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Weight Management Counseling and Obesity Severity in Children With Special Health Care Needs

Adeola Sonaike
Walden University

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Walden University

College of Health Sciences

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Adeola Sonaïke

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Walden University
2015

Abstract

Weight Management Counseling and Obesity Severity in Children With
Special Health Care Needs

by

Adeola Sonaike

MPH, Walden University, 2011

BA, Rutgers University, 2008

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Public Health

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Abstract

Epidemiologic surveillance indicates an increased susceptibility to obesity among children with special health care needs (SHCN) in comparison to children without. The present study investigated this disparity in weight severity between both groups, with a focus on the provision of obesity management counseling by physicians. This study consisted of a retrospective medical record review that acknowledged the effect of patient-provider interactions on health behaviors and risk perceptions. An independent sample *t* test compared the incidence of clinician-initiated obesity management counseling received by children with SHCN to that which was received by children without SHCN. This *t* test revealed a statistically significant difference between the weight management frequency received by youth with SHCN ($M = 1.0, SD = .46498$) and the weight management frequency received by youth without SHCN ($M = 2.0, SD = .74975$), $t(100) = 7.826, p = .000, \alpha = .05$ over a 2-year timeframe. Bivariate correlation analysis validated a correlation between weight severity among children with SHCN and the incidence of clinician-initiated obesity management counseling. The results indicated a small but significant association between weight severity and weight management frequency among children with SHCN, $r(50) = .287, p = .044, \alpha = .05$. These results support the need for a transformation in the delivery of preventive health services for children with SHCN, such as providing clinician-based obesity management strategies and increasing access to validated diagnosis-specific preventive health screening tools. These results promote positive social change by informing efforts to improve health outcomes and decrease health disparities experienced by people with SHCN.

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Chapter 1: Introduction to the Study

The obesity epidemic sweeping the United States continues to have a disparate impact within the country. Public health practitioners and medical providers have adjusted to this disparity by providing community-based preventive health care services, obesity counseling, and improved health education materials to high risk populations such as minority ethnic groups, economically disadvantaged families, and uninsured civilians. Despite these modifications in preventive care services delivery, there are still minority populations whose increased risk for obesity has not received a significant population-level intervention. Americans with disabilities continue to experience a disparate burden in obesity risk compared to the general population, with a 58% higher risk of obesity among adults with disabilities compared to adults without disabilities, and a 38% higher risk of obesity among children with disabilities compared to children without disabilities (Center for Disease Control & Prevention, 2010).

It is necessary for public health professionals to recognize the disparate burden of obesity among individuals with disabilities in order to identify population-level preventive health practices that may prevent it. Prior research has indicated a need for evidence-based interventions that will increase the quality of preventive care for individuals with disabilities (De, Small, & Baur, 2008). Comparisons between preventive care methods for children without special health care needs (SHCN) and children with SHCN will provide insight into evidence-based interventions within the health sector for obesity management. This study investigated the existence of possible correlations between medical centered obesity management and obesity rates among children with

disabilities. The planned outcomes of this study were designed to aid in the identification of gaps in the delivery and quality of preventive pediatric care, and improve its impact on secondary health outcomes among children with SHCN.

Background

In 2012 there were 14.6 million children under the age of 17 years who had a SHCN in the United States (Child and Adolescent Health Measurement Initiative, 2012). Children with SHCN require specialized levels of care in order to support activities of daily living, adequate growth and development, and the prevention of secondary conditions (Friedman & Kalichman, 2014). Starting in the late 1980's, individuals with SHCN in the United States began to transform the notions of health resulting in an epidemiological shift in the definitions of disability and health (Wilber et al., 2002). This emerged due to an increased focus of disability as a public health issue both at the national level and state level. In 1991, the definition of secondary disabilities and condition emerged in the Institute of Medicine report (IOM), which demonstrated that disability status was not a static condition but one that could worsen or improve (Wilber et al., 2002). An increased support in disability and health research over the past two decades resulted in the recognition that secondary conditions experienced by people with disabilities can be prevented with the application of appropriate public health practices. In this study, SHCN is be used interchangeably with disability as a means to define individuals with intellectual and developmental disabilities (IDD).

Advances in the delivery of medical and health services through programs such as early intervention services have significantly improved the quality of life and life

expectancy for individuals with SHCN in the United States. A 35-year national prospective cohort of 60,969 people that began in 1962 reported equivalent levels of life expectancy for individuals with a mild intellectual disability in comparison to the general population (Patja, Iivanainen, Vesala, Oksanen, & Ruoppila, 2000). This progress makes aging and age-related chronic conditions an additional health factor now faced by individuals with SHCN, making it important for public health professionals to work towards a transformation of the epidemiology of health for children with SHCN. For purposes of this study, SHCN will be used interchangeably with disability as a means to define individuals with intellectual and developmental disabilities (IDD).

Discussions about disability and health in the United States have transformed in recent decades. The Disability and Health sector of the Center for Disease Control and Prevention reports that the presences or absence of health is not a defining factor of disability status. The recognition that disability is not correlated with ill health has required increased public health efforts that focus on the preservation of health throughout the lifespan irrespective of disability status. Despite these efforts, however, there continues to be an increased rate of secondary chronic conditions among the disability population (Reichard, Stolzle, & Fox, 2011). Individuals with SHCN in the United States are at increased risk for obesity and obesity-related conditions including but not limited to: asthma, bone pain, cancer, diabetes, depression, early maturation, fatigue, gastrointestinal problems, high blood pressure, high cholesterol, joint pain, low self-esteem, and sleep apnea (Havercamp, Scandlin, & Roth, 2004; Reichard, Stolzle & Fox, 2011). Epidemiologic surveillance has indicated that children with SHCN have an

increased risk of obesity, suggesting a need for research and practice to focus more attention on the reduction of comorbidities and on identifying effective health promotion efforts (De, Small, & Baur, 2008).

The most recently reported calculation of obesity-related medical expenditures in the United States was determined in 2008, and was estimated to be approximately \$142 billion, \$44 billion of which have been attributed to disability-related costs (Finkelstein, Trogon, & Cohen, 2009). Obesity-related health expenditures are a significant factor in the problem of excess annual medical spending in the United States. As a result there has been increased research into obesity-management techniques for youth and adults. The increased prevalence in obesity has resulted in transformations in obesity management techniques, such as increased screenings, similar methods must be applied with individuals with SHCN in order to reduce the disparate gap in health outcomes (Stedman & Leland, 2010).

Children with SHCN face varying barriers ranging from cognitive to physical impairments. These barriers are compounded by an uninformed and unaware medical system in which the disability itself is the focus as opposed to the general consideration of overall health and wellness (Iezzoni & O'Day, 2006). Some researchers have argued that obesity in children with disabilities is often undermanaged as the disability itself takes priority during all medical encounters (Chen, Kim, Houtrow, & Newacheck, 2009). Recommending a need for increased access to preventive care and early intervention for children with SHCN that are tailored for physical or cognitive limitations (Chen, Kim, Houtrow, & Newacheck, 2009). In order for obesity prevention efforts to have a

significant and global impact, health care professionals must first receive appropriate training in pediatric obesity counseling for children with and without SHCN that uses evidence-based interventions and practices (Patja et al., 2000).

The purpose of this quantitative study was to compare obesity severity and the management services received in pediatric care settings by low-income children with and without SHCN. This study was specifically designed to investigate the level of preventive care provided by pediatricians when a patient with a SHCN has been diagnosed with, or has a high risk of obesity or overweight. It was intended to identify quantitative evidence correlating pediatric care practices with disparate health outcomes for children with SHCN. Identifying correlations between preventive health care practices and obesity rates among children with SHCN was expected to provide insight into the need to improve pediatric care for children with SHCN. The identification of such a correlation and subsequent gaps in the delivery of pediatric care for children with SHCN is expected to support the need for an upstream transformation in the prevention of obesity.

The focus of this study was on low-income children in the United States, a decision made to minimize the impact of income level as a confounding factor in obesity disparities, as suggested by Crook and Peters (2008). The data source consisted of medical files for children with and without SHCN in New Jersey; the level of pediatric care efficacy was determined using the American Academy of Pediatrics guidelines for counseling variables. The Center for Interdisciplinary Health Disparities Research (CIHDR) which is the central location for data on such health disparities is expected to contain information reflecting health disparities experienced by people with disabilities.

Upon review of this data source it was noted that there are still significant data gaps pertaining to individuals with disabilities (Truman et al., 2011). Due to a lack of available secondary data to conduct the study, primary data was obtained from medical files. Increasing the availability of data that uses disability status as a variable of comparison was intended to provide an opportunity for public health practitioners and healthcare providers to organize efforts in decreasing these disparities in an upstream manner that takes into account the environmental and social implications on health outcomes. This research is expected to provide a population health perspective on children with SHCN, allowing for an objective analysis of the societal and environmental support systems available to children with SHCN when interacting with the health care system.

In order for the comorbidities of obesity and disability to be significantly reduced, practitioners must address the following factors within the child as it pertains to obesity: level of risk, health behaviors that are increasing the risk, and individual barriers to change (Chen, Kim, Houtrow & Newacheck, 2009). Focusing on improving the quality of life should be the goal of all health practitioners, whether through primary or secondary preventive mechanisms. Therefore it is important for any variable that may affect quality of life to be considered during all medical encounters, irrespective of primary diagnosis or previously existing conditions. The quality of life impact from secondary chronic conditions for an individual with disabilities are significant; research indicates that individuals with disabilities are more likely to report fair or poor health in comparison to individuals without disabilities (Havercamp, Scandlin, & Roth, 2004). Recommendations to improve the quality of life of individuals with SHCN include the

creation of health interventions designed specifically to meet the varying needs of people with SHCN. Research however is required to not only investigate such best practices in a quantitative manner, but also to identify the gaps in the delivery care where such interventions will be most effective. This study will focus on the latter, with the aim to compare the differences in the delivery of preventive care and quality of life outcomes for low-income children with and without SHCN.

Problem Statement

The distribution of obesity in the United States indicates that children with SHCN have an increased risk of obesity and obesity-related chronic conditions in comparison with children without SHCN (CDC, 2008). Despite the increased risk of chronic diseases and the disproportionate prevalence of obesity, diabetes, and cardiovascular disease in this population, limited research has addressed gaps in the delivery of preventive health care and potential factors impacting disparities in these health outcomes (Reichard, Stolzle, & Fox, 2011). An initial review of the literature revealed that the majority of childhood obesity research focuses on youth without SHCN, resulting in a significant gap in evidence-based research identifying effective preventive health practices that are tailored for the disability population. This creates a problem of limited scholarly information available pertaining to obesity management practices for children with SHCN, making practitioners more likely to not be aware of appropriate identification and risk management practices when caring for an obese child with a SHCN.

Purpose of the Study

This study was a comparative, quantitative analysis of pediatric obesity management methods for low-income children with and without SHCN in NJ. The purpose of the study was to determine the differences between obesity management and obesity severity among children with and without SHCN. Individuals with disabilities face barriers to health promotion services that can be attributed to social level influences such as perceived and physical barriers, stigma and stereotypes, and a chronic lack of opportunity (Center on Health Promotion Research for Persons with Disabilities, 2009). Epidemiologic surveillance of chronic diseases such as obesity, diabetes mellitus, cardiovascular disease and hypertension indicates the impact of economic welfare and ethnicity on disparities of health outcomes (Crook & Peters, 2008). As a result, the intent of this comparative study was to ascertain the upstream source of predicted limited opportunities for preventive health. The socioeconomic impact on the disparities in obesity outcomes was addressed in this study by focusing only on low-income families and children.

The Healthy People Objectives are the United States' multiyear benchmarks developed every decade to improve the Nation's health (Healthy People, 2015). The Healthy People 2020 Objectives state that the need to increase overweight and obesity screening is a public health priority in the United States. A study of this nature that focuses on clinician-based obesity screening and management will further inform practitioners of the need to increase the provision of such services (Smith et al., 2011). This research investigated a possible correlation between preventive health pediatric

practices and the prevalence of childhood obesity among children diagnosed with a SHCN in New Jersey, focusing upon the delivery of preventive health practices through the medical sector. This research study compared preventive health pediatric practices for children without a SHCN and for children with a SHCN through the review of medical health records. The independent variable was disability status and the dependent variables were obesity status and the occurrence of obesity management in the medical sector.

Research Questions

The primary research questions addressed in the present study were:

RQ1: Is there a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey?

H1_o: There is no statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

H1_a: There is a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

RQ2: Is there a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey?

H2_o: There is no relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

H2_a: There is a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

Theoretical Framework

Social cognitive theory. Social cognitive theory (SCT) is a model of interpersonal health behaviors as a constant continuum between the individual, their environment, and resulting health behaviors (Glanz, Rimer, & Viswanath, 2008). This theoretical framework recognizes health behaviors as not being isolated events, and was applicable for this study because it identifies variables that allow for a more accurate prediction of health behaviors (O’Dea & Wilson, 2006). This study investigated the potential influence of specific variables on an individual’s health behaviors and as precursors to resultant disparities between children with SHCN and children without SHCN. This theory was adopted by the principal investigator to support the hypothesis that low-income children with SHCN do not have the same risk of obesity as low-income children without SHCN.

SCT has nine key concepts; four of these – self-efficacy, incentive motivation, facilitation, and self-regulation – all play a significant role in the disparity of obesity outcomes between children with and without SHCN (Glanz, Rimer, & Viswanath, 2008). For a child with a SHCN, self-efficacy describes the belief of a child with SHCN to

achieve a healthy and active lifestyle similar to that of his/her peers. Incentive motivation describes the misuse of unhealthy treats as an incentive for good behavior, thereby resulting in an unhealthy diet. Facilitation describes the level of accessibility for a child with a SHCN to resources that promote physical activity. Self-regulation describes the inability of a child with a SHCN to control their diet due to either their diagnosis or the influence of their caregiver.

The SCT provides a comprehensive construct that supports the need for this particular study to identify key variables influencing the disparate burden of obesity among children with SHCN. Using SCT allowed for a deeper understanding of the multifaceted impact of the social and built environment on obesity outcomes among children with SHCN. SCT demonstrates the multiple facets impacting health outcomes and an application of this theory rejects any original misconceptions that obesity rates within people with disabilities are solely a result of the disability itself. The application of this theory to obesity management provides a theoretical foundation for researchers and practitioners to investigate and determine the specific variables influencing an individual's interpersonal health behaviors.

Health belief model. The health belief model (HBM) describes a theoretical relationship between perceptions and health behaviors (Glanz, Rimer, & Viswanath, 2008). When applied to obesity, HBM suggests that a person is more likely to accept obesity management counseling if they perceive that they are susceptible to obesity. This theoretical framework emphasizes the importance of practitioners ensuring that caregivers of children with SHCN have an accurate perception of the susceptibility and

severity of obesity within the disability population. Previous research has indicated that physicians strongly influence the health behaviors of their patients through the delivery of accessible preventive care information for diet and exercise (Smith et al., 2011).

Caregivers may be more likely to create a supportive environment that encourages positive health behaviors if advised by a practitioner.

HBM emphasizes the impact of risk perception on health behaviors. Applying HBM to the caregiver's role in adhering to a physician's obesity management plan for a child with a SHN, requires an accurate awareness of the child's obesity risk susceptibility. Without an accurate perception caregivers may not be aware of the risk or the severity of the risk, thereby reducing the likeliness of informed decisions with regards to combating obesity among children with SHCN. HBM provides insight into the impact of perceived health on overall health outcomes and behaviors; and can therefore also be considered with regards to perceptions of ideal health for a child with a SHCN. The inclusion of the aforementioned SCT also prevents a sole reliance on the HBM, which often neglects social and environmental influences on health outcomes. Broadening the HBM to consider external variables provides a more accurate insight into the influences on health disparities between children without SHCN and a broad spectrum of children with SHCN.

Theory of reasoned action. The theory of reasoned action (TRA) describes the impact of behavioral intent on a specific health behavior, with that intent being directly impacted by an individual's attitude and subjective norm towards the health behavior (Glanz, Rimer, & Viswanath, 2008). The risk of secondary chronic conditions in children

with SHCN drastically impacts their quality of life. The ability to prevent the onset of secondary chronic conditions such as obesity is a positively valued outcome that, if presented to a caregiver effectively can result in a change in health behaviors. This indicates the importance of relaying accurate information to caregivers from a trusted source such as a medical provider with regards to encouraging positive health behaviors. While many interventions can occur in community settings outside of the medical care facility, this theory supports the need for obesity prevention/management counseling to be initiated by the pediatric practitioner who can transform the beliefs and attitude of the caregiver in a positive manner due to the rapport they have built with the family.

Patient-Provider interaction: Patient-Provider interactions offer variations of patient involvement levels, ranging from passive to active; providing a descriptive model of patient-provider communication that can predict health outcomes (Glanz, Rimer, & Viswanath, 2008). For purposes of this study, the four control based categories of interaction were adopted as a means to describe the patient-provider interaction between the pediatrician and the child with a SHCN/caregiver. These categories included: paternalistic in which the provider maintains a high level of control, while the patient maintains none if any control; mutuality in which the provider and the patient maintain a balance in the control of the interactions and decision making; default in which neither party assumes control therefore often resulting in patient dissatisfaction and nonparticipation; and, consumerism in which the patient maintains a high level of control, while the provider aims to abide to the goals and needs of the patient (Roter & Hall, 1992; Kaplan et al., 1996; Stewart, 2001; Sleath, 1996). The impact of patient-provider

communication can be apparent in health-related behaviors exhibited by the patient especially with regards to diet and exercise. This is due in part to the influence that such interactions have on individual decision-making and problem-solving skills required by the patient to adopt a physician-recommended healthy lifestyle change.

Previous research indicates that individuals with disabilities are receiving health care services, as is evident in high medical expenditures; however the disparate prevalence of chronic conditions reveals limitations in the medical system to adequately provide preventive health care services in the patient-provider setting for individuals with disabilities (Reichard, Stolzle, & Fox, 2011). Using this theoretical model, the review of medical charts provided insight into the function of the patient-provider interaction so as to better predict whether or not the employed communication methods are promoting or unintentionally inhibiting healthy lifestyle changes in the patient. Medical chart reviews can be used to identify whether or not a specific obesity management technique has been agreed upon between the provider and the caregiver, and whether or not the specific technique appeared to be successful in achieving optimal health outcomes. According to this model, the physician assumes six functions when communicating with patients: fostering healing relationships, information exchange, responding to emotions, managing uncertainty, making decisions, and enabling patient self-management (Glanz, Rimer, & Viswanath, 2008). The approach for achieving these functions differs from patient to patient. The comparison between this process for children with SHCN and children without SHCN may provide some additional insight into what communication methods tend to be readily accepted and efficient when caring for a child with SHCN.

A combination of the aforementioned theoretical frameworks provided a template upon which to assess the data, drawing supported inferences pertaining to the epidemiology of obesity in children with SHCN and pediatrician-focused methods to combat it. Recognizing the impact from environmental and social influences, to individual behavioral, interpersonal and provider communication influences, this study aimed to connect health outcomes with specific influences within each construct thereby providing insight into the causes affecting the disparities in childhood obesity.

Conceptual Framework

There are significant gaps in the provision of insight into the epidemiology of childhood obesity within people with disabilities (Bandini, Curtin, Hamad, Tybor, & Must, 2005). Understanding the epidemiology of obesity among children with SHCN entails a multidisciplinary comprehension of the environmental, behavioral and biological interactions unique to a person with a disability throughout their lifespan. The Center for Interdisciplinary Health Disparities Research (CIHDR) Model provides a causal chain that attributes such health disparities to a link between population (social) level determinants and disease (genetic) level determinants in health outcomes (Gehlert et al., 2008). This study challenged the misconception that disparities in obesity outcomes for children with SHCN are a symptom of the genetics of disabilities, by investigating the impact of social level determinants on generalized health behaviors among people with disabilities. The CIHDR Model supports downward causation by demonstrating the impact that social and environmental factors can have on increasing the risk for adverse health outcomes within specific groups of people (Gehlert et al., 2008). Applying this

model to this research presented a link between obesity rates for children with SHCN and the clinical-based obesity management techniques utilized to shape psychological and behavioral responses to obesity risk.

Nature of the Study

This survey design study was based on a primary data analysis of medical charts of pediatric providers in New Jersey who provided preventive health care services to low-income children with and without SHCN. The medical charts were accessed with permission of Medicaid providers whose patient base includes a significant percentage of children with SHCN in order to conduct a generalizable comparative study. This quantitative study was conducted through the review of Medical files of children residing in a low-income city of New Jersey. In order to conduct an externally valid study, the medical records of children with SHCN and without SHCN were reviewed. The results of this comparative study were used to determine the frequency of preventive health discussions for children with SHCN who are overweight or obese in comparison to children without SHCN who are overweight or obese. Furthermore this sample population allowed for an analysis of obesity rates within the New Jersey-Medicaid pediatric disability population.

Definitions

This study investigated the relationship between disability status and obesity outcomes in children. For purposes of this research, disability status was defined as the independent variable, and obesity outcomes was defined as the dependent variable. Recognizing that the relationship between these variables may be moderated by various

external variables, the presence of pediatric obesity screening or counseling within the clinical setting served as the covariate.

Children with special health care needs (SHCN) are defined by the Federal Maternal and Child Health Bureau as “those who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally”.

Disability and SHCN were used interchangeably throughout the study.

Obesity Status is defined by the presence or absence of overweight or obesity. Childhood obesity status is determined using the Center for Disease Control and Prevention’s growth charts where overweight refers to a BMI at or above the 85th percentile and lower than the 95th percentile of those in the same gender and age group; and obese refers to a BMI at or above the 95th percentile of those in the same gender and age group (Barlow et al., 2007).

Assumptions, Scope of Study, and Limitations

This study aimed to provide an increased insight into the variables influencing disparities in health outcomes between children with SHCN and children without SHCN. Income level is often strained within families impacted by disability, therefore this study limited the impact of economic status as a confounder by focusing upon low-income families receiving health insurance through Medicaid or at a Medical Center in a lower-income urban community, as defined by New Jersey’s Median Household Income County Rankings based on U.S Census American Community Survey. While childhood obesity is a broad topic with various social level and individual level influences, this

study focused specifically on the management of childhood obesity within the clinical setting. The pediatric clinical setting was selected in order to construct a study that was not limited by response or recall bias, as is often the case in community-based survey studies. Previous research investigating clinical based practices has been administered via the distribution of surveys to practitioners; however such studies are limited by the self-reported nature (Smith et al., 2011). Through the retrospective review of medical records, the frequency of obesity screening and counseling can be collected from a primary data source without any potential impact of reporting bias (Preen, Holman, Lawrence, Baynham, & Semmens, 2004). In order to maximize the generalizability of the study outcomes it was important to review the charts of various practitioners. The principal investigator accepted the risk that difference note taking methods of each practitioner would create some bias in the interpretation of what is written in the charts.

Public Health Significance

This objective research will positively impact the manner in which the general healthcare needs of children with SHCN are addressed by public health practitioners and medical providers, thereby bringing people with disabilities into the national wellness discussion. With a focus on the delivery of preventive health care services for children with SHCN, this study demonstrated the need to tailor obesity management techniques not only in the community setting, but also the clinical setting. The three-fold increase of childhood obesity over the past decade is a growing public health issue in the United States, with higher rates being evident in minority and low-income children (Center for Disease Control and Prevention, 2012). Recognizing the preventive health overlap

between the primary care and public health sectors, this research provides insight into the frequency rates of obesity screening for low-income children with a SHCN. Investigating upstream preventive health practices within the primary care setting identified gaps early in life within the delivery of pediatric care. This research will lead to a demonstrated need to better educate medical professionals in providing essential health benefits such as obesity screening and management to children with SHCN. Obese children often become obese adults and the same could be said for a child with SHCN (Freedman et al., 2005). The epidemiologic shift in the disability and health discussion must also recognize that children with SHCN are now living longer, outliving their family caregivers, and are more prone to chronic conditions associated with aging which results in higher medical expenditures (Minihan, Fitch, & Must, 2007). Therefore the focus of primary care visits should not be on the disability itself, but the overall health of the individual. Previous research indicates that in treating children with SHCN, pediatricians' reference; insufficient time, insufficient reimbursements and lack of support services, as barriers to providing sufficient care (Agrawal et al., 2012). To combat these barriers, health policy makers must be aware that the disparity of health outcomes for children with SHCN is connected to the level of care received in the clinical setting. This research demonstrated this through the comparison of the level of obesity management counseling received by children with and without SHCN within the same socioeconomic status, thereby promoting policy change. The broader significance of this research is to promote an improved quality of life for individuals with SHCN through an assessment of preventive health screenings and the early detection of obesity and obesity related chronic conditions

among low-income children with a SHCN. The 2011-12 National Survey of Children's Health indicates that only 34.1% of children with SHCN met the quality health care index while 40.2% of children without SHCN met the index. The quality health care index reveals information pertaining to an individual's continuous access to and interactions with preventive health care services over a 12-month period. This information reflects the limitations children with SHCN have in accessing preventive medical care in comparison to children without SHCN. Furthermore this survey reports that 43.6% of children with SHCN did not receive effective care coordination when needed, in comparison to 28.6% of children without SHCN, while 56.3% of children without SHCN met all domains (Child and Adolescent Health Measurement Initiative, 2012). Assessing the efficacy of pediatric care for children with SHCN could provide quantitative evidence supporting the hypothesis that the preventive health care needs of children with SHCN are not being met.

Nationally, public health entities such as the Center for Disease Control and Prevention (CDC) are striving to eliminate health disparities. The CDC Health Disparities and Inequalities Report (CHDIR) has become a central location for data on health disparities and health inequalities; however there are still vast data gaps pertaining to individuals with disabilities (Truman et al., 2011). The goal of the 2011 CHDIR is to report health disparity and health inequality data that are based on behavioral health factors and preventive health service using comparative indicators such as income level and disability status. This report reflects a limitation in the number of published health reports that included disability-identifying elements, noting that only 36% of the topics in

the 2011 CHDIR incorporated disability status as a cause of health disparities. This trend extends beyond CHDIR, as 10 of the 27 chapters in the Healthy People 2010 report did not include disability objectives. This study will contribute to the available data that uses disability status as a variable of comparison, providing an opportunity for public health practitioners and health promoters to organize efforts in decreasing these disparities in an upstream manner that takes into account the environmental and social implications on health outcomes. This research provides a population health perspective on children with SHCN. Such research allows for an objective analysis of the societal and environmental support systems available to children with SHCN when interacting with the health care system. These interactions, which often present teachable moments, are instrumental in shaping an individual's self-efficacy and perceptions of health early in life.

Summary

Chapter 1 provides insight into the disparate health outcomes experienced by children with SHCN in comparison to their peers without SHCN. The demonstration of the problem that was investigated through this study is indicative of the need for such a clinically-focused study. The increased rate of obesity and obesity-related chronic conditions will likely have a negative impact on the current and future quality of life of children with and without SHCN. However, the disparate burden of obesity that is experienced by low-income children and children with SHCN presents a need for a multidisciplinary public health response. This research addressed this disparity by investigating the frequency and delivery of obesity screening and obesity management counseling for children with SHCN. Incorporating the Center for Interdisciplinary Health

Disparities Research (CIHDR) model promotes the notion that the disparities in obesity outcomes are moderated by social level influences such as pediatric care as opposed to solely genetic level influences such as disability status. This present study will positively impact the delivery of clinical based obesity management services for children with SHCN, by representing the need for such services and the importance of training practitioners to adequately offer such services.

Chapter 2: Literature Review

Introduction

Obesity outcomes in the United States for children with special health care needs (SHCN) vary significantly compared to children without SHCN. This disparate public health issue raises questions about limitations in access to health promotion services for children with SHCN. These health promotion services include screening, management, and prevention strategies adopted to improve health and wellness outcomes. This research investigated clinician-based health promotion services offered by pediatricians through an objective analysis of obesity screening, counseling, and management care provided to children with SHCN.

Nationally representative surveys such as the continuous National Health and Nutrition Examination Survey (NHANES) and the National Survey of Children's Health (NSCH) have documented the increasing prevalence of obesity among children with disabilities in the United States, in comparison to typically developing children (Bandini et al., 2005; Chen, Kim, Houtrow, & Newacheck, 2010). Surgeon General Reports and the Healthy People Objectives continue to indicate a need for increased research and interventions that focus on the health and wellness outcomes for people with disabilities (Healthy People, 2015). Despite these efforts, researchers have continued to note people with disabilities' lack of access to tailored obesity management and health promotion resources (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). The need for additional research on the maintenance and promotion of optimal health and wellness outcomes for children with SHCN is a major theme in this study's literature review.

Literature Search Strategy

The literature search used several public health search engines, including PubMed, the Cumulative Index to Nursing & Allied Health Literature (CINAHL), and MEDLINE. These search engines were accessed through Walden University's Health Sciences Database. The researcher also examined material from government and project websites such as the Center for Disease Control and Prevention's Disability and Health Data System and the Data Resource Center for Child and Adolescent Health's National Survey of Children With Special Health Care Needs.

Literature eligible for inclusion was identified using a combination of the following keywords: caregivers, childhood obesity, chronic disease burden, developmental disabilities, health communication, health disparities, health education, intellectual disabilities, multimodal communication methods, obesity counseling, obesity management, obesity outcomes, obesity screening, pediatric care, socioeconomic status, special health care needs, and visual cues. Many of the keywords were searched in combination with special health care need or disability to ensure that reviewed literature remained within the research subject area.

Most of the systematic review focused on literature published within the past 10 years. However, it was recognized that several studies published prior to this timeframe provided background information and theoretical frameworks, so these were included for these purposes only. Literature published prior to this timeframe without a focus on children with special health care needs or the identified theoretical frameworks: social cognitive theory, health belief model, theory of reasoned action, and patient-provider

interaction, were generally excluded from the review. The general focus of the literature review was on U.S.-based research, but several international studies were included that contributed to documenting the global scope of this public health issue.

Theoretical Foundation

A composite framework integrating four theories was utilized to support the hypotheses of this study; the social cognitive theory, the health belief model, the theory of reasoned action and the patient-provider interaction theory. A combination of these theories supports the notion that multiple factors impact risk susceptibility to obesity such as self-efficacy, perceived risk, the relationship between the patient and their provider, and cues to action. There is a need to focus on obesity prevention within the clinical setting, paying particular attention to the identification of differences in patient-provider interactions for children with SHCN in comparison to children without SHCN. The identification of any differences between such interactions indicate an association with possible differences in obesity outcomes between children with and without SHCN. Furthermore, these theories collectively suggest a conceptual link between the beliefs and perceptions of parents and providers, and how these beliefs and perceptions may contribute to disparities in obesity rates between children with and without SHCN. A composite framework integrating four theories was utilized to investigate the relationship between pediatric obesity management and obesity outcomes among children with SHCN. These included the patient-provider interaction theory, the theory of reasoned action, the health belief model and the social cognitive theory.

Patient-Provider Interaction Theory

Patient-provider interaction theories originated over 60 years ago as a means of categorizing communication encounters between providers and their patients (Parsons, 1951; Roter & Hall, 1992). The notion of this theory is that effective communication between providers and their patients leads to better health. This theory provided an explanatory mechanism for the relation between clinician-based encounters and patient-focused health behaviors. This theory provided a foundation upon which to evaluate the impact that pediatric centered obesity counseling has on obesity severity among children with SHCN in comparison to children without SHCN. The impact that medical encounters can have on transforming the health beliefs of individuals creates a linkage between the patient-provider interaction theory and the health belief model that will be later discussed in this chapter.

The four categories that were utilized to determine the interaction method between patient and provider include: paternalistic, mutuality, default and consumerism (Glanz, Rimer, & Viswanath, 2008). An analysis of the interactions categorized between children with SHCN and their pediatricians provided insight into the impact that these interactions are having on the health beliefs of the patient. The multidimensional impacts on obesity outcomes are often noted by both physician and patient, but research studies have emphasized the importance of both parties maintaining similar outlooks on the level of influence that certain factors have upon obesity incidence, in order to devise a successful weight management plan (Ogden et al., 2001). Many patients attribute their obesity to genetic causes, while health care practitioners often attribute their patients'

obesity to individual behaviors; Ogden et al. (2001) demonstrates that the level of agreement during patient-provider interactions can implicate obesity outcomes and the success of obesity management interventions.

In order to maximize the likeliness of compliance to a recommended intervention, the patient-provider interactions must maintain a level of mutuality. Such mutuality is often categorized as best practices within the medical field, as improved communication maximizes the practice of agreeable health behaviors that will lead to optimal health outcomes (Staiger, Jarvik, Deyo, Martin, & Braddock, 2005). Mutuality allows the patient and provider to reach a common ground that remains sensitive to the perceptions of the patient and respects the knowledge of the physician, such patient-centered models of care improves the patients' health status and efficiency of care (Stewart et al., 2000). A patient must have a positive attitude towards a pediatrician's obesity management plan in order to ensure compliance (Staiger, Jarvik, Deyo, Martin, & Braddock, 2005). To ensure this, Ogden et al. (2001) suggested that practitioners should welcome a level of consumerism during patient-provider interactions by agreeing to disagree, thereby ensuring a positive attitude in order to maximize the health outcomes of the patient.

Theory of Reasoned Action

The theory of reasoned action (TRA) affirms that behavioral intent is the primary factor in determining individual health behaviors. It describes a relationship between attitude, intention and behaviors, and was created in 1967 by Martin Fishbein with a focus on the attitude towards particular actions or behavior (Fishbein, 1967; Fishbein, 1993). The TRA construct calls for an investigation of the attitudes of pediatricians

towards obesity management for children with and without SHCN. A cross-sectional study of 2,590 physicians indicated that 44% of respondents reported intent on measuring BMI in children and adolescents (Khanna et al., 2009). The TRA was included in the present study as a means to further explain any differences in frequency of clinical-based obesity management between children with or without SHCN.

The identification of such differences in obesity management frequency unveiled differences in beliefs the pediatricians have towards obesity management for patients with varying levels of need. Although childhood obesity is a serious health condition that requires treatment, there is limited research that indicates the pediatricians' role in managing obesity for children with SHCN. A national needs assessment based on 939 pediatric practitioners documented the knowledge of severity of the childhood obesity epidemic and the need for interventions and training of practitioners on appropriate obesity management techniques (Barlow et al., 2002). However this previous research did not include information pertaining to children with SHCN.

Health Belief Model

The health belief model (HBM) originated in the 1950s through the work of Irwin M. Rosenstock, Godfrey M. Hochbaum, S. Stephen Kegeles, and Howard Leventhal. These authors sought to understand health behaviors related to screening and immunizations (Hochbaum, 1958; Rosenstock, 1974). The application of this model to chronic illness such as obesity creates a construct that predicts health-related behaviors based on perceived susceptibility, perceived risk of disease, cues to action, self-efficacy,

and the perceived benefits and barriers of preventive treatment (Glanz, Rimer, & Viswanath, 2008).

A patient's health behaviors are often impacted by their perceived risk of disease, therefore according to the HBM, knowledge of their obesity risk can potentially affect their likeliness to accept obesity counseling. The impact that patient-provider interactions can have on health outcomes further demonstrates the need to not only focus upon the discrepancies in perceptions of health risks for obese children, but also upon the health behaviors that are being affected by such perceptions.

HBM provides a model that conceptualizes the relationship between perceptions and health behaviors. With parents assuming a significant level of influence upon the health behaviors of their children, it is important to take into account their perceptions (Andrews, Silk, & Inheli, 2010). The role of the parent and the provider in obesity management are instrumental in the achievement of optimal outcomes for children with SHCN who are at risk of obesity. Therefore, in order to transform the health behaviors of a child who is at risk of obesity, the parents must perceive the following; that their child is highly susceptible to being obese; that childhood obesity is a serious condition; that there are clear cues to action; that they are able to combat the obesity risks; and that the benefits of clinical based obesity management and prevention outweigh the barriers to making a lifestyle change (Andrews, Silk, & Inheli, 2010).

Practitioners are therefore responsible for not only providing obesity management counseling to at-risk patients, but also for building a positive rapport with their patient that will motivate them to make positive lifestyle changes. A cross-sectional survey of

356 pediatricians indicates that while 39% of providers feel that they should be responsible for providing effective obesity management for their patients, only 12% reported a high level of self-efficacy in doing so (Perrin, Flower, Garrett, & Ammerman, 2005). With the prevalence of obesity reportedly being higher among children with SHCN in comparison to children without SHCN, it may be possible that fewer than 39% of providers attend to the obesity management needs of children with SHCN. This may be due to a greater focus on the immediate disability management needs of a child with a SHCN, especially in instances where obesity is not a current or immediate concern. The correlations between providers perceived concerns and efficacy in providing obesity management to a patient may impact the frequency of obesity management care provided.

Social Cognitive Theory

Social cognitive theory (SCT) was created in 1986 by Albert Bandura and proposed a link between the environment and individual behaviors (Bandura, 1986). The etiology of obesity requires an insight into physiological, societal, environmental, personal and biological factors. The utilization of this theory in this study is to demonstrate the impact of the social and supportive environment on children who are receiving obesity management.

Surveys of pediatric practitioners indicates that barriers to optimal obesity management outcomes includes; minimal family involvement, patient motivation, support services, time and reimbursement (Barlow et al., 2002). The SCT asserts the

importance of a supportive social environment in the promotion of positive health behaviors.

The Healthy Lifestyle Change Program (HLCP) is a community-based intervention that improves the health, nutrition, fitness and self-efficacy of adults with developmental disabilities. Based on the SCT this method utilizes peer mentors, caregivers, care providers, and medical providers to improve the beliefs and self-efficacy of participants. Evaluations of the effectiveness of this approach resulted in a 61% increase in physical activity, and an overall improvement in eating habits among 44 adults with developmental disabilities (Bazzano et al., 2009).

Analyzing weight severity among children with SHCN in relation to access to obesity management resources may demonstrate the impact that a supportive environment can have on obesity outcomes. For a child with a SHCN, this supportive environment is largely impacted by the caregiver. Therefore interactions with available resources rely heavily upon the self-efficacy views of the caregiver, and not necessarily on the child with a SHCN. Variables of interest include family involvement, patient motivation, accessibility of support services and obesity outcomes. Furthermore the SCT indicates that these factors are directly correlated to an individual's indication of self-efficacy in achieving desired health outcomes (Glanz, Rimer, & Viswanath, 2008).

For children with SHCN, self-efficacy may be applied to the self-efficacy of the caregiver in ensuring the child achieves desired health outcomes. For children without SHCN, self-efficacy may be applied to both the child and parent in ensuring the child achieves desired health outcomes. Therefore differences in obesity management

frequency for children with and without SHCN may be impacted by a disparity in the reliance on the caregiver's self-efficacy for a child with a SHCN in comparison to that for a child without a SHCN. Caregiver self-efficacy and involvement may be a contributing variable in any discrepancy identified between obesity management frequency for children with and without SHCN. It is possible that the focus on the barriers impacting self-efficacy levels for children with SHCN may impact the frequency of obesity management counseling received by children with SHCN. However, clinicians must also focus on self-efficacy of the caregiver when providing obesity management to children with SHCN, as a gauge for obesity management efficacy.

Conceptual Framework

This study investigated weight severity and the incidence of obesity management of children with and without SHCN through the review of pediatric medical charts of children with and without SHCN. A multifaceted approach is often assumed when preventing or treating chronic illness, therefore such an approach was taken in the research of obesity management for children with SHCN.

The Center for Interdisciplinary Health Disparities Research (CIHDR) Model provides a multifaceted insight to the presence of health disparities between two populations. For purposes of this study, children with SHCN and children without SHCN will represent the two populations being compared. The CIHDR asserts that population level determinants and disease level determinants contribute to the disparate burden of chronic illness among minority populations. The CIHDR model calls for an investigation

of the pathways between the environment and health status, as opposed to a sole focus on individual behavior.

Medical professionals, health promotion professionals and public health professionals are key influences in obesity management for all children, irrespective of disability status (Rimmer, Chen, & Hsieh, 2011). It is important to note that these professionals therefore are perceived to have the skillset to manage the biological and environmental variables that are increasing obesity risk for children with SHCN. If such skillsets and intent were uniform for pediatricians treating children with and without SHCN for obesity, then weight severity among both populations should be uniform.

The CIHDR model however implores the consideration of disparities at multiple levels in context to the lifestyle of the individual therefore assuming that differing obesity rates may be attributed to a combination of interrelated genetic and social determinants (Warnecke et al., 2008). This model therefore limits a reliance on the misconception that obesity in children with SHCN is attributed solely to biological level influences. Furthermore the CIHDR model provides a reasoning for the use of the aforementioned theoretical frameworks in describing clinician based obesity management for children with SHCN. The inclusion of this conceptual framework allows for the consideration of obesity management for children with SHCN at the population level as opposed to the individual level. Maintaining a population health viewpoint on the health outcomes for children with SHCN will allow this research to significantly contribute to public health and disability discussions and policy.

Weight Severity in Children with SHCN

Surveillance indicates that children with disabilities have a 38% increased rate of obesity and overweight in comparison with children without disabilities (Center for Disease Control and Prevention, 2008). Research attributes this increased rate to a variety of influences such as, medication-induced weight gain (e.g. risperidone), parental socioeconomic status, physical limitations that result in lower physical activity levels (e.g. cerebral palsy), and underlying conditions due to specific diagnosis (e.g. Prader-Willi Syndrome) (Minihan, Must, Anderson, Popper, & Dworetzky, 2011).

Primary public health efforts in reducing pediatric obesity include a focus on increasing physical activity levels. Researchers may argue that the emphasis on physical activity is the reason why children with SHCN face barriers in obesity management interventions. However, an internet-based survey completed by 461 parents of children with adolescents compared obesity/overweight in children with autism in comparison to children without SHCN and reported higher rates of obesity in children with autism (obese – 24.6% vs. 13.0%, OR = 2.19, 95% CI = 1.44–3.31; overweight– 42.5% vs. 28.8%, OR = 1.84, 95% CI = 1.28–2.64) (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). This same study reported that children with Down syndrome had higher rates of obesity/overweight than children without SHCN (obese- 31.2% vs. 13.0%, OR = 3.00, 95% CI = 1.86–4.81; overweight- 55.0%, OR = 3.01, 95% CI = 1.86–4.66) (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). It was also reported that children with cerebral palsy have lower rates of obesity/overweight compared to children without SHCN (obese- 4.0% vs. 13.0%, OR = 0.30, 95% CI = 0.13-0.68; overweight-

18.8% vs. 28.8%, OR = 0.57, 95% CI = 0.37-0.87) (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). The results of this study indicated that youth with Autism and Down Syndrome were among those with the highest rates of obesity (24.6% and 31.2% respectively) and that youth with cerebral palsy were among those with the lowest rates of obesity (4.0%); therefore, it is plausible to theorize that attributing increased obesity rates to physical limitations is not a reliable causative correlation to apply to children with SHCN. This results of the aforementioned study suggest that an understanding and investigation of weight severity of children with SHCN would require a multifaceted approach, as is assumed when understanding and investigation the weight severity of children without SHCN. This information presented in the aforementioned study indicates that additional research is needed to investigate weight severity of children with SHCN.

Despite national data depicting higher rates of obesity in children with SHCN, 22% of children with disabilities are obese in comparison with 16% of children without disabilities; this information was obtained by self-reported data (CDC, 2010). Minimal research has been conducted investigating specific weight severity in children with SHCN, and there are no current studies reflecting the rate of preventive screening received by children with SHCN (CDC, 2010; Minihan, Must, Anderson, Popper, & Dworetzky, 2011). A common conclusion for current research on the pediatric obesity and SHCN topic tends to focus on the need for further research investigating effective interventions (De, Small, & Baur, 2008). The identification of effective interventions and

its subsequent dissemination to pediatricians will positively impact accessibility for children with SHCN to evidence-based programs.

Initial examinations conducted to estimate obesity prevalence among children with developmental disorders were based upon the National Health and Nutrition Examination Survey (NHANES) 1999-2002 survey. This continuous national representative survey served as the data source for Bandini, Curtin, Hamad, Tybor, and Must (2005) in the evaluation of weight severity of children in the United States with a SHCN. After adjusting for age and race-ethnicity, children with developmental disabilities were identified as having the highest prevalence of being overweight (Bandini, Curtin, Hamad, Tybor, & Must, 2005). De, Small, and Baur (2008) conducted a retrospective study using the medical records of 98 children with disabilities. Researchers confirmed the result from previous studies that children with disabilities have a higher prevalence of overweight than children without disabilities. These outcomes in addition to national level data retrieved by the Center for Disease Control and Prevention, reflect the health disparities experienced by children with SHCN, requiring further investigations into effective methods of combatting such disparities (CDC, 2008).

The Role of Socioeconomic Status

As per the Center for Interdisciplinary Health Disparities Research (CIHDR) model the disparate burden of health outcomes is impacted by external variables such as socioeconomic status in addition to internal variables such as disability diagnosis-related limitations. Previous research reported a higher incidence of obesity and obesity-related chronic conditions are evident in children of minority or poor families (Crook & Peters,

2008). A more recent longitudinal study conducted in the United States supported this trend and demonstrated the impact of median house income level on obesity; the health care experience of low-income families varied from those who were not burdened by such financial constraints (Demment, Haas, & Olson, 2014). The disability population is considered to be a minority and underserved population; however there are limited studies that focus on the impact of economic status on the health outcomes of children with disabilities. A study conducted in Australia that researched obesity rates among children with intellectual disabilities reported, that while children with disabilities are at an increased risk for obesity, this risk is further impacted by socioeconomic disadvantage (Emerson & Robertson, 2010). Socioeconomic disadvantage reported by Emerson and Robertson (2010), included: area deprivation, income poverty, and material hardship. Exposure to such variables had a greater impact on obesity risk for children with intellectual disabilities (Emerson & Robertson, 2010).

The National Survey of Children with SHCN reported 20.9% of families are experiencing financial problems and strain, due to out of pocket expenses, and lack of employment stability when caring for their child with SHCN (Minihan, Fitch & Must, 2007). The economic stressors associated with caring for a child with a SHCN often place families at lower socio-economic levels than expected. For this reason, the present study was limited to low-income families, and families receiving the majority of their healthcare service through Medicaid insurance coverage or residing in counties that received a low income county rank based on NJ Median Household incomes.

Disparities Throughout the Lifespan

Improvements in public health practices and medical care have increased the life expectancy for people with and without SHCN. A 35-year prospective cohort study of 60,969 person-years concluded that individuals with a mild intellectual disability do not have a lower life expectancy than the general population, and tend to follow the same ageing process of the general population (Patja, Iivanainen, Vesala, Oksanen, & Ruoppila, 2000). Therefore it has become increasingly important to provide preventive health services to children and adults with SHCN in order to minimize the onset of chronic conditions that are often developed later in life. Obese children have an increased risk of becoming obese adults, for this reason it is important to understand the disparities of health outcomes experienced by adults with SHCN in order to apply an upstream preventive health approach that focuses on the barriers to care experienced by adults with SHCN who are obese or overweight (Minihan, Fitch, & Must, 2007).

A comparative study conducted by Haverkamp, Scandian, and Roth (2004) identified disparities in obesity outcomes experienced by adults with disabilities in North Carolina. The aforementioned study was conducted due to a constant overlooking of the health disparities of people with disabilities in public health research. An analysis of the health status of adults with disabilities revealed: lower levels of physical activity; inadequate levels of emotional support; and increased levels of high blood pressure, cardiovascular disease, diabetes, and chronic pain, in comparison to adults without disabilities (Haverkamp, Scandian, & Roth, 2004).

Reichard, Stolze, and Fox (2011) investigated the barriers faced by adults with disabilities when accessing health promotion and disease prevention programs. This nationally representative study based on the Medical Expenditures Panel Survey (MEPS) revealed that while adults with disabilities in the United States had a higher prevalence for chronic diseases, they were also less likely to receive preventive screening, and have higher health care expenditures in comparison to adults without disabilities (Reichard, Stolze, & Fox, 2011). The theory of reasoned action (TRA) can be applied as a theoretical explanation for why adults with disabilities are less likely to receive preventive health screenings. Based on high prevalence levels of chronic disease in the disability population, it would be expected that preventive screening and management efforts will be greater for people with disabilities.

The TRA and health belief model (HBM) provide an explanation that the low frequency of preventive screening despite high prevalence of chronic disease may be due to the individual beliefs of practitioners. Similar outcomes are expected to be identified for children with SHCN as a consequence of the beliefs in the priorities of health concerns for children with SHCN.

In order to decrease disparities the following cornerstones to health must be addressed in a universal manner: disease prevention, early detection, and health promotion. An improvement in medical care utilization will require increased training for healthcare providers so that they may provide chronic disease prevention and management services in a specialized manner, as well as improved Medicaid regulations

and rates of insurance reimbursements to incentivize providers to conduct preventive health screenings (Havercamp, Scandian, & Roth, 2004).

Current Obesity Management Practices

An analysis of clinician-based obesity management for 13,881 children in the United States revealed that 47% of girls and 44% of boys were advised by their pediatrician to eat healthier, and 36% of boys and girls were advised by their pediatrician to increase physical exercise (Liang, Meyerhoefer, & Wang, 2012). Such low rates of counseling can be attributed to limited obesity screening and counseling guidelines for pediatricians, and to parental socioeconomic status, as higher-income or higher-educated families are more likely to receive obesity counseling (Liang et al., 2012).

Low rates of obesity management also extend to adults, additional studies support the notion that the level of clinician-based obesity and overweight screening and management is surpassed by the prevalence of obesity and overweight among adults in the general population (Smith et al., 2011). Based on a national representative study of 1,211 primary care physicians in the United States, 49% of providers reported regularly reporting BMI levels of patients, less than 50% of providers reported providing obesity management guidelines for patients, less than 10% of providers reported referring patients to obesity management specialists, and less than 22% of providers reported systematically surveying their patients weight-related behaviors (Smith et al., 2011). With 90% of providers reporting ever referring patients for surgical procedures for obesity, it is clear that these providers have recognized high levels of weight severity among their patients (Smith et al., 2011).

It is important to note that low frequency rates of obesity management are not an indication that weight severity is a non-issue, contrary one the researcher theorized that providers may have a certain level of discomfort with weight-based stigmatization when discussing weight issues with their patients. Similar discomfort levels may be experienced by providers for children with SHCN. Collectively the aforementioned studies imply a need to provide increased obesity/overweight screening and management training to physicians, in addition to the need for physicians to network with community based health promotion professionals who can provide appropriate obesity management services.

The low rates of obesity screening and management for the general population prompt are an unfavorable precedent for obesity screening and management rates for children with SHCN. A retrospective chart review of 98 children reported the need for early detection and specialized obesity management as a plausible method for reducing weight severity experienced by children with developmental disabilities (De, Small, & Baur, 2008). The implications for practice emphasize the need to address the health maintenance and health promotion needs of children with primary chronic conditions (Chen, Kim, Houtrow, & Newacheck, 2009). Obesity management methods must be tailored to meet the individual needs of each child and their disability, thereby requiring increased levels of clinician training in addition to the formation of relationships between disability service providers and health educators.

Obesity Management Needs of Children With SHCN

Children with SHCN receive an assortment of coordination and support services in order to maximize quality of life. Despite this, preventive health services have not been included in the formal supports received by children with SHCN (Minihan, Must, Anderson, Popper, & Dworetzky, 2011). With a variety of needs and abilities, obesity management services for children with SHCN must be included and as individualized as the support service plan that is created for the child.

Telephone interviews conducted in a previous study to assess exercise and nutrition related difficulties experienced by children with autism spectrum disorders (ASD), revealed the importance of incorporating specific impairments in the development of obesity management programs for children with SHCN (Johnson, 2013). Individualizing obesity management programs requires an understanding of the impairments associated with specific disabilities. Children with ASD for instance may experience limitations in coordination, fine and gross-motor skills, swallowing or digestion (Johnson, 2013). A comparative study between children with epilepsy and their siblings without epilepsy revealed lower levels of physical activity in children diagnosed with epilepsy, with those with higher seizure frequencies being less active (Wong & Wirrell, 2006). With no studies indicating a significant correlation between epilepsy outcomes and physical activity, the low rates of physical activity among children with epilepsy revealed the need for health care providers to recommend physical activity in a manner that would not jeopardize the safety of the child, and takes into account the role of the family in promoting physical activity. The goal of Wong and Wirrel's (2006) study

was not only to compare physical activity and BMI between children with epilepsy and their siblings, but also to determine factors limiting physical activity levels in children with epilepsy. Wong and Wirrel (2006) reported the importance of knowing the limiting factors that affect physical activity in children with SHCN. Impairments in coordination may impact the ability for a child with a SHCN to exercise on a frequent basis; furthermore impairments in digestion may indicate a possibility of a hypersensitivity caused by certain foods (Johnson, 2013). It is important for clinicians to be aware of the impairments associated with certain diagnoses and the implications they pose on physical activity and diet when devising an appropriate obesity management plan. The limitations in such awareness may explain the theorized lower frequency of obesity management provided by clinicians for children with SHCN.

The inclusion of obesity management guidelines and policies within the formal supports services for children with SHCN will also require substantial cooperation from medical providers who are responsible for the provision of obesity management. A review of the literature revealed that there is no published research available pertaining to the frequency of clinician-based obesity management for children with SHCN. Therefore this study investigated the frequency of obesity management for children with SHCN in order to ascertain the need and scope of such guidelines. To combat possible health disparities experienced by children with SHCN, obesity management and obesity management policies must maximize opportunities for inclusive and specialized obesity prevention interventions while paying particular attention to low-income and minority children with SHCN (Minihan, Must, Anderson, Popper, & Dworetzky, 2011). Public

policy tools such as Healthy People (HP) have been utilized to improve health indicators. An analysis of the improvements made for children with SHCN over a decade was conducted using the Healthy People 2010 objectives and the 2003 and 2007 National Survey of Children's Health (NSCH) (Ghandour et al., 2013). The study revealed that throughout the decade children with SHCN continued to experience a greater burden of health disparities in comparison to children without SHCN. Furthermore they reported the need for increased surveillance of the health needs of children with SHCN in order to better understand the specific health challenges of a growing population (Ghandour et al., 2013). The needs for management of obesity in children with SHCN would be further met if the epidemiology of obesity in children with SHCN were better understood. For this reason there is an increased need for published literature investigating weight severity in children across the spectrum of SHCN's, as well as research identifying and validating current obesity management methods used for children with SHCN.

Individuals with SHCN, regardless of age, are often guided on a daily basis by family caregivers or caregiver staff. For the purpose of this study, caregivers will refer to the parent or guardian responsible for the coordination of care and well-being of the child. The success of weight management strongly depends on the caregiver's perception of their child's health status. The provision of a weight management program for youth residing in a group home reports an increased level of success in prevention strategies when caregiver staff were actively involved in the program. Involvement included receiving information on the weight status of the child, weight management education, communication tools, individualized wellness goals which included physical activity and

dietary recommendation, and monthly follow-ups (Gephart, 2012). With more than 80% of the youth achieving their wellness goal, Gephart (2012) demonstrated the benefits of actively involving the caregiver in the obesity management plan. Health care providers must recognize the reliance that children with SHCN have on their caregivers, and should subsequently assign caregivers with an integral role in the child's achievement of optimal health outcomes. To effectively provide a weight management plan for children with SHCN clinicians are advised to create an interdisciplinary team of providers that incorporate the skills of medicine, rehabilitation, assistive technology, health promotion and public health (Rimmer, Chen, & Hsieh, 2011). Referrals to a team of specialists can be considered an alternative approach for clinician-based obesity management that pediatricians may offer as opposed to direct counseling. This presents a viable option for clinicians who are not trained to effectively provide obesity management for children with SHCN.

Quantitative Studies based on Medical Chart Reviews

With approximately 91% of children with SHCN having health insurance, the use of medical charts as a data source provides a highly representative sample population (Minihan, Must, Anderson, Popper, & Dworetzky, 2011). It is important to note, children with SHCN see specialists more frequently than their primary care provider therefore this method of data collection is not always as consistent in the surveillance of weight severity or the delivery of obesity management as it is for children without SHCN (Strickland et al., 2004). Previous studies aiming to investigate weight severity for children with SHCN have relied upon the distribution of questionnaires to parents of

children with SHCN or national surveys such as the National Health and Nutrition Examination Survey (NHANES) (Andrews, Silk, & Eneli, 2010; Chen, Kim, Houtrow, & Newacheck, 2009; Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). To avoid the often cited limitations of recall bias reported in previous studies, this research utilized medical records as the source of data. Similar studies conducted pertaining to obesity management for children have assessed pediatrician performance through the retrospective review of medical records (O'Brien, Holubkov, & Reis, 2004). The analysis of medical records in the aforementioned study revealed that for obese children; 53% of visits documented obesity, 69% included adequate dietary history, 15% revealed information pertaining to sedentary living, 13% requested additional lab work, and during physical examinations only 39% noted obesity (O'Brien, Holubkov, & Reis, 2004). The success of this methodology in providing insight into pediatrician based obesity management practice indicates that this is a viable approach to use when investigating obesity management for children with SHCN. This retrospective research model also provided insight into obesity severity of children with SHCN.

Summary and Conclusions

The goal of this retrospective model was to evaluate obesity incidence in children with SHCN and to investigate the frequency of pediatric obesity treatment efforts in the medical setting for children with SHCN. A review of the literature indicated the need for improved education and training for providers so that they may appropriately provide obesity management to children with SHCN who are at risk for overweight or obesity. Furthermore this review ascertained that there is no published research pertaining to

obesity management and weight severity of children with SHCN within the clinician setting in the United States. Children with SHCN require tailored interventions that take into account the unique needs experienced by a specific diagnosis and its associated impairments. Therefore it is important that environmental and biological influences are taken into account when designing an obesity treatment plan for a child with a SHCN. Knowledge of the common barriers and needs associated with a specific disability, as well as evidence-based interventions for obesity management for children with SHCN will better assist providers in the delivery of preventive services. This literature review demonstrated that an investigation of obesity management from the clinician perspective through the review of medical records can provide insight into the clinician's capacity to effectively provide obesity management for children with SHCN. A retrospective comparative study of the frequency of obesity management for children with SHCN and children without SHCN indicated the need to focus obesity prevention activities for children with SHCN towards pediatric providers.

Chapter 3: Research Method

Introduction

The purpose of this study was to determine the frequency of clinician-based pediatric obesity management counseling provided to children with special health care needs (SHCN) in comparison to that which was provided to children without SHCN. It was also designed to identify the weight severity of children with SHCN through retrospective medical chart reviews. These reviews were used as a means to identify any correlations between obesity management counseling frequency and weight severity for children with SHCN. Two research questions were used to guide this investigation:

- RQ1: Is there a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey?
- RQ2: Is there a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey?

This chapter focuses on the methodology of the present quantitative research study design. It also provides insight into the data collection method, the selected data source, power calculations to identify the minimal sample size necessary in order to conduct a statistically significant study, sampling procedures, and data analysis methods. Identifications of threats to validity were conducted in order to protect the statistical integrity of the study design. Lastly, this chapter addresses any measures taken to preserve ethical considerations of study participants.

Research Design and Rationale

The present study was designed to answer two primary research questions using quantitative research. This observational study design utilized a retrospective chart review as the preferred method for data collection. Unlike self-reported questionnaire-based studies, medical chart reviews provide confirmation of disability status, in addition to unbiased weight severity status within a specified time frame in a manner that is not impacted by recall bias.

The primary variables for RQ1 were disability status as the independent variable and weight management counseling frequency as the dependent variable. In this study, disability status referred to the presence or absence of a physician-diagnosed SHCN in a subject's medical record. Weight management counseling frequency referred to the frequency of body mass index (BMI) screening, behavior modification recommendations, and specialist referrals received by each subject, as listed in the subject's medical record. Weight management counseling frequency was calculated using the quantity of visits within the predetermined timeframe as the denominator, and the subset of the denominator during which any of the aforementioned weight management counseling services were provided to the subject as the numerator.

The variables of interest for RQ2 were weight severity (the independent variable) and weight management counseling frequency (the dependent variable). Weight severity referred to the categorization of the subject as underweight, normal, overweight, or obese. A survey design approach was utilized to conduct the present study because each variable was quantitative in nature.

Table 1

Study Variables

Type of data	Specific Data Element	Type of Variable
Socio-demographic data	Age	Covariate
	Gender (Male or Female)	Covariate
SHCN status	Independent variable (Yes or No)	Independent variable
Health information	Height	Covariate
	Weight	Dependent variable
	Weight severity (Body Mass Index)	Dependent variable
Health Care services	Number of visits	Covariate
	Number of providers	Covariate
Obesity management services	Number of visits weight was reported	Dependent variable
	Number of visits excess weight was discussed	Dependent variable
	Number of visits weight management counseling was provided	Dependent variable
	Weight management counseling frequency	Dependent variable
Type of health insurance	Medicaid (Public), Uninsured, Private, Both public and private	Covariate

Target Population

The retrospective chart review was conducted at a medical center providing pediatric services in New Jersey. Federally qualified health centers (government medical centers that provide care to underserved populations) and hospital-affiliated medical centers in lower-income counties of NJ were approached to participate in the present study, due to their general population of low income families. A hospital-affiliated medical center was selected for the study as it ensured a large enough sample population for a statistically significant study, specifically for the SHCN sample group. Study participants were children with and without SHCN who visited the medical center on more than one occasion from January 1, 2012 to December 31, 2013, and who were aged 3-16 years at the time of their medical visit. The Medical Expenditure Panel Survey

reported that 13.3 million (17.9%) children under 18 years of age in the noninstitutionalized US population have a SHCN (Davis, 2011). Therefore a national sample size for a study focused on obesity counseling among children with special health care needs would require at least 2,485 participants (17.9% of 13,881). Dividing this figure among the 50 states resulted in a state-based sample consisting of approximately 50 participants with a SHCN.

Sampling and Sampling Procedure

A survey design was utilized that drew a sample of children from the children with SHCN population and the children without SHCN population. The purpose of this survey was to identify whether any variations occur in the frequency of obesity for both subgroups. Clustering procedures were used for sampling, with the first cluster being identified as children with a SHCN and the second cluster being identified as children without a SHCN. Convenience sampling was suitable for this study, because the subjects were selected based on the presence of a visit between the defined time frames of January 1, 2012 to December 31, 2013. Medical records were obtained based on inclusion criteria that determined eligibility for data collection.

Inclusion criteria for O'Brien, Holubkov, and Reis (2004) were children between the age of 3 and 16 years who were overweight or obese. The same inclusion criteria was utilized for the present study in order to ensure that the focus of the study was on obesity management among high-risk children. The criteria for categorizing obesity in children followed the Center for Disease Control & Prevention (CDC) definition of obese as a body mass index (BMI) > 95th percentile of weight-for-height for children of the same

age, and overweight being defined as a BMI > 85th percentile and <95th percentile of weight-for-height for children of the same age. Including children who were overweight also provided an opportunity to ascertain whether frequency of obesity management was higher in children who were overweight than in children who were obese. Children that met the inclusion criteria of the study were identified through the medical centers' databases.

As a comparative study between children with SHCN and children without SHCN assumptions such as the homogeneity of variance between both sample populations was met. To maintain external validity of the study, a statistically significant sample of children with SHCN in New Jersey was applied. Using G*Power 3.1.4 software, the sample size calculated for each population was 51. This was based on the *t* test with an effect size of 0.5, α level of 0.05, and a power of 0.80. Reviews of previously conducted studies and census data indicated that the study should include approximately 50 children with SHCN in NJ in order to be a representative study (Liang, Meyerhoefer, & Wang, 2012; Davis, 2011). For this reason, 50 children with SHCN and 50 children without SHCN were selected for inclusion in the study.

Procedures for Recruitment, Participation, and Data Collection

The data collection process for the present study featured medical chart reviews of selected children at a medical center in New Jersey in order to obtain information on the following variables: age, sex, SHCN status, height, weight, the frequency of BMI screenings, and weight management counseling (behavior modification recommendations) received within the 2-year period. Since Electronic Medical Records

were used at the Medical Center, de-identified charts were not available, therefore non-essential personal identifiable information was not recorded or reported for any subject. The medical center used for this study was selected based on the availability and accessibility of medical records for the target population. Each of the 21 counties in New Jersey has a Federally Qualified Health Center, furthermore New Jersey has a variety of Hospital-based medical centers located statewide. The Chief Executive Officers of Medicaid funded Federally Qualified Health Centers throughout the State of NJ, in addition to private medical centers and hospitals received information via email pertaining to the research topic allowing them to make an informed choice as to whether or not to participate in the study. Upon expressing interest in the research topic, the researcher scheduled meetings with key medical personnel at each medical center in order to further discuss the study, and the data collection process. Various methods were employed to recruit and identify the medical center for this study; these included sharing the proposal of this study with local medical centers and large hospital networks in order to obtain a statistically significant data set, and accessing pediatric providers through professional groups such as the Association of Pediatric Providers in New Jersey (AAPNJ). Medical records are a reliable source of data as providers are mandated to record each medical encounter and any information disclosed during each visit. Upon selection of the data collection site, an in-person meeting was scheduled with key medical personnel in order to ascertain the method in which medical records are charted and documented. The selected medical center had an Institutional Review Board (IRB) and an Institutional Research Committee (IRC), therefore a separate IRB application was

completed and approved by the medical center and by Walden University. In addition to this, an Observational Study Agreement was signed between the medical center and Walden University.

A standardized chart review data abstraction instrument was developed for the study to ensure that information pertaining to each variable was captured uniformly. Each variable in the data abstraction tool had a simple response section. The data abstraction instrument was electronic, allowing for a central source for all data collected at each site. Data collected included disability status of the subject, height and weight recorded at time of most recent obesity screening within the 2-year time frame, age, gender, the frequency of obesity screening and counseling received, for each subject within the 2-year time frame.

Missing variables for any subject were managed by the deletion of the participant from the study. Since casewise deletion of missing data impacts the sample size for the study thereby decreasing the power; prior to the omission, each subject was audited in order to determine any similarities amongst the participants with missing variables in comparison to eligible participants as this may reflect a potential area for bias in the study. Missing data in this study was determined as random and did not correlate to the research questions. Casewise deletion was the preferred method for managing missing data in the present study due to the small sample size; a statistically significant impact on the power of the study was not evident. It was important to ensure that the remaining eligible subjects presented a representative sample of the general population in order to protect the external validity of the study.

Data Abstraction Tool

1. What was the age of case # at the time of their last eligible visit?

2. What is the gender of case #?

M= Male

F = Female

3. Does case # have a diagnosed special health care need listed in their medical record?

Y = Yes

N = No

4. What was the height of case # at the time of their last eligible visit?

5. What was the weight of case # at the time of their last eligible visit?

6. How many visits has case # had during the eligible time frame?

7. How many different providers saw case # at this site during the eligible time frame?

8. How many visits reported weight of case # during the eligible time frame?

9. How many visits reported discussions about weight during the eligible time frame?

10. How many visits reported providing specific obesity management counseling during the eligible time frame?

11. What insurance does the case# have?

M = Medicaid

U = Uninsured

O = Other Private Insurance

Case #*	Obesity management counseling frequency for children with and without SHCN in NJ				
	1. Age	2. Gender	3. SHCN status	4. Height (in.)	5. Weight (lbs.)
	6. Visits	7. Providers	8. Weight reported	9. Weight discussed	10. Obesity management counseling
	11. Insurance status				

Figure 1. The data collection sheet. Case numbers were based on the order in which medical chart reviews were conducted and do not refer to any specific coding.

Data Analysis Plan

IBM SPSS Statistics 2.0 Software was used to analyze the collected data for the study and to answer the primary research questions:

The primary research questions addressed in the present study were:

RQ1: Is there a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey?

H_{1o}: There is no statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

H1_a: There is a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

RQ2: Is there a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey?

H2_o: There is no relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

H2_a: There is a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

The data analysis plan for RQ1 adopted a comparative study methodology between two populations; weight management counseling frequency for children with SHCN in comparison to weight management counseling frequency for children without SHCN. A *t* test was used to compare weight management counseling frequency between both sample populations. This method is preferred for a smaller sample population size. SPSS software was used to conduct an independent sample *t* test to conduct a comparative analysis between children with SHCN and children without SHCN. The level of significance for the study was $\alpha = 0.05$. A Levene's test for equality of variance that indicates a P-value (significance level) less than or equal to 0.05 results in the rejection of the null hypothesis. The goal of the *t* test is to reveal any discrepancies in

weight management counseling frequency between both sample populations.

Assumptions accompanying this analysis methodology included normality within the population samples, observations that were independent, and homogeneity of variance between the population samples.

The data analysis plan for RQ2 adopted a correlative study methodology to investigate the presence or absence of a relationship between weight severity and weight management counseling frequency for children with SHCN. A correlation analysis was conducted to determine whether there was a statistically significant correlation between weight severity and weight management counseling frequency for children with SHCN. The acceptance of the alternative hypothesis was determined by the P-value, while the strength of the correlation was described by the coefficient of determination, the r^2 - value. SPSS software was used to conduct a bivariate correlation analysis of the children within the SHCN population sample. The level of significance for the study was $\alpha = 0.05$. A P-value less than or equal to 0.05 results in the rejection of the null hypothesis. A limitation of the correlation analysis is that this analysis is non-directional. It is important to note that correlation does not imply causation; rather a correlation may suggest that the presence of one variable may contribute to a variation in the other variable, or that the presence of an external variable such as SHCN status may contribute to a variation in both variables. Assumptions accompanying this data analysis included; no error in the independent variable, normal distribution among the dependent variables, and independence among the variables.

Threats to Validity

The use of a standardized data abstraction instrument developed for the present study enhanced the internal validity and reproducibility of the study (Jansen et al., 2005). The collection of data from a provider's typical patient pool was more likely to include a more heterogeneous population that can be generalizable to the broader population, than a randomized controlled trial. This increased the external validity of the present study in addition to providing a true evaluation of current obesity management practices.

The present study had certain limitations, due to the nature of health needs of children with SHCN and the reliance on retrospective records as a data source. While a primary care physician may be considered as the primary provider for children without SHCN, previous studies indicate the increased reliance that children with SCN have on specialists (Strickland et al., 2004). Therefore the frequency of obesity screening for children with SHCN may have been impacted by a general lower frequency of medical visits to a primary care physician for children with SHCN in comparison to children without SHCN. This was addressed by recording frequency of obesity counseling as a percentage that takes into account the quantity of visits within the 2-year time frame.

With the primary data source of interest being a hospital-based medical center, there may have been a potential threat to external validity limiting the generalizability of the results. The medical-center selected was located in a low-income city in New Jersey that has a primary patient base of low income families who rely upon Medicaid for insurance coverage through the State Child Health Insurance Program (Crystal, Akincigal, Bilder, & Walkup, 2007). Therefore the outcomes of this study may not be

generalizable to all children with SHCN, especially those within a different socio-economic group than those selected for the present study. As a retrospective study, data collected was based solely upon what was recorded and available in the medical chart; this limited assessing external contributing factors to weight severity such as parental obesity.

Ethical Procedures

All research was conducted in a manner that is respectful of children with and without SHCN. Ethics approval from the IRB at Walden University was obtained prior to commencing any data collection procedures. This approval was shared with the medical center's IRB and IRC in order to attain approval for data collection. Requirements of the medical center's IRB included the researcher's successful completion of the Collaborative Institutional Training Initiative (CITI) Biomedical Research Course. The abstract, research proposal, methodology and the Walden University IRB approval was provided to the medical center in order to assure providers that ethical considerations for the study had been accounted for, in addition to confirming the protection of all reviewed medical records in accordance with HIPAA regulations. A Letter of Cooperation was approved and signed by the medical center in addition to a Data Use Agreement and an Observational Research Agreement.

The researcher received training on the electronic medical record system used by the medical center and was granted read-only access to the system. Data was collected during office hours at the medical center so that any necessary supervision for the review of medical records was readily available. Medical records were not printed, copied or

removed from the data collection site by the researcher at any time. Collected data did not include any personal identifiable information on any subject. In accordance with the research agreement, the name of the medical center or the medical providers will not be disclosed or disseminated. All data collected was anonymous and confidential in compliance with HIPAA regulations. Data was stored securely on the researcher's password-protected private laptop and can only be accessed by the researcher. Data will be destroyed within 5 years of the completion of the present study.

To avoid any conflict of interest, this research was not conducted within the work environment of the researcher, which is a community-based, service-providing agency for individuals with SHCN in New Jersey. Recruitment concerns for the present study included being granted permission by the medical centers to access the medical records and collect data.

Summary

This chapter included a concise description of the data collection methodology that will be used for the present study. A retrospective medical chart review was utilized to collect weight severity and obesity management frequency data on 100 children aged 3-16 with and without SHCN who received medical care from a medical center in New Jersey between January 1, 2012 and December 31, 2013. Data was collected in a manner that respected the rights and privacy of people with and without disabilities. In order to maintain ethical consideration, no personal identifiable information was collected. An electronic chart review data abstraction instrument was developed for this study and used

to collect the data at each site. Data collection commenced upon the approval from the IRB at Walden University and the medical center.

Chapter 4: Results

Introduction

The purpose of this retrospective medical records review was to assess weight management services received by children in the United States with special health care needs (SHCN) within the clinical setting. This was accomplished by conducting a comparative review between weight management counseling frequency received by children with SHCN and weight management counseling frequency received by children without SHCN. It was hypothesized that there is a significant difference in weight management frequency received by both groups. A correlative analysis was also conducted to examine the relationship between weight severity and weight management frequency within the SHCN group. It was also hypothesized that there is a correlation between weight severity in children with SHCN and the frequency of weight management received within the clinical setting. This chapter reports the statistical analyses results of the present study using tables to present the descriptive statistics, a t test analysis model, and a bivariate correlation analysis model.

Research Questions and Hypotheses

The primary research questions addressed in this dissertation study were:

RQ1: Is there a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey?

H1_o: There is no statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

H1_a: There is a statistically significant difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

RQ2: Is there a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey?

H2_o: There is no relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

H2_a: There is a relationship between weight severity (as measured by Body Mass Index) and frequency of weight management counseling among low-income children with SHCN in the state of New Jersey.

Data Collection

The researcher shared the inclusion criteria for the present study with the Electronic Medical Records Department at one hospital-based pediatric health medical center. A medical center in a low-income county of NJ was selected as the primary site for data collection. The medical center was selected for the present study due to the organization's pre-existing interest in pediatric obesity management research, large

number of pediatric practitioners providing services, and large patient pool of children with and without SHCN. Furthermore, the medical center was located in an urban city that has one of the highest poverty rates in New Jersey. Institutional Review Board (IRB) and Institutional Research Committee (IRC) approval were obtained from the Medical Center and IRB approval was attained from Walden University prior to the review of medical records and the collection of data.

Participants for the present study were selected based on the primary diagnosis listed in the Electronic Medical Record (EMR). Convenience sampling was conducted by the medical center's EMR staff by selecting the codes and dates of service approved for inclusion in the study. Each patient chart was coded using an electronic medical record number. Disability diagnostic codes and childhood obesity diagnostic codes were used to identify the medical records that reported a presence of a primary, secondary, or tertiary diagnosis of an intellectual/developmental disability, and/or childhood obesity. The convenience sample resulted in 4,860 medical records being identified as eligible for inclusion in this study.

Eligibility for inclusion was based on the presence of one or more of the following diagnoses: attention deficit hyperactivity disorder, autism spectrum disorder, behavioral disability, cerebral palsy, cognitive disability, developmental disability, Down syndrome, dwarfism, epilepsy, or learning disability, obesity or overweight. This information was provided to the researcher in a secure format that only included the electronic medical record number and the diagnosis codes of the subjects that met the inclusion criteria. Personal identifiers were not collected from the institutional records, so

as to protect the confidentiality of the patients. The researcher received read-only access to the electronic medical records so as to protect the integrity and accuracy of each patient's medical record.

Upon receipt of IRB approval from Walden University (IRB Approval #:10-10-14-0174824) and the Medical Center, the researcher randomly selected 50 medical records for the non-SHCN group based on medical record number and diagnosis code. All medical records eligible for inclusion in the present study were listed in a random order on one Microsoft Excel document, where each medical record was listed by medical record number and with the associated diagnosis codes for that patient. The researcher highlighted each medical record number that listed obesity and no SHCN, selecting every 25th medical record for the sample cluster of youth without SHCN. Inclusion in the study was then confirmed upon review of the Electronic Medical Record (EMR). Participants with missing variables were replaced by a randomly selected subject. Due to the high percentage of medical records that did not document race/ethnicity, cases with an unreported race/ethnicity were included in the study.

This process resulted in the selection of a sample of 50 subjects through clustering sampling by primary diagnostic codes for the SHCN group. However, only 3 subjects reported both a SHCN diagnosis and overweight/obesity as a diagnosis during the EMR department's initial retrieval of records. This initial sampling was conducted using the medical record number and the listed diagnosis codes. Using a different color than for the non-SHCN group, the researcher highlighted each medical record number that listed a SHCN as a diagnosis; every 25th medical record was then selected for the sample cohort

of youth with SHCN. A thorough review of the medical records was required in order to determine eligibility for inclusion in the SHCN cluster based on the presence of childhood obesity. For this reason, the researcher reviewed the EMR of the randomized sample of subjects within the SHCN group, and selected subjects that reported a Body Mass Index above the 85th percentile for age and gender.

This data collection process required me to spend 2 weeks at the medical center to review and collect data from the 100 participants' electronic medical records (EMR). This data was stored using the IRB-approved data abstraction tool. Upon completion of the data collection, all data was transmitted into SPSS for data analysis. The subjects were grouped into 2 clusters: the SHCN group and the non-SHCN group. In addition to this, the researcher input formulas into SPSS to allow for the calculation of weight management frequency for each participants. Subjects with missing data were deleted from the analysis and randomly replaced by another subject that fit within the inclusion criteria of the present study. The final sample size for the present study was 100 patients, of which 50 subjects represented the SHCN population.

Descriptive Characteristics

The researcher classified the overall sample population consisting of 100 patients at a single hospital-affiliated pediatric health center into two clusters: SHCN and non-SHCN (see Table 2). The gender distribution within the sample population ($N = 100$) was 43% male and 57% female. The gender distribution within the SHCN group ($n = 50$) was 46% male and 54% female, while the gender distribution within the non-SHCN group ($n = 50$) was slightly different with 40% male and 60% female.

The overall average age of the sample population ($n = 100$) was 9.5 years \pm 3.7 years, with the youngest being 3 and the oldest being 17 years of age (see Table 2). Average age varied between both groups; the group with SHCN ($n = 50$) averaged 8.9 years \pm 3.4 years, and the group with no SHCN ($n = 50$) averaged 10.1 years \pm 3.9 years.

A high percentage of participants ($n = 100$) in the present study identified themselves as either Black/African American (54%) or Hispanic/Latino (16%), 2% identified themselves as Asian, 3% identified themselves as White, and 25% did not report their race or ethnicity (see Table 2.). Within the SHCN group ($n = 50$); 56% identified themselves as Black/African American, 10% identified themselves as Hispanic/Latino, 2% identified themselves as Asian, 6% identified themselves as White, and 26% did not report their race or ethnicity. Within the non-SHCN group ($n = 50$); 52% identified themselves as Black/African American, 22% identified themselves as Hispanic/Latino, 2% identified themselves as Asian, and 24% did not report their race or ethnicity. Due to the high percentage of participants who did not report their race or ethnicity, this variable was not a determining criterion in the inclusion of a subject in the present study.

The majority of all participants ($n = 100$) within the present study had a Medicare/Medicaid health insurance plan (81%), with 10% having other private health insurance, and 9% being uninsured (see Table 2). Eighty-two percent of participants in the SHCN group ($n = 50$) had Medicare/Medicaid, while 80% in the non-SHCN group ($n = 50$) had Medicare/Medicaid. Twelve percent of participants in the SHCN group ($n = 50$) had other private health insurance, while 8% of participants in the non-SHCN group

($n = 50$) has other private health insurance. Six percent of participants in the SHCN group ($n = 50$) were uninsured, while 12% in the non-SHCN group ($n = 50$) were uninsured.

A descriptive analysis was conducted on the SHCN group ($n = 50$) to determine the distribution of SHCN diagnoses within the sample group. Twenty percent of the participants had a primary diagnosis of ADHD ($n = 10$), 10% had a primary diagnosis on the autism spectrum ($n = 5$), 8% had a primary diagnosis of a learning disability ($n = 4$), 18% had a diagnosis of a developmental disability ($n = 9$), 24% had a primary diagnosis of epilepsy ($n = 12$), 2% had a primary diagnosis of cerebral palsy ($n = 2$), 4% had a primary diagnosis of Down syndrome ($n = 4$), 1% had a diagnosis of dwarfism ($n = 1$), 1% had a diagnosis of a cognitive disability ($n = 1$), and 4% had a diagnosis of a behavioral disorder ($n = 2$) (see Table 3).

Table 2

Descriptive Statistics for SHCN and Non-SHCN Group

Descriptive Variable	Frequency ($n = 100$)	Frequency SHCN ($n = 50$)	Frequency Non-SHCN ($n = 50$)
Gender			
Male	43.0	46.0	40.0
Female	57.0	54.0	60.0
Age			
Mean (range)	9.49 (3-17)	8.9 (3-16)	10.08 (3-17)
Std. Deviation	3.700	3.424	3.901
Race			
Black/African American	54.0	56.0	52.0
Hispanic/Latino	16.0	10.0	22.0
Asian	2.0	2.0	2.0
White	3.0	6.0	0.0
Unreported	25.0	26.0	24.0
Insurance Status			
Medicare/Medicaid	81.0	82.0	80.0
Other Private Insurance	10.0	12.0	8.0
Uninsured	9.0	6.0	12.0

Table 3

Descriptive Statistics of SHCN Diagnosis

Diagnosis	<i>f</i>	%
ADHD	10	20.0
Autism	5	10.0
Learning Disability	4	8.0
Developmental Disability	9	18.0
Epilepsy	2	4.0
Cerebral Palsy	4	8.0
Down Syndrome	1	2.0
Dwarfism	1	2.0
Cognitive Disability	2	4.0
Behavioral Disorder		

Weight Severity

One hundred percent of the sample population was overweight, obese, or morbidly obese. The Center for Disease Control and Prevention, Childhood Body Mass Index Chart was utilized to determine the weight severity of each subject. Overweight is defined as a BMI greater than the 85th percentile and less than the 95th percentile by age and gender (Barlow et al., 2007). Obesity is defined as a BMI greater than the 95th percentile by age and gender (Barlow et al., 2007). While some medical records indicated that certain participants were morbidly obese, greater than the 99th percentile by age, the Center for Disease Control and Prevention, Childhood Body Mass Index Chart does not provide an option to calculate morbid obesity; therefore, this designation was not included in the analysis.

Eleven percent of the total sample population ($n = 100$) were characterized as overweight, and 89% were additionally characterized as obese, with an average BMI of $29.35 \text{ kg/m}^2 \pm 8.1$ and a range BMI of 17.5 at the lower limit to 53.2 at the upper limit (see Table 4). Twenty percent of the SHCN group ($n = 50$) were characterized as overweight, and 80% were characterizes as obese, with an average BMI of 26.9 ± 8.0 and a range BMI of 17.51 at the lower limit to 50.89 at the upper limit. Two percent of the sample population ($n = 50$) were only characterized as overweight, and 98% were characterized as obese, with an average BMI of 31.9 ± 7.3 and a range BMI of 19.5 at the lower limit to 53.25 at the upper limit.

Table 4

Weight Severity Frequency

Weight Severity	Sample Population ($n = 100$)	SHCN Group ($n = 50$)	Non-SHCN Group ($n = 50$)
Overweight	11.0%	20.0%	2.0%
Obese	89.0%	80.0%	98.0%
Mean BMI (kg/m ²)	29.35 (17.51-53.25)	26.85 (17.51-50.89)	31.86 (19.5-53.25)
Std. deviation	8.0887	8.0037	7.2606

Weight Management

An independent t test was conducted using SPSS software to compare the frequency of obesity counseling received by overweight/obese children with SHCN and overweight/obese children without SHCN. The level of significance for the present study is $\alpha = 0.05$. A Levene's test for equality of variance that indicates a P-value (significance level) less than or equal to 0.05 will result in the rejection of the null hypothesis. The

average incidence of weight management services received by the SHCN group was 1.0 ± 0.4 (see Table 5). The average incidence of weight management services received by the non-SHCN group was 2.0 ± 0.8 . Levene's Test for equality of variances was conducted between both groups resulting in a significance level of .000 which is less than the alpha level of 0.05; therefore equal variances cannot be assumed between both groups (see Table 6). The calculated t-value of this comparative analysis between the SHCN and non-SHCN group for weight management frequency is 7.826 with 81.836 degrees of freedom (see Table 7). The significance level of 0.00 is less than the p-value $\alpha = 0.05$ therefore we reject the null hypothesis for research question 1 that there is no difference in weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey. The *t* test revealed a statistically significant difference between the weight management frequency received by youth with SHCN ($M = 1.0$, $SD = .46498$) and the weight management frequency received by youth without SHCN ($M = 2.0$, $SD = .74975$), $t(100) = 7.826$, $p = .000$, $\alpha = .05$ (Table 7).

Table 5

Group Statistics for SHCN and Non-SHCN Group regarding Incidence of Weight Management Services

Variable	SHCN Group	<i>n</i>	<i>M</i>	<i>SD</i>	<i>SEM</i>
Weight Management Incidence	SHCN	50	1.0	0.46498	0.06576
	Non-SHCN	50	2.0	0.74975	0.10603

Table 6

Levene's Test for Equality of Variances

Variable	<i>F</i>	Sig
Weight Management Frequency	19.486	.000

Table 7

Independent Sample t test for SHCN and Non-SHCN Groups

	<i>t</i>	<i>df</i>	Sig (2-tailed)	Mean Difference	St. Error Difference	95% Confidence Interval	
						Lower	Upper
Weight Management Incidence	-7.826	81.836	.000	-.97640	.12477	-1.22461	-.72819

Note. SHCN = Special Health Care Need

Weight Severity within Special Health Care Need Group

A bivariate correlation analysis was conducted using SPSS software to determine a possible correlation between weight severity within the SHCN group and weight management frequency. The level of significance for the present study is $\alpha = 0.05$. The results of this analysis support the hypothesis for research question 2, indicating that there was a small, but significant association between weight severity and weight management frequency among children with SHCN, $r(50) = .287, p = .044, \alpha = .05$ (Table 8). The scatter-plot graph demonstrated a significant increase in weight management frequency as BMI increases within the SHCN group (see Figure 1).

Table 8

Bivariate Correlation Analysis for SHCN Group

		Weight Severity
Weight Management Frequency	Pearson Correlation	.287*
	Sig. (2-tailed)	.044
	N	50

Note. SHCN = Special Health Care Need

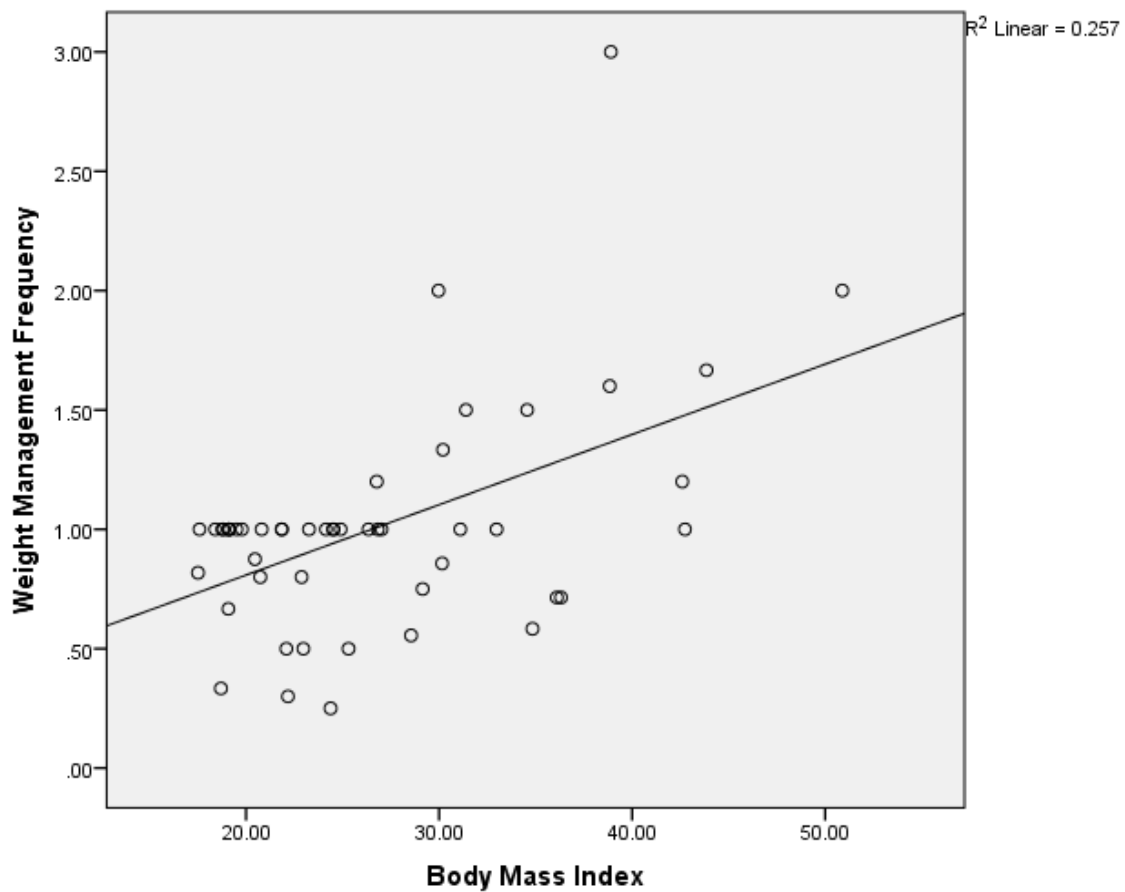


Figure 1. A scatter plot graph showing weight management frequency and BMI in the special health care need group.

Summary

An analysis of 100 medical records of children with and without SHCN revealed a statistically significant difference in the frequency of weight management counseling received between both groups. The *t* test analysis conducted supports the hypothesis that there is a difference with weight management counseling frequency between low-income children with and without SHCN in the state of New Jersey.

An analysis of 50 medical records of overweight/obese children with SHCN revealed a statistically significant correlation between weight severity and the frequency of weight management counseling received. The bivariate correlation analysis supported the hypothesis that there is a relationship between weight severity (i.e., Body Mass Index) and frequency of weight management counseling among low-income children with SHCN at a medical center in the state of New Jersey.

The results from the study indicate that the incidence of weight management counseling in the non-SHCN group was 2 times greater in comparison to the SHCN group, thereby rejecting the null hypothesis that the frequency of weight management services received across both groups is equal. The results from the present study also indicate a significant association between weight severity and the incidence of weight management counseling received among children with SHCN. It can be concluded from these results that while weight severity in children with SHCN is comparable to weight severity in children without SHCN, the method in which it is managed during a medical encounter varies between both groups. Chapter 5 presents an interpretation of the results reported in Chapter 4, in addition to a discussion of the positive social change

implications of the present study, and the researchers' recommendations for future research and practice.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to investigate weight severity in children with SHCN and to determine the presence or absence of variances in obesity management counseling received between children with SHCN and children without SHCN. Children with SHCN are often reported as experiencing increased barriers in accessing health promotion services, resulting in health disparities such as increased rates of childhood obesity (Center on Health Promotion Research for Persons with Disabilities, 2009). According to epidemiologic surveillance, children with SHCN have a 38% higher rate of obesity than children without SHCN (CDC, 2008).

Most obesity-related studies are focused on adults and children without SHCN; such studies have utilized retrospective medical records review to investigate obesity management practices in the clinical setting. Within disability-related studies, only a limited number of studies have focused on weight severity in children with SHCN. This study investigated two questions: if overweight/obese children with SHCN receive a different rate of obesity management in comparison to overweight/obese children without SHCN, and if there is a correlation between weight severity in overweight/obese children with SHCN and the frequency of obesity management counseling.

This study consisted of a retrospective electronic medical records review conducted at a single, hospital-based pediatric health center in a low-income county of New Jersey. This study site was selected in order to compare the incidence rates of obesity management counseling received by low-income children with SHCN compared

to low-income children without SHCN. One hundred electronic medical records were randomly selected for inclusion in the study, 50 of which were for children with SHCN, and 50 of which were for children without SHCN. When comparing both sample groups, the incidence rates of obesity management counseling were 200% higher among overweight/obese children without SHCN in comparison to overweight/obese children with SHCN. An additional investigation into the weight severity of children with SHCN and the incidence of obesity management counseling received by this sample group indicated a positive correlation with weight severity.

Interpretation of Findings

The focal point of interest in this study was weight severity in children with SHCN and the incidence of obesity management counseling available to children with SHCN. The review of 100 medical records revealed a statistically significant ($p = 0.00$) difference in the incidence of weight management counseling received by children without SHCN in comparison to children with SHCN. Children without SHCN received obesity management counseling at a rate that was approximately double the incidence of obesity management counseling received by children with SHCN. These findings were as predicted by the alternative hypotheses, which expanded upon previous reports that obesity management is not always a prioritized topic during primary care visits (Ko et al., 2008).

Previous literature predicted an under-management of obesity related conditions in children with disabilities due to an increased focus on the primary disability diagnosis (Chen, Kim, Houtrow, & Newacheck, 2009). The review of 50 medical records of

children with SHCN for the present study revealed that the primary focus of each medical encounter was on the primary disability diagnosis. The present study expands upon the aforementioned speculations, providing empirical evidence that children with SHCN do not have access to the same level of clinician provided obesity management counseling.

The analysis of weight severity among children with SHCN in the present study ($n = 50$) reflected higher rates of obesity (80%) than being overweight (20%). The distribution of weight severity for the present study aligned with previous findings in which children with one form of SHCN, ADHD, experienced a higher prevalence of obesity attributed to limitations in their ability to self-regulate food intake (Curtin, Bandini, Perrin, Tybor, & Must, 2005). Twenty percent of children in the present study were reported as having ADHD as their primary diagnosis. While the present study did not investigate the potential cause of overweight or obesity in each youth, some children with SHCN have an increased susceptibility to secondary conditions such as obesity due to the physiology of their primary diagnosis.

To ensure that the present study was truly representative of weight distribution among the special needs population, multiple diagnoses were included in the study. The high rates of obesity within the SHCN cohort supported previous findings, with 10% of children in the present study having been reported as having an Autism Spectrum Disorder (ASD) and 8% having been reported as having Down syndrome. This was in keeping with previous literature that reported that children with ASD and Down syndrome have a high prevalence of obesity within the SHCN population (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). In addition to this, 12% of the SHCN

cohort were reported as having epilepsy as a primary diagnosis; this representation of epilepsy in the SHCN population was anticipated due to existent literature that reported a correlation between weight gain and anti-seizure medications such as valproate (Chen, Kim, Houtrow, & Newacheck, 2009). Notably, 2% of the SHCN cohort were reported as having cerebral palsy as a primary diagnosis; cerebral palsy is not normally associated with children being overweight, but rather, with children being underweight (Rimmer, Yamaki, Davis Lowry, Wang, & Vogel, 2010). The broad spectrum of primary diagnoses reflected in this study illustrates a need to not only focus on the causative pathways of obesity in children with SHCN, but also on the multifaceted approaches available to combat such disparate health outcomes.

The present study was guided by a composite framework integrating four theories that hypothesized the impact of patient-provider interactions on health behaviors and resulting health disparities in children with SHCN. The Center for Interdisciplinary Health Disparities Research (CIHDR) Model provided a conceptual framework that encompasses the impact that the combination of population level determinants and disease level determinants may have on the disparate burden of obesity-related chronic conditions in children with SHCN.

The disparate burden of childhood obesity among children with SHCN or other chronic conditions has been attributed to multiple causes ranging from physiological and cognitive limitations, to the limited availability of disability-accessible health promotion resources. The epidemiology of obesity reflects the importance of recognizing the multidimensional nature of chronic conditions.

By including multiple diagnoses, the present study focused on population level determinants as opposed to disease level determinants, thereby contributing a new dimension to the disability and childhood obesity discussion. The CIHDR model recognizes the key role that medical practitioners play in transforming health outcomes in patients; however, the significantly lower incidence of weight management counseling provided to children with SHCN may indicate a lack of uniformity within the field with regards to managing chronic conditions in specialized populations. Despite relatively higher rates of obesity versus being overweight within the SHCN group and the non-SHCN group, the present study showed variances in the incidence of obesity counseling between both groups. This finding suggests that weight severity is a significant issue for children with SHCN, underscoring a need for an increased frequency in their obesity counseling services.

In accordance with the social cognitive theory (SCT), health behaviors are impacted by a constant continuum between an individual and their environment. For this reason, many obesity related studies are able to apply socioeconomic differences as a causative function in health disparities between multiple population groups. To decrease the impact of such socioeconomic and environmental differences, all participants within the present study were sampled from the medical records of one hospital-based medical facility within a low-income city in New Jersey. With the selected medical center being the primary site for medical care within the city, the present study was conducted under the assumption that all patients reside within the same city or a proximal neighborhood,

are exposed to the same external environment, and have similar socioeconomic backgrounds.

The assumptions were further supported with the collection of demographic data such as: insurance status and ethnicity. A review of insurance status indicated a synonymous proportion of Medicare/Medicaid beneficiaries among both groups; 80% of the non-SHCN group, and 82% of the SHCN group. A review of ethnicity indicated a synonymous proportion of participants being Black/African American; 54% of the non-SHCN group, and 56% of the SHCN group. Current obesity studies report higher rates of childhood obesity occurring in minorities and in children who are receiving state/federal benefits (Pan, May, Wethington, Dalenius, & Grummer-Strawn, 2013; Ogden, Carroll, Curtin, Lamb, & Flegal, 2010). The SCT allows for a prediction of health disparities based on differences between the interaction of environment, individual and health behaviors.

The socioeconomic similarities between both sample groups for the study decreases the potential impact of confounding variables that often predict health behaviors and contribute to health disparities (O'Dea & Wilson, 2006). Such findings call for an increased focus on the variables impacting health outcomes of children with SHCN such as self-efficacy, incentive motivation, facilitation and self-regulation, all of which are key variables in the SCT. With 20% of participants in the study having ADHD, the present study supports previous studies that report the impact of self-regulation on health behaviors in children with ADHD (Curtin, Bandini, Perrin, Tybor, & Must, 2005). Such

individualized needs reflect an increased importance for clinician-initiated obesity management counseling.

While weight severity was similar between both groups for the present study, there is evidence from broader population level surveillance that obesity risk is higher in children with disabilities (CDC, 2008). Level of risk can be determined not only by prevalence of a particular disease state but also by the availability of interventions to decrease susceptibility to the disease state and its progression. It is noteworthy to report that all participants in the study presented as overweight or obese during each medical encounter. In many cases the patient progressed from overweight to obese or from obese to morbidly obese during the timeline of the medical chart review. Due to the impact that risk susceptibility has on health behaviors, medical professionals are instrumental in relaying important health information and health risks to patients and their caregivers (Smith et al., 2011).

Despite similar levels of weight severity between children with and without SHCN in the present study, limitations in the provision of obesity management counseling in the SHCN cohort supports the argument that at the individual behavior-level, children with SHCN do not face the same level of risk as children without SHCN. The health belief model (HBM) supports the assumption that there is a correlation between the provision of obesity management counseling and the perceived susceptibility to obesity. It is possible that varying rates in obesity management counseling reported in the present study may be attributed to differences in the risk perception of obesity between parents of children with SHCN in comparison to children without SHCN.

The present study further supports the impact of risk perception by reporting a small but significant correlation between weight severity and obesity management counseling. Children with SHCN who were closer to the upper limits of obesity in the present study, received a higher incidence of obesity management counseling in comparison to those close to the lower limits. Such conclusions however will require further quantitative investigations that compare childhood obesity risk perceptions between parents of children with SHCN and children without SHCN.

Reporting low rates of obesity management counseling among children with SHCN, the present study expands on previous research that reports a lower emphasis on weight management in primary care physician counseling practices (Ko et al., 2008). Current literature highlights a trend in medical care for people with disabilities, in which the primary diagnosis is often the priority discussion during patient-provider interactions (Chen, Kim, Houtrow, & Newacheck, 2009). In the context of the present study, the theory of reasoned action may attribute such prioritizations during medical encounters to subjective norms (Glanz, Rimer, & Viswanath, 2008). The patient-provider interaction theory, highlights the impact that such medical encounters have on health behaviors, perceived susceptibility and the likelihood of new health behaviors being adopted (Glanz, Rimer, & Viswanath, 2008).

With the primary focus of both the caregiver and the provider being the primary disability diagnosis, the risk of a secondary chronic condition in a child with a SHCN may not be considered to be an imminent threat to the quality of life of the child. Furthermore, the physiological nature of certain disabilities is often characterized with

obesity being a subjective norm. This notion of a subjective norm decreases the likelihood of weight severity being considered a prioritized health issue during patient-provider interactions for children with SHCN.

Sufficient evidence indicates a correlation between physician's recommendations and increases in weight management health behaviors such as physical activity and healthy eating (Galuska, Will, Serdula, & Ford, 1999; Calfas, Long, Sallis, Wooten, Pratt, & Patrick, 1996). Current studies pertaining to diabetes management further support a correlation between health behavior and patient-provider interactions (Ciechanowski, Katon, Russo, & Walker, 2014). Due to the influence that patient-provider interactions have on the health behaviors of patients, it is unlikely that any substantial behavioral changes will be implemented by the patient or their family unless prompted by the medical provider. The notion that there is an interrelated impact on health disparities between subjective norms, susceptible risk perceptions, patient-provider interactions and health behavior are strengthened by the aforementioned theoretical frameworks and the outcomes of the present study. Such statistically significant gaps in the delivery of care at the individual level, are having a substantial effect on individual health behaviors within the SHCN population, resulting in population-level health disparities.

Limitations of the Study

The present study has several limitations associated with the methodology design. It was a retrospective study by design relying on the access to medical records of a highly risk population; children and people with disabilities are protected at a higher level than the general population in ethical research guidelines. Due to the study design, gaining

access to medical records proved to be a difficult task. For this reason, all medical records were obtained from one data source with a select group of practitioners that may or may not be representative of the medical field. In conducting a medical records review, the incidence of obesity management counseling could only be determined based on the documentation within the medical record. This may result in bias in the outcomes as it is not possible to ascertain whether or not all topics discussed during each medical encounter were documented in each medical record. As anticipated, different patterns in documentation were noted throughout the medical records, as each patient visited multiple practitioners.

Another limitation on the external validity of the study is the socioeconomic status of the sample population which was predominantly Black/African American and Hispanic/Latino with Medicare/Medicaid health insurance. Selection bias may also be a limiting factor in the external validity of the study, as all participants were reported as either overweight or obese. For this reason, the findings of this study cannot be generalized to all children with SHCN, but rather are limited to minority and lower socioeconomic children with SHCN who are obese or overweight.

Recommendations

The results of the study indicate the need for increased research on comorbidities and obesity related chronic conditions in children with SHCN, in addition to interventions that may combat the documented increased susceptibility to such secondary conditions. With increased epidemiologic surveillance being conducted regarding children with SHCN, future research should investigate the impact that such surveillance

is having upon obesity management practices and screenings. Furthermore, obesity management practices should be evaluated in adults with SHCN to determine whether there is an increased focus on quality of life and healthy aging in people with disabilities.

Chronic conditions and disabilities are not static disease states, therefore an increased investigation into the various components that impact variances in susceptibility at the population health level is recommended. Early issues of the Institutes of Medicine Report (IOM) report the need to avoid assuming that secondary conditions are a consequence of the primary disability diagnosis, but rather that functional status and activity limitations predispose individuals to varying levels of risk susceptibility (Wilber et al., 2002). This epidemiologic shift in the perceptions of health outcomes in people with SHCN should also be reflected within the current system of the delivery of care.

The recommendations for practice include increasing the awareness of and training among medical and allied health professionals, so that they may be equipped with the skills to effectively assess and reduce obesity risk among pediatric patients with SHCN. Continuing education activities such as the “Evaluating Physicians In their Communities” (EPIC) Model, currently provides training materials for recommended childhood obesity management techniques. The inclusion of evidence-based interventions for children with SHCN in EPIC would provide effective tools that may assist medical professions with better serving the overall health needs of their patients. With a high proportion of the sample population having epilepsy, it may be beneficial for pediatric Epileptologist’s to also engage in increased trainings that focus on the application of evidence-based obesity interventions for children with epilepsy and seizure disorders.

Positive Social Change Implications

The results of the present study may positively impact the public health sector on multiple fronts. The overarching goal of this study was to provide increased insight into the disparities of health outcomes experienced by children with SHCN. The obesity epidemic has called for an in depth investigation and surveillance of the specific influences that are increasing risk susceptibility among children with SHCN. With health disparities often being attributed to racial and socioeconomic factors, it was important to confound for these variables allowing for a true investigation of the impact of SHCN status. Conducting the present study in a low-income group, with a high percentage of participants being of minority decent, allowed for a focus on the preventive health care services being provided to children with SHCN.

There is a general lack of research available pertaining to the public health significance of health disparities experienced by children with SHCN. The literature review indicated a gap in the availability of empirical data pertaining to the management of the general health care needs of children with SHCN. While epidemiologic surveillance notes an increased prevalence of obesity among people with disabilities, there is limited research available that further investigates weight severity in children with SHCN. The present study will contribute to the current minimal literature and data available pertaining to children with SHCN.

The synonymous distribution of confounding factors within both cohorts, allows the present study to contribute to the available data that uses disability status as a variable of comparison. The results of the present study provide support for public health

practitioners and health promoters to focus on the upstream causes of health disparities experienced by children with SHCN. More specifically, the results of the present study provide data pertaining to health disparities experienced by low-income minority groups that are impacted by disabilities; there is limited literature pertaining to the intersection of race and disability. Increased research into this topic area will provide the data necessary to support policy changes that may positively affect the disparities in health outcomes experienced by children with SHCN.

While current literature and epidemiologic surveillance demonstrates an increased prevalence of childhood obesity among children with SHCN, this information has not been further investigated. A review of the literature indicated a need to provide evidence-based interventions to combat obesity in children with SHCN, however there are no studies that have investigated the provision of preventive/management services in the clinical setting. Following the trend of obesity research within the general population, the present study demonstrated the need for increased obesity management services in the clinical setting. In order to effect true change in the provision of obesity management services for children with SHCN, it will be important to provide increased training for pediatric practice teams, which includes general practitioners, specialists, nurse practitioners and registered dietitians.

When reviewing the medical records of children without SHCN, many times they were referred to the medical center's obesity counseling program which featured a nurse practitioner and a registered dietitian. Only one child within the SHCN group was referred to this same program. Follow up discussions with the practitioners in the medical

center reflected a need for the nurse practitioners to receive additional training so that they may be equipped with the skills and resources to provide effective obesity interventions for children with SHCN.

It is noteworthy to report that some children within the SHCN group visited their practitioner in the pediatric developmental center on multiple occasions during the medical record review timeframe. This indicates the need to provide evidence-based weight management intervention resources to specialists, thereby expanding the scope of care provided by developmental disability specialists. The results of the present study support the general need for not only increased evidence-based obesity interventions for children with SHCN, but also an increased need for trainings for current and future health practitioners so that they may better manage the impact of secondary chronic conditions in their special needs patients.

Such aforementioned trainings should not be limited to pediatric practice teams, however as it is probable that similar trends are present among adults with SHCN. The epidemiologic shift in disability and health in which disability is no longer a definition of ill health, should also be reflected in healthcare and public health practices. It is becoming increasingly important for practitioners to focus on quality of life of children with SHCN, as opposed to solely focusing on disability management or curing a special health care need.

Obese children are at an increased risk of becoming obese adults, which may put adults with SHCN at a greater risk of obesity-related chronic conditions. The results of the present study supports the need for an increased focus on the general health care

needs and health related quality of life of children with SHCN. The increased life expectancy of people with SHCN also calls for further research into the causes of mortality within the disability population, as people with SHCN are now outliving the parents and living with aging-related comorbidities (Minihan, Fitch, & Must, 2007).

Observing the low rates of obesity management counseling provided to children with SHCN in a low income city of New Jersey, and the subsequent epidemiological surveillance reporting high rates of obesity within this cohort; the present supports the need for further investigations into the impact of patient-provider interactions. With previous studies reporting a correlation between patient-provider interactions and patient health behaviors, the results of the present study supports the need for increased sensitivity towards the detection and management of obesity in children with SHCN. Current childhood BMI charts that are calculated based on age, gender and weight, do not take into account the differences in body composition experienced by children with specific diagnoses such as Down syndrome. While the National Center for Health Statistics has designed growth charts specifically for children with Down syndrome that are adjusted to the reduced linear growth velocity, these charts are not readily accessible, have only been developed for specific diagnoses and are not used within electronic medical records which automatically calculate BMI.

School nurses in certain states are presently permitted to screen for childhood obesity and to send recommendations home to the families, however it is unclear as to whether or not school nurses have access to such adjusted BMI charts. Future studies are recommended to assess the knowledge and access that health practitioners in the clinical,

school and public health sectors have to adjusted BMI charts. To improve healthcare practices, effective weight screening measurement tools that are tailored for a specific diagnosis and its level of associated limitations must be developed and promoted among all health-related professionals. The development and validation of such tools will provide an additional resource for practitioners aiming to address weight severity in their special needs patients. Such an improvement in health prevention practices may result in improved patient-provider interaction and subsequently, improve health outcomes in children with SHCN.

The results of the present study will positively contribute to the current literature available pertaining to health care in children with SHCN. By raising awareness with regards to the essential health needs of children with SHCN. With a higher proportion of children within the SHCN being obese and morbidly obese in comparison to overweight, the present study indicates a need for transformations in the manner in which the general health care of children with SHCN are addressed both in the clinical and public health arenas.

Increased awareness of the high susceptibility that children with SHCN have to obesity is required in order to develop new recommendations for obesity screening and weight management in children with SHCN. This requires a multi-faceted approach that addresses not only the provision of resources and appropriate screening tools for clinicians, but also by addressing environmental factors that are creating barriers to health promotion services for children with SHCN. Future recommendations include the need to conduct a longitudinal study that addresses the health outcomes experienced throughout

the lifespan for children with SHCN. Such future research may lead to transformations in governmental healthcare coverage that advocate not only for the provision of essential health benefits for people with SHCN, but also for additional weight management services tailored specifically to meet the needs of children with SHCN who are overweight or obese.

Conclusion

The needs of children with SHCN are often addressed within the clinical setting, due to the specific needs of each diagnosis and its associate comorbidities. Improvements in the healthcare system both curative and preventative have resulted in an increased lifespan within the special needs population. In order to ensure that people with SHCN are aging in healthy manner, preventive health practices should be applied and tailored to meet the specific needs of this population. The present study revealed discrepancies in the management and prevention of obesity within the special needs population in a low income city in New Jersey, which is reflective of the limited access that clinicians may have to effective tools and resources for the management of secondary conditions in children with SHCN. However, the small but significant correlation between weight severity and weight management counseling reported in the present study is indicative of measures that clinicians in a low income city in New Jersey are taking to manage weight severity in morbidly obese children with SHCN. With the public health discussion transforming to an increased focus on the achievement of optimal quality of life within all population groups, the present study indicates the importance of ensuring that people with SHCN are identified as a minority population group that has a high susceptibility to

secondary conditions. This increased risk to secondary conditions must be combatted using evidence-based interventions and measurement tools that are tailored and validated to meet the needs of overweight and obese children impacted by a special needs diagnosis. Such recommendations are applicable in both the individualized clinical setting and at the population health level.

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Appendix A: Data Abstraction Tool

1. What was the age of case # at the time of their last eligible visit?

2. What is the gender of case #?

M= Male

F = Female

3. Does case # have a diagnosed special health care need listed in their medical record?

Y = Yes

N = No

4. What was the height of case # at the time of their last eligible visit?

5. What was the weight of case # at the time of their last eligible visit?

6. How many visits has case # had during the eligible time frame?

7. How many different providers saw case # at this site during the eligible time frame?

8. How many visits reported weight of case # during the eligible time frame?

9. How many visits reported discussions about weight during the eligible time frame?

10. How many visits reported providing specific obesity management counseling during the eligible time frame?

11. What insurance does the case# have?

M = Medicaid

U = Uninsured

O = Other Private Insurance

Case #*	Obesity management counseling frequency for children with and without SHCN in NJ				
	1. Age	2. Gender	3. SHCN status	4. Height (in.)	5. Weight (lbs.)
	6. Visits	7. Providers	8. Weight reported	9. Weight discussed	10. Obesity management counseling
	11. Insurance status				

*Case number is based on order in which medical chart reviews is conducted and does not refer to any specific coding.