	
Developmental delay				
Yes	1.24(0.89,1.73)	0.207	1.04(0.74,1.46)	0.819
No	Reference		Reference	
Special care need services more than usual				
Yes	1.03(0.76,1.39)	0.873	1.01(0.69,1.49)	0.955
No	Reference		Reference	
Special treatment for emotional/ developmental behavior				
Yes	1.10(0.78,1.55)	0.599	0.85(0.54,1.33)	0.470
No	Reference		Reference	
Mother's overall physical/ mental health status				
Physical & mental health BOTH excellent or very good	1.29(0.81,2.05)	0.282	1.04(0.61,1.77)	0.892
One or both of physical & mental health are NOT excellent/very good	1.30(0.84,2.02)	0.241	1.02(0.64,1.64)	0.921
No biological, adoptive, step or foster mother in household	Reference		Reference	
Father's overall physical/ mental health status				
Physical & mental health BOTH excellent or very good	0.89(0.61,1.29)	0.530	1.77(1.11,2.82)	0.016
One or both of physical & mental health are NOT excellent/very good	1.07(0.75,1.54)	0.700	1.36(0.90,2.06)	0.140
No biological, adoptive, step or foster father in household	Reference		Reference	

Note: Alpha = 0.05

FPL: Federal Poverty Level

N: Sample size

OR - Odds ratio; 95% CI – 95% Confidence Interval

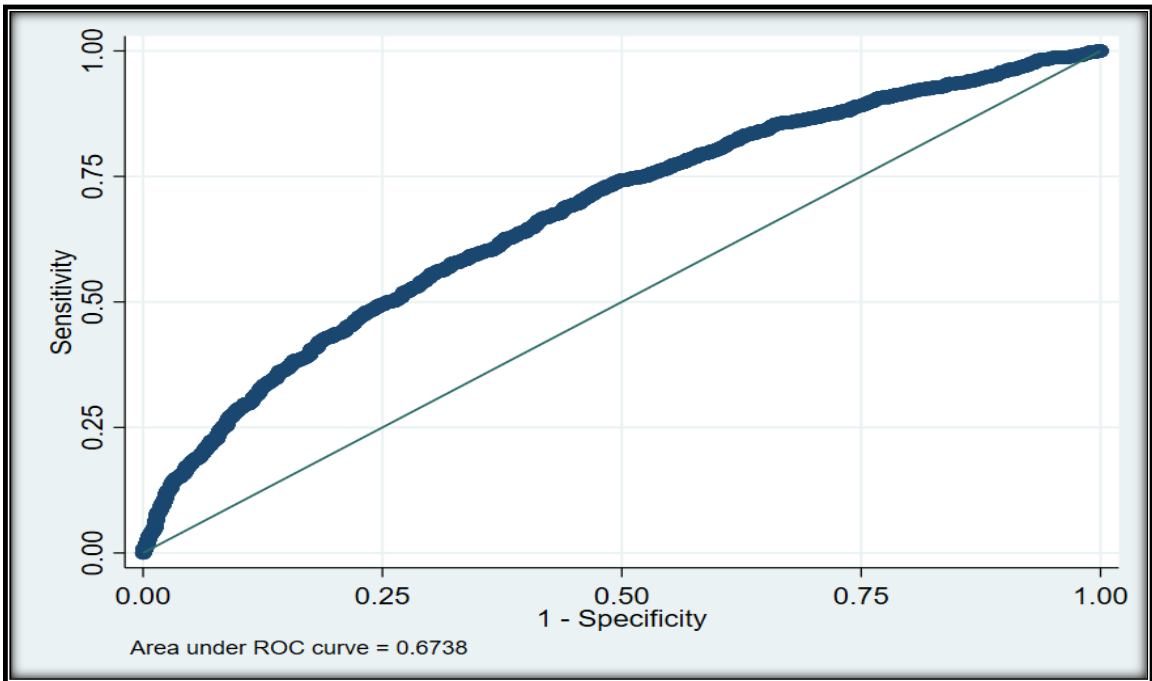


Figure 3. The ROC curve for children with anxiety/depression model

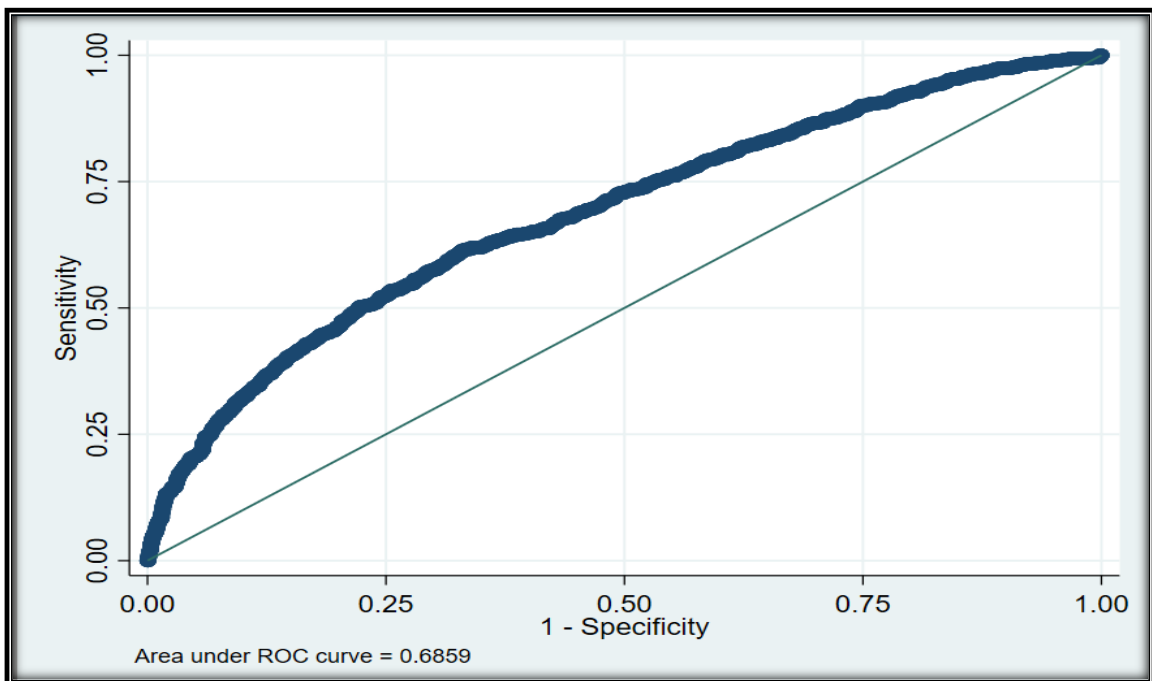


Figure 4. The ROC curves for children with ASD/ADD/ADHD model

Classification tree analyses for children with anxiety/depression

The classification tree for children with anxiety/depression is presented in Figure 5. The classification tree analysis for children with anxiety/depression indicates that health insurance adequacy is the most important variable followed by problems with paying medical bills, behavioral problems, needed more special care services than usual, neighborhood help, and mother's overall health.

In children with anxiety/depression, 46% of children who needed more special care services, were diagnosed with behavioral problems, and their current health insurance was adequate and continuous had difficulties in accessing mental health services (terminal node 8). About 36% of children who had behavioral problems but did not need more services whose health insurance coverage was adequate and continuous face difficulties in obtaining mental health care services (terminal node 7).

The tree's left branch classified children whose health insurance coverage was inadequate and/or had a gap in insurance, which was divided further by the parents' ability to pay medical/health bills for their children. Among children who have inadequate and/or had a gap in their health insurance and did not have problems paying medical bills, and needed more special care services than usual had a higher likelihood of not accessing mental health services (54%) (terminal node 4).

In this left side of the classification tree, 70% of children whose mother's (or other female guardian) overall physical/mental health was not excellent/very good, had no medical health expenses or had problems paying medical/health-related bills could not access mental health services (terminal node 1). Similarly, about 51% of children with anxiety/depression children whose mother's (or other female guardian) overall

physical/mental health were both excellent/very good , had no medical health expenses or had problems paying medical/health-related bills their current health insurance was inadequate and/or had a gap had difficulties in getting mental health care services (terminal node 2). The ROC Score of the predictive model was 0.64.

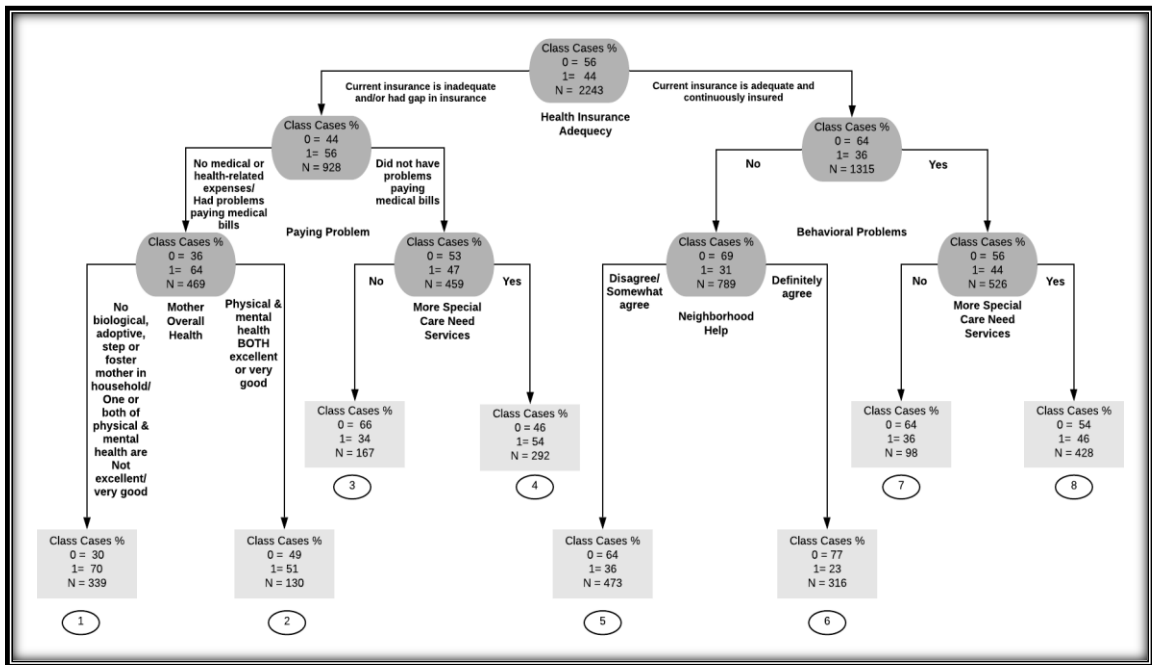


Figure 5. Classification tree for children with anxiety/depression

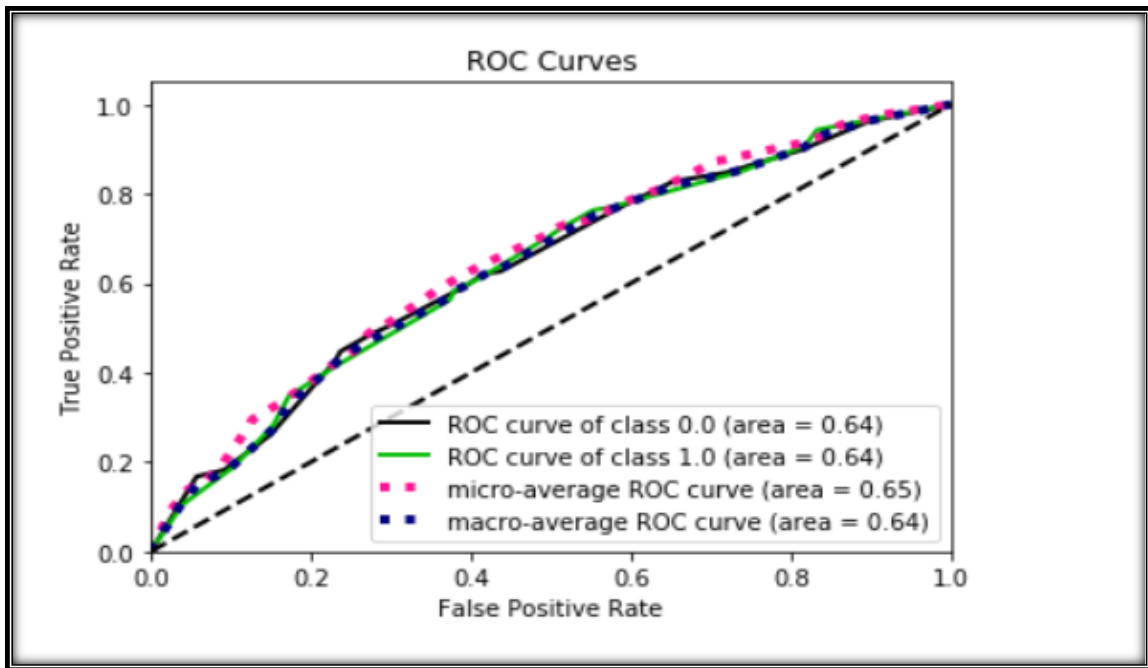


Figure 6. The ROC curve for anxiety/depression predictive model

Classification tree analyses for children with ASD/ADD/ADHD

The classification tree for children with ASD/ADD/ADHD is presented in Figure 7. Among children with ASD/ADD/ADHD, the classification tree presented that health insurance adequacy is the most important variable followed by problems with paying medical bills, behavioral problems, needed more special care services than usual, neighborhood help, and adverse childhood experiences.

The classification tree revealed that 45% of children who had experienced one or more adverse childhood experiences and were diagnosed with behavioral problems; their current health insurance is adequate and continuous had difficulties accessing mental health care services (terminal node 8). Similarly, about 36% of children who diagnosed with behavioral problems and did not experience any adverse childhood event and their current

health insurance were adequate and continuous also had difficulties obtaining mental health care services (terminal node 7).

The left branch of the tree classified children whose health insurance coverage was inadequate and/or had a gap in insurance, which was divided further by the parents' ability to pay medical/health bills for their children. About 53% of children who experienced any behavioral problems and their parents did not have any problems in paying medical/health bills; their health insurance was inadequate and/or had a gap, had difficulties in accessing mental health services (terminal node 4).

Additionally, around 47% of children who did not need any additional special health care services; and either did not have any medical/health-related expense or their parents were not able to pay the medical bills had a higher likelihood of not accessing mental health services because of the inadequacy and/or gap in their health insurance (terminal node 1).

Lastly, about 73% of children needed more specialized care service more than usual even if they did not have any medical expenses or had problems paying medical/health-related bills; their health insurance was inadequate and/or had a gap had difficulties in meeting their mental health needs (terminal node 2). The ROC Score of the predictive model was 0.65, as shown in Figure 8.

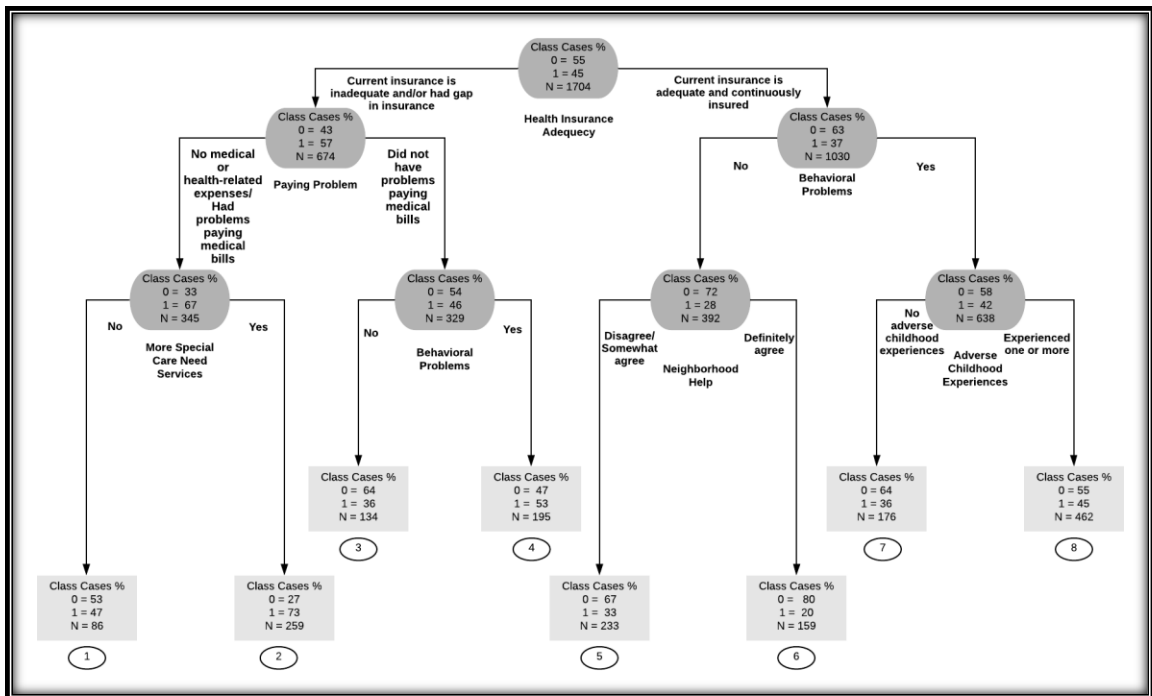


Figure 8. Classification tree for children with ASD/ADD/ADHD

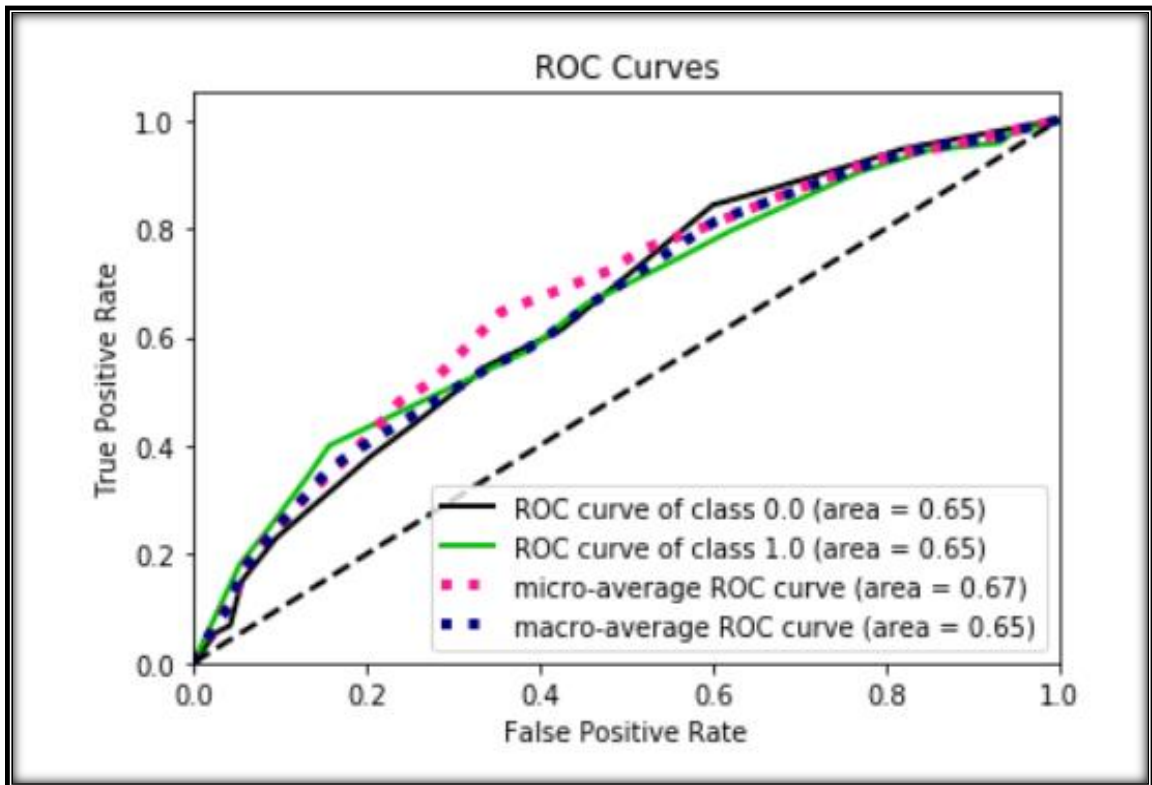


Figure 7. The ROC curve for ASD/ADD/ADHD predictive model

CHAPTER 5: Discussion

This study examined difficulties in accessing mental health care services among children with depression/anxiety and ASD/ADD/ADHD. It assessed risk factors associated with difficulties in obtaining mental health care services among these children. This chapter discussed the study's findings based on the bivariate, logistic regression models and classification trees results, and presents limitations, implications, and recommendations for future research studies.

Mental health diseases are very prevalent among children in the USA and the number of children suffering from these mental issues is getting higher year after year (Anxiety and Depression in Children, 2020; Freidl et al., 2017). However, these children face a lot of difficulties accessing mental health care services, especially among children with autism (Krauss, et.al, 2003) and anxiety and depression (Anxiety and Depression in Children, 2020). This is consistent with a number of other studies, such as Krauss and colleagues (2003) who claimed that 80% of autistic children needed treatment but did not receive it. Another study reported that the number of children getting mental diseases, such as anxiety and depression is soaring, yet the gap in treatment of their conditions remains substantially large (Anxiety and Depression in Children, 2020; Freidl et al., 2017). The difficulties in accessing mental health care services are due to a number of factors, which are thoroughly discussed in this chapter.

The results of this study show that predisposing, enabling, and need factors seem to influence to some extent the ability of children with depression/anxiety and ASD/ADD/ADHD to access mental health care services. Specifically, findings from both logistic regression analysis and classification trees indicate that the mental health care services that children with depression/anxiety and ASD/ADD/ADHD receive have been mostly affected by the enabling factors, such as adequacy of health insurance and ability of families to pay their medical/health-related bills, followed by the need factors and finally predisposing factors.

The classification tree analysis shows that health insurance adequacy is the most important variable for both children with ASD/ADD/ADHD and children with anxiety/depression followed by problems with paying medical bills, behavioral problems, needed more special care services than usual, and neighborhood help. Following the neighborhood help measure, mother's overall health is more significant for children with anxiety/depression while adverse childhood experiences seems to be essential for children with ASD/ADD/ADHD.

In addition, logistic regression results show that race/ethnicity, health insurance adequacy, medical bills, and adverse childhood experiences were significant contributors to accessing mental health care services for both children with ASD/ADD/ADHD and children with anxiety/depression. For children with anxiety/depression, neighborhood help, and behavior problems were significantly associated with difficulties accessing mental health care services whereas having other mental health conditions and the father's overall mental health were more influential for children with ASD/ADD/ADHD.

Predisposing factors

Race/Ethnicity: Based on the logistic regression model, race/ethnicity seems to influence access to mental health care services for both children with ASD/ADD/ADHD and children with anxiety/depression. Black non-Hispanic and Hispanic children with anxiety/ depression and ASD/ADD/ADHD had higher odds of having difficulties in accessing mental health care services compared to white children. These findings are consistent with those of previous studies, which indicate that minority children suffering from different mental health disorders are more likely to have difficulties accessing these services (McMorrow & Howell, 2010; McLaughlin, & Loder, 2015; Green et al., 2019). In addition, Irvin and colleagues (2018) found that black children were more prone to have unmet health care needs. Other studies also show that Latino youth are less likely to receive mental health care services (Hough et al. 2002; Howell and McFeeters 2008; Zimmerman 2005; Garland et al. 2005; Inkelas, Raghavan, Larson, Kuo, and Ortega 2007).

Furthermore, for children with autism, studies show that there are significant racial/ethnic disparities in the service used (Smith, et.al, 2020). In other words, families of color and Hispanics are more likely to report difficulty accessing mental health care services than white. Previous research evidence indicates that Hispanic children with autism and other developmental disabilities are less likely to have a personal doctor, and to receive psychological services, respite care, and intensive autism therapy compared with non-Hispanic white children with autism and other developmental disabilities (Smith, et.al, 2020). Another study claims that only 1 in 5 children with mental disorders such as anxiety

and depression are able to access mental health services despite their desperate need for care (Kataoka, Zhang, and Wells, 2002).

In the present study, based on the results from the logistic regression and classification trees there were no significant associations between age, sex, primary language spoken at home, family structure, number of family members, number of children in households, parental education level and difficulties in accessing mental health services for these groups of children. The findings of this study are consistent with the results of Chiri and Warfield study (2012), which showed that for children with autism, the predisposing factors of age and gender were not contributing factors to the difficulties accessing mental health care services. Yet according to the same study, being a single mother and primary language spoken at home are associated with difficulties in accessing mental health care services, which is inconsistent with the findings of the present study.

This can be attributed to the “cultural differences” and the difficulty in recognizing the mental health issue in early childhood (Chiri & Warfield, 2012; Mulraney & Hiscock, 2019). For instance, Inkelas and colleagues (2007) claim that “mental health conditions may also be more difficult to recognize among children from non-English speaking backgrounds, where quietness in the classroom may be mistaken for a language issue rather than a mental health issue.” The same study indicates that some parents from non-English speaking backgrounds might be hesitant to seek help due to the cultural stigma associated with mental health disorders, not to mention the difficulty in finding services for their children in their language. Additionally, according to Mulraney and Hiscock (2019) study, child misbehavior in the classroom can be explained as being naughty and not someone

who is dealing with mental issues. Alternatively, a child who has autism might be seen as someone who likes to stay alone and not someone who has a mental ailment (Mulraney & Hiscock, 2019). However, another study found a significant association between child's age and unmet mental health care services among children with anxiety whose ages were between 12 and 17 years old (Green et al., 2019).

Family size and parental education level: Some studies show that the number of family members and children in the household is associated positively with difficulty accessing mental health care services (Li et al., 2016). In the present study, there was not a significant association between these two variables. Another factor that was not significant in this study was parental education level. This is inconsistent with a study conducted on children with autism which found that parent education level plays an essential role in accessing mental health services. In fact, higher levels of parental education are significantly associated with higher levels of treatment service use (Smith, et.al, 2020). The same study found that “children of parents with more than a high school education were more likely to receive an IEP, OT, ABA, and other ASD-specific therapies than children of parents with less than a high school education.” (Smith et al., 2020). Overall, even though research shows that parental education level is important and essential in accessing mental health care service, the results of the present study show that there was no significant association between parental education level and difficulties in accessing mental health care services.

Family structure: Numerous studies show that children of single mothers are more likely to have difficulties accessing mental health care services (Simpson et al. 1997;

Cunningham and Hahn, 1994). Simpson and colleagues (1997) claim that single mothers are less likely to visit a physician for their children. However, the findings in regard to this factor are conflicting in the literature (Newacheck, 1992; Cafferata and Kasper, 2002) and in the present study as there was not a significant association between family structure and unmet mental health care needs.

Enabling Factors

The influence of enabling factors in the present study was similar across the two groups of children and methodologies used to assess their access to mental healthcare services. For instance, based on the logistic regression and classification trees, both groups of children were affected in their ability to access mental health care services by adequacy and continuous health insurance, problems paying for child's medical/health care bills, and adverse childhood experiences. Additionally, living in a community where people help each other out enhanced accessing to mental health care services for both children with anxiety/depression and those with ASD/ADD/ADHD.

Health Insurance: Having adequate health insurance is one of the top barriers to accessing mental health care services based on the results of this study. The study results indicate that more than 50% of uninsured children had difficulties in accessing mental health care services. Research evidence indicates that people with mental health conditions are less likely to have health insurance than those without mental health issues (Rowan et al., 2013).

Other research studies show that having adequate health insurance coverage is essential to accessing mental health care services (DeRigne et al., 2009). A study by Sturm and Wells (2000) show that there was a decrease in private coverage for people with mental

illness in the late 1990s and mental health services were not fully covered by the private sector while it was not available for all children with mental health disorders. For instance, children with ASD were more likely to have public insurance only compared to children with special health care needs (CSHCN) (Chiri & Warfield, 2012).

Even children with private insurance, they were “less likely to receive needed mental health counseling than those with public insurance” (Stagman & Cooper, 2010). In fact, the same study asserts that the mental care needs of 79% of children who have private insurance and 73% with public health insurance are unmet. For children with ASD, “families covered by Medicaid or other public insurers were more likely to use services considered medically necessary than those with private insurance” (Smith, et.al, 2020). The results of this study; however, show that compared to public insurance, those who had private insurance were more likely to access mental health care insurance. These findings, however, were not statistically significant.

Problems paying for child’s medical/health care bills: In the present study, not being able to pay medical bills was significantly associated with difficulty accessing health care services. This aligns with other studies, which show that medical bills in the USA are very high and families cannot always afford their children’s special health care needs (Ungar, 2019). A study shows that a total of \$11.6 billion was spent on hospital visits for mental health during 2006 and 2011 (Torio et al., 2015). Another study shows that the cost of someone suffering from autism during his or her lifespan is \$2.4 million in the USA, which is a large amount of money that many families may not be able to afford. In fact, costly medical bills can be a heavy burden on many families and they may end up choosing

between the necessary expenses, such as food, clothing, housing and paying these medical bills (Amy et.al, 2020). Overall, children with multiple chronic mental health conditions, especially those with emotional, behavioral, and developmental issues tend to have higher costs because of higher treatment or counseling is needed for their conditions (Inkelas et al, 2007), making it difficult for families to afford these medical expenses.

Adverse childhood experiences: The results of the present study show that the more adverse childhood experiences the children have, the more difficulty they have in accessing mental health care services. Adverse childhood experiences can vary ranging from emotional, physical, or sexual abuse to neglect, and violence, while others may suffer from their parents or caregivers' mental health issues (Bauer, 2019; Violence Prevention, 2020). Many studies discuss how these adverse childhood experiences can affect the child's mental health. For example, a study showed that exposure to adverse childhood experiences are associated with having depression and/or anxiety among children 6-11 years old (Zare et al., 2018).

However, limited research addressed its association to the difficulty of these children accessing mental health care services. The results of the present study that children who experience more than two adverse childhood experience are more likely to face difficulties accessing health care services are consistent with the results of Berg's and colleagues (2018) study who examined the association between adverse childhood experiences and unmet health care needs among children with ASD. These researchers found that "ACEs emerged as one of the strongest and most consistent correlates of unmet healthcare needs impacting children with ASD" (Berg et al., 2018).

Poverty level: Studies show that poverty plays a very important role in the difficulty of accessing health care (Boat and Wu, 2015). One of these studies maintains that poverty can influence children and can lead to the development of mental health problems (Hodgkinson et al.,2017). Other studies conducted on Children with ASD, children from low-income families were less likely to use health care services, and experience more difficulty getting a referral to specialty services and hospitalization than middle and high-income families (Smith, et.al, 2020). They were also less likely to have “a personal doctor” than those with high incomes (more than 200% of the FPL) not to mention the low quality of care they received (Smith, et.al, 2020). However, according to the same study, children with high income were more likely to be enrolled in “applied behavior analysis (ABA) therapy and [occupational therapy] (OT)” than those with lower income (Smith, et.al, 2020).

However, the results of the present study did not provide evidence of a significant association between poverty level and difficulty in accessing the mental health care services. This could be explained based on the work presented by the U.S. Department of Health and Human Services (2013) which reports that “children in low-income families are less likely to have high levels of expenditures than are children from families with higher incomes”. This could be because children in low-income families are more likely to be covered by Medicaid and SCHIP, which limit the co-pays charged to families.

People in the neighborhood helping each other out: The results of the present study show that neighborhood help is significantly associated with difficulties in accessing mental health services. This is in agreement with previous studies, which maintain that

community is one of the most important components of individuals' health and relationships (Gilbert, 2019). According to Gilbert (2019), "no matter if your community is big or small, finding people you connect with is vital for your mental health". In other words, having good community resources is related to improved mental health. Neighborhood is part of community that can help, facilitate, and affect the children's access to mental health services. Another study shows the importance of neighborhood help by maintaining that neighbors can have an impact, which can be either positive or negative, on the health, education, and behavior of children (Braveman et al., 2011; Galster, 2014; Gilbert, 2019). For example, "the chronic stress of living in dangerous or rundown neighborhood can affect parenting styles, which can in turn affect children" (Galster, 2014).

In addition, Robinson and colleagues (2017) stated that many community factors can be related with the children's mental, behavioral, and developmental disorders. For instance, "living in a neighborhood lacking social support (i.e., neighbors who "help each other out," "watch out for each other's children," and can be "count[ed] on" and "trusted to help my child") can impact children negatively. The essential role of neighborhood in accessing mental health services is emphasized by the results of this study, which shows that children who get help from their neighbors are less likely to have difficulty in accessing mental health care services than those who do not.

Need Factors

Based on the logistic regression and the classification trees, among children with anxiety/depression and ASD/ADD/ADHD, there was a significant association between behavioral problems, other mental health conditions, parental overall physical/mental

health status, and needed special care more than usual and difficulties in accessing mental health care services. Therefore, the more needs the children have, the more difficulties in accessing mental health services they will face. However, there was no significant association between needed special treatment for emotional/developmental behavior and developmental delay and accessing mental health care services in both groups.

Behavioral problems and other mental health conditions: The findings of this study show that there is a significant association between behavioral problems and other mental health conditions and difficulties in accessing mental health care services. The significant association between behavioral problems and other mental health conditions, such as ASD/ADD/ADHD and anxiety/depression and difficulties in accessing mental health services is also addressed by Krauss and colleagues (2003). These researchers and others maintained that more than half of children who needed mental health services, did not receive them, and these services become harder to get with the existence of comorbidities, such as development disabilities (DD) (Nageswaran et al., 2010).

Children with autism suffer even more from unmet health care needs. In a study that used the 2005–2006 National Survey of Children With Special Health Care Needs, Kogan and colleagues claim that parents of children with CSHCN and ASD are more likely to report at least one unmet need than children with CSHCN (Chiri & Warfield, 2012). They further claim that “30% of parents of children with ASD reported at least one unmet health care need, versus 12% of parents of CSHCN without ASD. These differences remained significant even after controlling other variables like sociodemographic factors (Chiri & Warfield, 2012). Similarly, compared to children who have emotional,

developmental, or behavioral problems (EDB) only, children with both EDB and ADS are more likely to have unmet health care needs (Chiri & Warfield, 2012).

In addition, for children with ASD, Chiri and Warfield (2012) maintained that the more services children with mental disorder have, the higher their needs will be (Chiri & Warfield, 2012). For example, 7% of parents reported at least one unmet need for children with CSHCN needing one to two services (Chiri & Warfield, 2012). However, 16% of parents reported at least one for children who are in need of three or four services. The number increases as the need of services increase. In addition, studies show that children with ASD are more likely to have difficulties accessing mental health care services. In their study, Krauss and colleagues (2003) maintained that “over one-third of the children with autism reported experiencing problems accessing specialty care, compared to just one-fifth of children with mental retardation, and one-fifth of children with other types of special health care needs”.

Parental overall physical/mental health status: Parental overall health is plays an essential role in the children’s health and their access to mental health care services (Cairney et al., 2004; McMorrow & Howell, 2010). This is consistent with a number of other studies which show that parental health is highly associated with the children’s well-being. According to these studies, not only does parental mental health affect the children’s mental conditions, it can affect their access to mental health services as well (England and Sim, 2009).

Parents have a crucial role in facilitating access to mental health services for their children (Sayal, 2006), especially before late adolescence; “parental disapproval can also

inhibit young people from seeking help” (Chandra and Minkovitz, 2006). A recent survey indicated that over half of parents had never communicated with their children regarding mental health, and “45% did not feel the need to” (Opinion Matters, 2015). The results of this present study show that unlike children whose parents have excellent health, for children with ASD/ADD/ADHD whose father’s overall physical and/or mental was not excellent health were more likely to struggle accessing health care services. Moreover, for the children with anxiety/depression the classification tree shows that children’s ability to access mental health services is affected by their mother overall health.

Needed special care more than usual: Having behavioral problems and other mental health conditions in addition to ASD/ADD/ADHD or anxiety/depression, and parents’ poor health can lead to many difficulties in accessing mental health care services. Based on the results of the classification tree, there was an association between needed special care more than usual and difficulties in accessing mental health care services for children with anxiety/depression and ASD/ADD/ADHD. The results of this study are in agreement with Murphey’s study (2013) which maintains that many of the children with other mental health conditions don’t have access to mental health care services despite their urgent needs. In fact, the results of this present study are supported by a number of other studies, one of which is DeRigne and colleagues’ study (2009) which claims that around 20 % of children who have different mental health conditions tend not to receive treatment or counseling. In addition, Murphey’s study (2013) indicates that although 1 in 5 of adolescents were diagnosed with mental health disorder, 60 to 90% did not receive treatment (Murphey, 2013).

Limitations

The use of survey data in this study has many limitations. One limitation is that it is cross-sectional data which does not allow any causal inferences related to the factors that influence accessing mental health care services among children with anxiety/depression and ASD/ADD/ADHD. In addition, self-reported data about the health conditions of the children and other measures used in this study can lead to biases in this sample. Other important factors were not addressed in this study, such as those related to treatment services and family engagement.

Moreover, the predictive performance of the logistic regression and the classification trees for the area under the ROC curve was ranged between 0.64 to 0.69, which would be reflected the “poor” performance for both groups children with anxiety/depression and ASD/ADD/ADHD due to the survey data. However, this study used the newest data of the NSCH 2017-2018, which addressed the association between difficulties in accessing mental health care services among children with anxiety/depression and ASD/ADD/ADHD.

Implications & Recommendations

Based on the study’s findings, some suggestions and recommendations are summarized. First, despite the limitations, this study's findings can be used to improve access to mental health care services, especially in children with mental health disabilities and special health care needs. Second, identifying risk factors that are associated with children’s unmet mental healthcare needs at an early stage can be useful in improving access to these services among those with mental health disorders. Moreover, the findings of this study can be used by both healthcare providers and policymakers in developing and

improving policies and guidelines that ensures adequate health care services for children with these specific mental health issues in improving their quality of life. Findings from this study can be used for future research studies, and interventions to increase awareness, and knowledge of mental health care utilization among families. Moreover, parents, caregivers, and schools play a significant role in children's ability to access mental health care services. Therefore, an engaging environment that includes both the family and community is important in addressing this important public health issue.

Conclusion

Children with mental health illnesses and their families are suffering from difficulties in accessing mental health care services despite the large number of children and adolescents diagnosed with mental and behavioral issues. Therefore, it is crucial to examine risk factors that affect their families' ability to obtain mental health care services, especially for children with anxiety/depression and ASD/ADD/ADHD. The result of addressing predisposing, enabling, and need factors present that those factors are significant predictors of children's difficulties in accessing mental health care services, but the level of effects differs from one to another. To illustrate, it is clear that the enabling factors, including the family and community resources, have a significant influence on both groups of children. Followed by the need factors, which involved the actual and perceived need, and lastly, the predisposing characteristics, which contains the demographics and social supports factors. In fact, knowing the barriers to access mental health services can help inform future efforts to ensure a more equitable distribution of health care services in this population.

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Biography

Ohud Baafif graduated from Umm Al-Qura University, College of Applied Medical Sciences, Makkah, Saudi Arabia and I received my Bachelor's Degree in Health Administration in 2012. I am employed as a teaching assistance in Umm Al-Qura University at Health Information Management Technology Department, Makkah, Saudi Arabia.