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Health Care Provider Perceptions of High Blood Pressure Screening for Asymptomatic African American Teens

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Abstract

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Dissertation Submitted in Partial Fulfillment
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Abstract

Health care provider perceptions of typical practices play a significant role in evaluating the efficacy of screening and diagnosis of teen high blood pressure in African Americans. African American adults are more likely to develop high blood pressure than are any other ethnic group; however, there is a gap in the literature concerning high blood pressure in teens. Approximately 1 to 5 of every 100 children has high blood pressure. This purpose of this phenomenological study was to explore the perspectives of health care providers on high blood pressure screening and diagnosis of African American asymptomatic teens. The health belief model (HBM) was the conceptual framework used to describe how beliefs and attitudes influence provider high blood pressure screening. Purposive sampling resulted in 9 health care providers (8 pediatricians and 1family medicine physician), who completed a hypertension survey and individual interview. Data were coded and analyzed using thematic analysis. Atlas.ti was used for data management. Theoretical saturation was reached after 9 interviews. Emergent themes included observations from the participants that the absence of initial standardized high blood pressure screening for teens is a significant problem and that age-appropriate high blood pressure resources are not used consistently. Study results contribute to social change by providing an opportunity for heightened awareness and education among health care providers in teen high blood pressure screening and diagnosis processing. Ongoing education and research may engender proactive steps to develop universal guidelines, tools and practices to consistently and accurately detect high blood pressure in teens.

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Dedication

All praises to God; Psalm 86:12 says, “I give thanks to you, O Lord My God with my whole heart; and I will glorify your name forever” (King James Bible, unk). Words cannot express how grateful I am for this journey and to reach my goal of completing this dissertation. God is good all the time; and all the time God is good.

This dissertation effort is dedicated to my Heavenly Father, who made this moment possible. To my immediate family; to Larry, Tristian, Tory and Tukari for allowing me the time, solitude and space to fulfill my dream; your love and prayers meant a lot to me during this time. To my sister, Loretta, who became my editor, proofreader and prayer warrior, thank you for your support.

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Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction to the Study

Perceptions influence action; health care providers are influenced to make diagnoses based on their knowledge and experience, using established guidelines to interpret signs and symptoms. High blood pressure (HBP) in children and teens can be difficult to diagnose. HBP in teens was often overlooked by physicians and other health care providers. Teenagers who do not exhibit the traditional markers of hypertension (HTN), which are being overweight or obese are improperly screened or not screened at all. To recognize this phenomenon, understanding the screening process for asymptomatic teens in a variety of clinical settings can be instrumental in the early identification and detection of cardiovascular disease (CVD) and HBP. The first clinician a teen encounters is a health care provider; therefore, it is important to understand their perceptions of the appropriate screening tools and protocols for teens that may or may not exhibit clear indicators of HBP.

The Mayo Clinic (2013) suggested that HBP in younger children has been linked to genetics or secondary medical issues such as kidney disease or heart defects, but in older children, the link remains unknown. Essential or primary HTN occurs on its own, has a link to a family history of HTN or is the result of obesity. Secondary HTN has an underlying medical condition that contributes to HBP. In a study completed and presented at the American Society of Hypertension in 2006, researchers compared single blood pressure readings taken 2 years apart. The researchers found that there was a linear increase - from normal blood pressure to pre-HTN to HTN - in the percentage of adolescents classified with HTN at the second examination. The data have shown that the progression of pre-HTN to HTN is approximately 7% per year (Moser, Giles, Falkner, Schwartz, & Townsend, 2005; American Society of Hypertension, 2006). who know they have pre-HTN or even HBP can most likely avoid needing to take medication and developing complications of HBP if they make some changes to their diet and lifestyle now (WebMD, 2006).

The American Heart Association (AHA) reported that African Americans are predisposed to developing HBP and heart disease more than any other ethnic group. This predisposition may be due to higher rates of obesity and diabetes, which place African Americans at greater risk. Researchers have also found that there may be a gene that makes African Americans much more sensitive to the negative health effects of salt. This trait increases the risk of developing HBP. In people who have this gene, as little as an extra gram of salt could raise blood pressure as much as 5 millimeters of mercury (mm Hg) (AHA, 2014). HBP is more severe in African Americans and it also occurs earlier in life, thus affecting African-American children and teens at much earlier ages.

Early detection of HBP in teens can be difficult. This is due to varying methods of determining pre-HTN and HTN. Many HBP charts are either designed for children or adults, with teenagers at the high end of the children’s chart and the low end of the adult charts. Researchers have suggested that there is a gap in the literature regarding teenagers who are neither children nor adults and for teenagers who are asymptomatic and who appear otherwise healthy. It is important for health care providers to follow consistent screening methods to diagnose HBP that takes into consideration the teen's age, height, weight, family history and blood pressure percentile score.

To that end, I sought to understand the perceptions of health care providers surrounding the screening practices used to detect HBP in asymptomatic teens. I sought to understand from the health care providers' perspectives the screening tools used to detect teen blood pressure based on the provider experience with the current screening methodologies.

Background of the Study

Adolescence is characterized by profound changes in physical, psychological, and social functioning (Meininger et al., 2004). The stress of the changes in teen bodies, does affects their blood pressure, sometimes to alarming degrees. Teens are developing HBP at alarming rates, which may be due to conditions beyond their control including having a low birth weight at delivery. High rather than low birth weight may be related to a higher blood pressure in late pubertal black children (Li, Huang, Cruz, Goran, 2006). Worldwide, African Americans not only have the highest prevalence of HBP but also have the most severe HTN, more hypertensive target organ damage and perhaps an earlier onset of HTN. These findings are typically true of African Americans in the United States. Though agreed upon in adults, the emergence of ethnic differences in blood pressure during childhood is more controversial (Samuels, Bell, & Flynn, 2013).

The blood pressure levels seen in children is a reliable indicator of what their blood pressure level will be as an adult (Akgun et al., 2010). There are multiple (preventable and non-preventable) factors that determine the blood pressure level in childhood, which will define adult blood pressure; these can include family history, hereditary, dietary, and others. Teens are commonly screened for HTN if they possess the qualifiers for common risk assessment factors. These factors include an elevated body mass index, low birth weight, male sex, ethnicity and a family history of HTN (Moyer, 2013). Establishing screening practices for all teens, regardless of the risk factors presented at routine or emergency clinical appointments may be a viable tool in minimizing the development of CVD as an adult. Screening should be accomplished early in childhood throughout adulthood especially if there are factors identified so that the damage can be minimized (Bucher, Tschumi, & Simonetti, 2012).

History and Development of Screening Practices for Teen HBP

Early consistent and reliable screening practices can be a vital tool used to reduce the number of teens diagnosed or misdiagnosed with HBP. Because of the varied screening methods use locally, regionally and nationally, researchers are advocating that school aged children be screened at every clinical examination (Akgun et al., 2010; Badeli Sajedi, & Shakiba, 2010). This screening is based on age, gender, and body size (whether pear or apple shape), which are the main determinants of blood pressure in children, as well as weight, height and family history (Badeli et al., 2010).

Early detection and prevention plays a major role in helping African-American teens with controlling their HBP and to make a change in their lifestyle and behavioral choices (Covelli, 2006; Falkner, Lurbe, & Schaefer, 2010). The number of teenagers diagnosed each year in the United States with HBP was estimated to be at least 1 in 20 in the United States (Helen, 2004). African-American teens are twice as likely to develop HBP in their early adulthood as other ethnic groups are (Covelli, 2006). Screening is important in determining HBP especially in teens. A simple formula to screen for HBP in children and teens was developed. Age, gender, and body size are the main determinants of blood pressure in children, but now other screening factors are used to screen for HBP; these include weight, height, and family history (Badeli et al., 2010).

The primary concern of this study is that asymptomatic teens are not screened at an early age. The gap in literature in this area demonstrates that if HBP is not controlled in children, it will be problematic as an adult and increase the risk for adult CVD (Moyer, 2013). Early screening practices are vital to a reduction in teens diagnosed with HBP. There are multiple (preventable and non-preventable) factors that determine the blood pressure level in childhood that will define adult blood pressure. Screening should be accomplished from childhood through adulthood where risk factors can be identified and minimized (Bucher et al., 2012).

Prevalence of Adolescent HBP

Estimates for the prevalence of HBP among children and teens are in the range of 3% to 5%, with higher rates in certain subgroups. A school BP screening program conducted in Houston, Texas, in 2003 to 2005 found that among 6,790 adolescents (aged 11–17 years), 15.7% had pre-HTN and 3.2% had HTN (based on three separate BP readings). The frequency of HBP was much higher among obese teens, with rates of HTN and pre-HTN in excess of 30% in obese boys (42% among Hispanics) and 23% to 30% in obese girls (rates varied depending on ethnicity) (Falkner, 2006). Some teens may inherit the tendency toward higher blood pressure from one or both parents. Although HTN can be genetic, some people with a strong family history of HBP may never develop it.

This rise was partially because of the increasing prevalence of obesity among children and teens, as well as a growing awareness of this disease (Covelli, 2006). Almost 60 million Americans age 6 years and older have HBP. Teenagers in the United States now weigh more and exercise less than teens of past generations. As a result, HBP among teens has increased. A large authoritative study showed that HBP in teenagers increased from 1% to 5% between 1989 and 2002 (Weber, 2013).

Problem Statement

HBP in the African-American ethnic group is a public health problem and has been for many years (Paul & Ostfield, 1965; Boston University School of Medicine, 1948). The study of HBP in African-American adults began with the 1948 Framingham Heart Study. Adults have been the focus of many studies; now children are being researched to determine the origins of HBP. African American adults are more likely to develop HBP than any other ethnic group; however, there is a gap in the literature concerning HBP in children, particularly adolescents or teens. Many studies suggest that this may be due to screening practices and health care provider's perceptions of how often to screen for HBP in this population (Rodriquez Mowrer, Romo, Aleman, Weffer, & Ortiz, 2010). The U.S. National Heart, Lung and Blood Institute (NHLBI) guidelines (2012) recommended certain tests to effectively diagnose teen HBP. According to a recent study the institute conducted, less than one in four teens with HBP receives the recommended tests, which include an electrocardiogram (EKG). The institute found that the most common test used for adolescents was the EKG, a non-recommended test, and that the recommended tests were infrequently used. The institute researcher recommends that HBP in teens should not be taken lightly due to the increases of risk for heart disease and other medical problems.

University of Michigan researchers noted that health care providers may try to explain away HBP in teens, reasoning that the teen may exhibit a higher than normal blood pressure based on a fear or nervousness of medical professionals or the teen is worried temporarily about something else. In addition, the researchers identified a problem with health care provider training and knowledge base in identifying teen HBP. Physicians and other health care professionals may not be aware of the guidelines published by the U.S. NHLBI. Better training and education of physicians and health care providers is needed to understand how best to use diagnostic tests for kids with HBP (Yoon, 2012).

If the problem is left untreated, screening symptomatic and asymptomatic teens with HBP can morph into an epidemic of adults with CVD. Treating teenagers with HBP in their youth will positively affect their health as they age. If left untreated, a positive correlation has been made between the number of risk factors identified at the ages between 12 and 18 years and carotid artery wall thickness at ages 33 to 39 years (Rodriquez et al., 2010).

Many chronic diseases clearly pose a threat to life, but they can be managed. Chronic degenerative diseases, especially heart disease and cancer, are the leading causes of death in the United States (Schneider, 2011). These types of diseases tend to develop within a longer period of time, making it difficult sometimes to pinpoint the cause. Adult CVD has been linked to early childhood or teen HBP that has continued to be present throughout a teenager's life. Teens with blood pressure readings that are higher than 90% of the expected range are three times more likely than those with average readings to develop HBP as adults (Weber, 2013).

Purpose of the Study

The purpose of the study was to explore the gap in literature by understanding the perspectives of health care providers who diagnose symptomatic and asymptomatic HBP in teenagers between the ages of 13 and 17 years. Health care providers not only include physicians, but also physician assistants or nurses; those qualified to deem a teenager hypertensive. According to the U.S. Preventative Task Force (2013), although HBP is common in adults, up to five in 100 children and teens have HBP.

The central phenomenon of this qualitative study was to understand the health care provider perceptions for using specific screening criteria based on his/her teen population with symptomatic or asymptomatic HBP. Additional purposes include understanding the screening criteria used diagnose HBP as well as understanding the providers' perceived competence in diagnosing HBP in teenagers. The last purpose was to better understand the providers' insight as to what actions should be taken to help teenagers understand what HBP means in relation to CVD. Knowing providers current perceptions of their expertise and knowledge base of leading national guidelines and diagnostic requirements will allow for improvement in developing consistent and accurate screening protocols.

Research Questions

The primary research question (RQ) in this study was what are the perceptions of the health care provider when screening an asymptomatic teen for HBP? Specifically, the research questions (RQ) were as follows:

RQ1: What are the perceptions of health care providers regarding diagnosing teen asymptomatic HBP?

RQ2: What are the perceptions of health care providers regarding their capability to diagnose asymptomatic HBP?

RQ3: What system-based actions do health care providers think are necessary when addressing asymptomatic HBP in African American teens?

RQ4: What resources are currently available to share with parents on asymptomatic HBP?

Theoretical Framework

The phenomenological approach includes a common meaning for several individuals of their lived experiences (Creswell, 2014). For this study, the emphasis or phenomenon will be explored in terms of a single concept or idea, adolescent HBP and health care providers' perception of screening for asymptomatic HBP. In Chapter 2, I discuss why it is important to assess the screening practices for asymptomatic teens; one major importance is using consistent screening tools and guidelines for all teens, no matter their risk factors for HBP (Zhang &Wang, 2014; Cao, Cheng, & Wang, 2014).

A theory used to analyze HBP is the Health Belief Model (HBM) (Creswell, 2014). The HBM was developed in the 1950s and is one of the most widely used models for changing health behaviors. HBM contains four key perceptions that can predict why people will take action to change their health behavior: (a) perceived susceptibility to and severity of disease, (b) perceived benefits, (c) perceived barriers and (d) perceived self-efficacy. *Perceived susceptibility* is the belief about the probability of acquiring a condition or disease and the degree of severity, *Perceived benefits* refer to the benefit of acting on or changing a behavior, *Perceived barriers* refer to that which is stopping or interfering with the change, and *Perceived self-efficacy* is confidence that a change can take place (Glanz, Rimer, & Viswanath, 2008).

For adolescent HBP, the first step was recognizing that the individual has the disease, then understanding the degree or severity of his or her HBP reading. The teen will then either act to change the behavior or not. The teen must also understand whether barriers prevent him or her from receiving treatment, including access to health care. Lastly the teen must have confidence that he or she is doing what they can to combat HBP and that they have this disease under control. The main tenet of HBM was to understand why people change or resist change when the individual was exposed to a health behavior or condition that affects them personally.

The HBM theorizes that people’s beliefs about whether they are at risk for a disease or health problem, and their perceptions of the benefits of taking action to avoid it, influence their readiness to take action (Glanz & Bishop, 2010). People take action when they believe that the disease or health problem directly affects their lives. Health care providers' perceptions affect how they diagnose and treat HBP. Screening tools are used based on the provider's knowledge of the tool and effectiveness. This was the basis of this research: understanding what screening tools are used, when they are used and why they are used for the diagnosis and treatment of asymptomatic HBP.

HBM has direct relevance to a health care provider's perceptions on when and how to diagnose teen blood pressure and how it affects the African American community (Cao Chen, & Wang, 2014). The component of a community-based education program includes the community, school and family to provide health education to students. This education includes injury prevention and understanding the threat perception as well as completing a behavior evaluation. Threat perception includes two components, susceptibility to an injury and anticipated severity of the consequences of an injury. Behavioral evaluation consists of two distinct sets of beliefs: those related to barriers to change injury related risk behaviors and those concerning benefits. In addition to threat perception and behavioral evaluation, a "cues to action" component was also included in the HBM. Cues to action refer to triggers to change injury related risk behaviors (Cao et al., 2014).

The HBM model has been used to assess perceived benefits and as well as perceived barriers that would prevent teens from changing their mental health status (O'Connor, Martin, Week & Ong, 2014). HTN is partly a mental health issue. Teaching teens to understand the benefits and barriers on how to control diagnosed HBP while they are young, will help to mitigate HBP control issues as they age. Screening was an important part of that education.

Explaining adherence to self-care behaviors helps teens manage their HTN. Common sense regulation can be explored to determine its viability with teen HTN (Jones et al., 2014). Educating adolescents about the severity of HTN can be accomplished using the HBM model. This can be accomplished by explaining the dangers of HTN specifically CVD. An implementation plan can be developed for the teens to follow to gain experience with self-regulating to control and monitor their blood pressure.

Nature of the Study

The nature of the study was a qualitative method using a phenomenological approach. This method used interview and observation data to demonstrate how the group shares a cultural identity and patterns of behavior through time (Creswell, 2014). The phenomenological approach allows the participants to share their lived experience with the researcher. This method can effectively analyze the perceptions of health care providers and their current perceptions of screening protocols and priorities in African-American asymptomatic teens.

Definition of Terms

*Pediatric hypertension: Hypertension (*HTN) in children is defined as systolic or diastolic (BP) value of greater than or equal to the 95th percentile for age, gender and height after for three BP screenings (Flynn, 2013).

Pediatric pre-hypertension: Pre-hypertension (pre-HTN) was defined as at least 1 BP between the 90th percentile and <95th percentile (or ≥ 120/80 mm Hg even if lower than the 90th percentile) (Koebnick et al., 2013).

Primary pediatric hypertension: Primary hypertension was defined as ambulatory BP >95% for height and sex not attributable to another cause.

Secondary pediatric hypertension: Secondary hypertension was defined as elevated BP attributed to another cause, which includes, but is not limited to diabetes, kidney disease or end stage renal disease (Leisman et al., 2014).

Obesity: Widely used thresholds for being overweight or obese in childhood are: 110% or 120% of ideal weight for height; weight-for-height *Z* scores of higher than 1 or higher than 2; and BMI at the 85th, 90th, 95th, and 97th percentiles (Han, Lawlor, & Kimm, 2010).

Assumptions

Self-reported measures were used in addition to objective measurements (e.g., blood pressure, height and weight); an assumption was made that the health care providers participating in this study would give truthful answers and that their answers would be truly representative of their current and past practices, behaviors, and attitudes.

Limitations

The results may not account for the regional trend in the increase of adolescent HTN in normal weight or non-obese African-American teens; data were secondary data obtained from secondary sources, and expectations that a sufficient number of teens would have conclusive data available. However, one has to proceed with caution when considering generalizing the findings to northern California for health care providers due how specific regions or localities interpret screening standards and the population that was serviced. In addition, it is challenging to determine whether the definitions, screening practices, and locations accurately reflect those settings throughout California. Further, because health care providers may complete and record the screened data differently, the extent of under-reporting or over-reporting of behaviors could not be determined.

Delimitations

The major delimitation of this study was the enrollment criteria for participants. The study was delimited by the use of one health care organization in one specific area in California. The data collected represented only health care providers in Sacramento, California at one specific children's hospital and therefore did not represent all health care providers. The data represented only teens aged 13 to 17 years in one area and, therefore did not represent all teens. The sample represented health care providers at the University of California, Davis Medical Center and Children's Hospital Sacramento.

Significance of Study

The significance of the study was its analysis of the relationship between non-obese teens and the screening method used for detecting adolescent HBP during the primary care visit or at another venue. In addition, if the screening detection method used was the same for obese and non-obese teens. According to the U.S. Preventative Task Force (2013), although HTN is common in adults, approximately 1 to 5 of every 100 children and teens also have HTN. The strongest risk factor for HTN in children and teens is being overweight. Finding and treating HTN early in young people could lower their risk for complications during adulthood. To help clinicians decide whether to screen, it was necessary to know whether early detection actually improves health outcomes. It was also important to consider the potential harms of starting blood pressure medications and other treatments in young people. Current research reiterates insufficient evidence supports screening for HTN in children and teens due to lack of knowledge about balancing the known benefits and harms of screening. In addition, the significance of this research study will help to identify risk factors in the screening process that can developed into a screening protocol to provide consistent results for determining adolescent HBP and possibly adapted to include screening for minor children.

Adolescent HBP is a disease that can be eliminated through education, diet, exercise, and health education. Teens are developing HBP at alarming rates. This may be due to conditions beyond their control, including low birth weight at delivery. High rather than low birth weight may be related to a higher blood pressure in late pubertal black children (Li et al., 2006).

Screening is important in determining HBP especially in teen who are the primary stakeholders. A simple formula to screen for HBP in children and teens was developed. Age, gender, and body size are the main determinants of blood pressure in children, but now other screening factors are used to screen for HBP; these include weight, height and family history (Badeli et al., 2010). Lastly, the significance of this study will be to implement mechanisms to establish screening practices to support professional practice that will lead to positive social change via proactively managing this high-risk population.

Summary

This research study was organized into five chapters. Chapter 1 was an introduction to the research, providing a background to the problem, the problem statement, and the research questions. In addition, Chapter 1 included argument that addressed the overall need for a study of this type. Chapter 2 presents a review of related literature that revolve around studies conducted to examine behavior risk practices in adolescence and their relationship to the prevalence of HBP and obesity in the context of generalized perceived risk. Chapter 3 presents the methodology that used to conduct this research study. The methodology includes the research design, target population, sampling procedure, instruments used, data collection procedure, and analysis of the data. Chapter 4 provides the findings derived from the analyses computed, and Chapter 5 consists of the summary, conclusion, and recommendations.

Chapter 2: Literature Review

Overview

In the literature review, I provided a summary of previous research conducted on risk factors for the development of obesity and HBP. This study will examine the screening practices of non-obese African-American teens for undetected HTN. I designed the study to also review the health care provider's perception of screening practices for asymptomatic teens. There is evidence that a broad screening protocol should be used to assess blood pressure readings in both symptomatic and asymptomatic teens. Although many previous studies examined screening obese teens, I could identify no studies that explored screening non obese African American teens from the health care providers' perspective. Based on the conceptual framework, the HBM of health-behavior change in this phenomenological qualitative study, I sought to explore the attitudes and screening practices among health care providers who participate in the screening of teens who are asymptomatic, African American, and diagnosed with HBP or HTN.

Throughout this study, I identified standard screening practices for asymptomatic teens. The AHA is a part of a recent campaign to educate families on HTN or HBP in teens, as well as children and babies (AHA, 2014). The AHA (2014) recommends that every child have a yearly blood pressure screening. The Centers for Disease Control and Prevention (CDC) (2016) has recommended that early diagnosis can help to reduce the health consequences of HTN not only in teens, but among African Americans generally.

Normal HBP is calculated and determined by three primary factors: (a) age, (b) height, and (c) gender (AHA, 2014). Certain medications as well as other diseases can contribute to a higher blood pressure reading. If a teen has essential or primary HTN, in most cases, physicians or health care professionals cannot determine the direct cause of HBP in the child. This type of HBP is known as primary or "essential" HTN. Even though the exact cause is not diagnosed, health care professionals realize a variety of factors can contribute to the disease, including family history, excess weight, or obesity and race, particularly among African Americans who are at increased for primary HTN. Secondary HTN is the result of having another disease, mainly diabetes or kidney disease or another underlying condition (AHA, 2014). The CDC (2016), which promotes adolescent and school health, identifies HTN and also has a Division for Heart Disease and Stroke Prevention. This division recognizes the importance of controlling HBP in all age and ethnic groups, but particularly in the African-American community (CDC, 2016). Results of other studies have helped the teens and health care professionals to understand the importance once diagnosed with HTN. In Chapter 2, I review current literature that relates to HTN, adolescent and school health, physical activity, childhood obesity, and pediatric and teen screening practices for HTN for both symptomatic and asymptomatic populations.

Literature Search Strategies

I used the following research databases to conduct this literature review: CINAHL & MEDLINE Simultaneous Search, Pub Med, and Health Sciences: A SAGE Full-Text Collection and Google Scholar with full text. Search terms included *HTN*, *HBP*, *adolescence health*, *school health*, *children illnesses*, *teen*, *African-American*, *heart disease*, *CVD*, *epidemiology*, *pediatric*, *primary HTN*, *secondary HTN*, *essential HTN*, *obesity*, *outcomes*, *screening*, *age*, *race*, *gender*, *weight*, *weight*, *height* and *clinical setting*. I searched all databases for publications published to the present date. To avoid omitting important historical publications, I did not limit the search by year of publication initially. Search results included only publications in English. I located additional articles using scholar.google.com and reference resources at Walden University Library, the Fairfield/Vacaville California Public Library, and The University of California, Davis Health Sciences Library.

Most research studies used in this literature search were published within the last 5 years; however, I incorporated some research studies beyond 5 years because there were few articles that supported the topic of this study. I identified a more than 315 articles for review and included articles based on their relevance to the present study. I then grouped articles into the following categories by topic: HTN/HBP, adolescence, obesity, screening practices, epidemiology, demographics, health, NHANES, and methodology. The majority of the cited references were published in scientific journals. Most of the studies took place in North America, some took place in Europe, and a few took place in the rest of the world.

Epidemiology of HTN

HTN has been estimated to affect 20 to 25% of the adult population and represents an important risk factor for CVD such as coronary heart disease, stroke and peripheral artery occlusive disease. In addition, HTN supports the development and progression of chronic kidney insufficiency. The interaction of multiple genetic and environmental factors is believed to influence the level of blood pressure. Epidemiological data in the 1960s and 1970s demonstrated a correlation between and infant mortality in the same population. In the late 1980s, Barker et al. (1980) described a strong correlation between low birth weight and increased risk for the development of cardiovascular complications. Factors influencing the intrauterine growth and development can lead to adult CVDs, known as the concept of "fetal programming." Beside the effect of fetal programming, multiple (preventable and non-preventable) factors determine the blood pressure level in childhood, which will define adult blood pressure level through the blood pressure tracking from childhood to adulthood (Kelishadi, Haghdoost, Jamshidi, Aliramezany, & Moosazadeh, 2015). Hence, the prevention of CVD in adulthood begins in childhood through identification of preventable risk factors as for example obesity and passive smoking and recognition of risk groups such as those who were small for their gestational age or those who were born preterm (Redwine & Daniels, 2012; Falkner et al., 2010; Bucher et al., 2012).

HTN is a global problem, affecting both developed and developing nations. In addition to being a major cause of morbidity and mortality, HTN places a heavy burden on health care systems, families, and society. Despite evidence of an increasing prevalence of HTN among youth, the consequences of early onset are poorly established and often overlooked. Childhood HTN was often asymptomatic and easily missed, even by health professionals. Target organ damage was detectable in children and teens, however, and HTN continues into adulthood. Additional strategies to improve cardiovascular health among children and teens are needed, including methods to achieve healthy lifestyles at home and in school, improved systems for diagnosis, and research on mechanisms and timing of interventions. The burden of HTN in the young will continue to grow unless it is given the attention it deserves by policy makers, health care providers, schools, parents, and society. This report aims to increase awareness of the problem of HTN in childhood. Recent reports on prevalence and target organ injury are discussed and health policy initiatives to improve blood pressure control are proposed.

In 2004, the National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents recommended a new designation of pre-HTN for children with mildly elevated BP. This description was intended to help identify children most at risk for the development of persistent HTN for those for whom targeted prevention programs would be most beneficial, and the description was based largely on expert opinions and epidemiologic normal values. This review summarizes the knowledge that has been gained regarding the epidemiology and risk associated with pre-HTN in teens since its inception and highlights future challenges in understanding and preventing the development of hypertensive disease in this population.

Chronic diseases such as HTN can lead to CVD in children and in adults. Chronic degenerative diseases, especially heart disease and cancer, are the leading causes of death in the United States (Schneider, 2011). Diseases that develop through time can be complicated, particularly a disease that can kill without a moment's notice. HTN is that type of disease.

The U.S. National Library of Medicine (NLM, 2014) and the National Institutes of Health (NIH, 2014) define *high blood pressure* or *HTN* as a measurement of the force against the walls of arteries as the heart pumps blood through the body. *HTN* is another term used to describe HBP. Blood pressure readings are given as two numbers. The top number is called the systolic blood pressure. The bottom number is called the diastolic blood pressure. For example, the format is 120 over 80 (written as 120/80 mm Hg). One or both of these numbers can be too high. Normal blood pressure is when blood pressure is lower than 120/80 mm Hg most of the time. HTN is when blood pressure is 140/90 mm Hg or above most of the time. Pre-HTN refers to blood pressure numbers that are 120/80 or higher, but below 140/90.

The abundance of general academic studies on the study of HTN resulted from many Americans in the United States having an increased prevalence of HTN in some specific areas of the United States or from those dying in record numbers from this disease. To better understand this prevalence, understanding the disease itself is needed. Many studies dating back to the 1940s examined the effects of HTN on specific communities and ethnic groups. CVD studies yielded results that were directly related to HTN, particularly studies that analyzed racial differences and ethnic backgrounds.

The Framingham Heart Study (FHS) was conducted in 1948, as well as the Western Collective Study, which studied the epidemiology of HTN. In the last 50 years, heart or cardiac diseases have garnered interest from the medical community. Several cohorts were studied including the Framingham cohort as well as the Western Electric cohort (Paul & Ostfield, 1965; Boston University, 1948). The Original Cohort of the Framingham Heart Study consisted of 5,209 respondents of a random sample of two thirds of the adult population of Framingham, Massachusetts, 30 to 62 years of age by household, in 1948. This cohort was the first of its type to study heart disease. The following tables depict the data that were obtained from this cohort study.

Table 1

Age-Sex Distribution of Entry (1948) Original Cohort- Framingham Heart Study

Sex	Age of Participant (y)			
	29-39	40-49	50-62	Total
Men	835	779	722	2,336
Women	1,042	962	869	2,873
Total	1,877	1,741	1,591	5,209

Note. From "Framingham Heart: A Project of the National Heart, Lung and Blood Institute and Boston University," by NHLBI and Boston University School of Medicine, 2016, *New England Journal of Medicine*, *239 (17)*, p. 639. Reprinted with permission

The Western Collaborative Group Study (WCGS) is a prospective epidemiological study of 3,154 initially healthy men, aged 39 to 59 years, at intake in 1960 to 1961, who were employed in ten participating companies in California. Clinical coronary heart disease (CHD) occurred in 257 men during a follow-up period of 8 ½ years (Brand, Rosenman, Sholtz, & Friedman, 1976).

These two cohorts studied heart disease for more than 60 years to determine how this disease progresses. To determine if heart disease was generational and hereditary, two additional cohorts were studied from the original FHS study, The Offspring Study was initiated in 1971 when the need for establishing a prospective epidemiologic study of young adults was recognized. A sample of 5,124 men and women, consisting of the offspring of the Original Cohort and their spouses was recruited and the Third Generation Cohort (Gen III). The following table depicts the data obtained from this cohort study.

Table 2

Age Sex Distribution at Entry (1971) Offspring Cohort (Gen II) Framingham Heart Study

Sex	Age of Participant (y)							
	<10	10-19	20-29	30-39	40-49	50-59	60-70	Total
Men	0	126	543	789	694	293	38	2,483
Women	6	113	692	835	740	242	13	2,641
Total	6	239	1,235	1,624	1,434	535	51	5,124

Note. From "Framingham Heart: A Project of the National Heart, Lung and Blood Institute and Boston University," by NHLBI and Boston University School of Medicine, 2016, *New England Journal of Medicine*, *239 (17)*, p. 639. Reprinted with permission

A recent major component of the Framingham Heart Study protocol has been the enrollment and examination of a third generation of participants which will provide better resources for phenotypic and genotypic information. During Offspring Exam Cycles 6 and 7, the Offspring participants were asked to update information about their children. To assess interest in participation prior to the start of clinic exams, 5,500 letters and response cards were sent in November 2001 to prospective third- generation participants who had at least one parent in the Offspring Study and would be at least 20 years old by the close of the first exam cycle. Later an additional 1,241 invitation letters were sent. A prioritization of the recruitment list was prepared. Considerations were given to family size, completeness of data, stored DNA, and responsiveness of the Gen III members of the families. The following table depicts the data obtained from this cohort cohort study.

Table 3

Age Sex Distribution at Entry (Through 2005) Third Generation Cohort

Sex	Age of Participant (y)							
	19	20-29	30-39	40-49	50-59	60-69	70-79	Total
Men	4	220	656	737	276	19	1	1,913
Women	3	262	759	848	293	16	1	2,182
Total	7	482	1,415	1,585	569	35	2	4,095

Note. From "Framingham Heart: A Project of the National Heart, Lung and Blood Institute and Boston University," by NHLBI and Boston University School of Medicine, 2016, *New England Journal of Medicine*, *239 (17)*, p. 639. Reprinted with permission

Two other cohorts were established from the original cohort; New Offspring Cohort and New Offspring Spouse Cohort. If the spouse of offspring was never enrolled in the Framingham Heart Study and if at least two of his/her biological children participated in Exam 1 of Gen III, that spouse was invited to participate in the New Offspring Spouse Exam 1. The addition of their data and cell lines may improve the statistical power for studying families at FHS. Most of the Gen III participants had both parents already enrolled in the Framingham Offspring Study and the Omni cohorts. The following table depicts the data generated from the offspring spouse cohort study.

Table 4

Age Sex Distribution at Entry (2005) New Offspring Spouse Cohort

Sex	Age of Participant (y)					
	40-49	50-59	60-69	70-79	80-89	Total

Men	1	13	14	16	3	47
Women	1	19	17	17	2	56
Total	2	32	31	33	5	103

Note. From "Framingham Heart: A Project of the National Heart, Lung and Blood Institute and Boston University," by NHLBI and Boston University School of Medicine, 2016, *New England Journal of Medicine*, *239 (17)*, p. 639. Reprinted with permission

Through the years, the community of Framingham has changed. In the early 1990s, the need to establish a new group of participants reflecting the increasing diversity of the community was recognized. In 1994, the Omni Cohort 1 of the Framingham Heart Study was initiated. The original Omni cohort consisted of 507 men and women of African-American, Hispanic, Asian, Indian, Pacific Islander and Native American origins, who at the time of enrollment were residents of Framingham and the surrounding towns. Omni Cohort 1 continues to be examined and followed. The following table depicts the data obtained from this cohort study.

Table 5

Age Sex Distribution at Entry (Race-Based)-Omni Cohort

Sex	Age of Participant (y)					
	20-39	40-49	50-59	60-69	70-79	Total
Men	7	96	67	36	6	212
Women	13	130	92	42	17	294
Total	20	226	159	78	23	506

Note. From "Framingham Heart: A Project of the National Heart, Lung and Blood Institute and Boston University," by NHLBI and Boston University School of Medicine, 2016, *New England Journal of Medicine*, *239 (17)*, p. 639. Reprinted with permission

These cohorts represent the initial examination of a large group of individuals that had a family connection to heart disease. These cohorts are still being followed today to become of the largest familial studies on CVD and heredity.

Cardiovascular Disease

The ethnology of CVD in African-Americans has a long and varied history. In the early 1930s, studies were being done to determine the differences in death rates due to heart disease and complications between Caucasians, African-Americans and Indians (Schwabe & Schulze, 1932, Peery & Langsam, 1939; Burch & Voohries, 1939, Blaceh & Andler, 1950; McVay & Keil, 1955; Lenard & Glock, 1957; Thomas, Blache, & Lee, 1957; Stamler, Kjelsberg, Hall, & Scorch, 1960). The AHA defines *cardiovascular disease* as diseases of the heart or blood vessels (AHA, 2014). Another definition from the clinicians at the Mayo Clinic defined *CVD* or *heart disease* as a range of conditions that affect your heart. Diseases under the heart disease umbrella include blood vessel diseases, such as coronary artery disease; heart rhythm problems (arrhythmias); and heart defects at birth (congenital heart defects), to name a few (Mayo Clinic, 2014).

Although the term “*heart disease*” is often used interchangeably with the term ”*cardiovascular disease*” it is noted that CVD generally refers to conditions that involve narrowed or blocked blood vessels that can lead to a heart attack, chest pain (angina) or stroke. Other heart conditions, such as those that affect heart muscle, valves or rhythm, also are considered forms of heart disease.

For teens, cardiovascular disease develops during the course of their childhood and usually occurs as an adult. However, warning signs are present in both children and teens with conditions such as kidney disease, diabetes or HBP. These diseases are usually precursors to cardiovascular disease as adults (Lee, Lee, Park, Kim, Oh, & Shin, 2013). In addition, obesity or being overweight as teens leads to adult CVD (Messiah, Arheart, Natale, Hlaing, Lipshultz, & Miller, 2012) especially when coupled with other risk factors such as diabetes, chronic kidney disease or a family history of heart disease. Teens with these typical risk factors are most times automatically screened for HTN or CVD more so than a teen that are asymptomatic (Akgun et al., 2010) or a teenager that does not exhibit the typical identifiers for HTN.

Family history played an important role in whether HTN was diagnosed children and teens. Common or typical risk factors included obesity, race, ethnicity, poor diet, a family history of smoking or alcohol abuse, as well as CVD (Riley & Bluhm, 2012).

Around the world, CVD in youth is on the rise (World Health Organization (WHO), 2014). The risks for CVD start in youth or adolescence worldwide, 18 million children under five years old are overweight, and 14% of 13 to 15-year-old students around the world currently smoke cigarettes (WHO, 2014). These are contributing factors to the development of HTN in the adolescent population.

HTN in the African American Community

HTN in the African American community has been consistently described as a disease that disproportionately affected this community and ethnic group (CDC, 2014). It has been estimated that over 67 million people or one in three Americans have HBP and that HBP contributes to approximately 1,000

Americans deaths each day (CDC, 2014). The CDC (2014) reports that HBP contributes to 69% of first heart attacks, 77% of first strokes and 74% of those Americans with chronic CVD (CDC, 2014). The direct medical costs of this disease are estimated at $47.5 billion a year (CDC, 2014).

When looking at the African-American community and HTN, articles were written in the 1940s. In 1948 a study was done on 300 inmates in a prison or Farm Colony in New York City that included 3 Negroes to determine the electrocardiographic changes associated with old age. Because the Negro population studied was so small, no racial or ethnic significances were obtained (Fox, Weaver & Francis, 1948).

In 1962 a CVD study was done in Charleston, South Carolina that analyzed and studied this disease by race (Nichaman, Boyle, Lesesne, & Sauer, 1962). The results of this study included cerebrovascular and hypertensive diseases combined, the Negro male rate was more than 5 times the white male rate, but for females the Negro rate was 10 times the white rate (Nichaman et al., 1962). This data was obtained from various sources to include death certificates as well as vital statistics. For arteriosclerotic or coronary heart disease, there was conflicting evidence. In an extensive review of the literature, researchers Phillips and Burch (Phillips & Burch, 1959) with support from other studies (Thomas, Blache, & Lee, 1957; McVay & Keil, 1955; Peery & Langsam, 1939; Lennard & Glock, 1957; Burch & Voohries, 1939) concluded that arteriosclerotic heart disease is invariably more prevalent in the white race than in Negroes. However, most of the studies which Phillips and Burch (Phillips & Burch, 1959) reviewed were based on autopsy data or data which had the bias of being studies in highly selected population groups, frequently without knowledge of the age distribution of the population at risk.

Vital statistics data, on the other hand, consistently show arteriosclerotic heart disease death rates for females within the age span 35 through 64 to be markedly higher for nonwhites than for whites. For males ages 35 through 44 the rate is lust as high for nonwhites as for whites, while for ages 45 through 64 the ratio is roughly 4:3, with whites usually having the higher rates. These generalizations apply not only for the United States as a whole but also for most individual states. Extensive studies by Stamler and co-workers (Stamler, Berkson, Lindberg, Miller & Hall, 1961) present similar Negro-white comparisons of mortality experience. It was also noted that a particular type of Negro was studied so that the study could be relative to other African countries. The Charleston Negro is distinct from and closer to West African Negroes than the general American Negro. The racial makeup of an individual plays a role in how HTN was defined and identified.

HTN has also been a major concern in the African-American community as early as the 1930s. During this time the southern states such as North and South Carolina were conducting studies to determine the prevalence of CVD and HTN in the African American or Negro community.

Historically, dating back to the 1960s, there have been studies to understand the differences in blood pressure and hypertensive disease among Negroes and Whites (McDonough, Garrison, Hames, 1964). These same authors (McDonough, Garrison, Hames, 1964) have speculated that African Americans have either left ventricular hypertrophy (LVH) or cardiac enlargement (CE). Left ventricular hypertrophy is the major pumping chamber of the heart is the left ventricle. This heart chamber pumps oxygenated blood into the aorta, the large blood vessel that delivers blood to the body's tissues. If the left ventricle has to work too hard, its muscle hypertrophies (enlarges) and becomes thick. This is called left ventricular hypertrophy (LVH). Cardiac enlargement is where the heart is enlarged either due to hypertrophy or dilation. Dilation involves an increase in the size of the inside cavity of a chamber of the heart. Hypertrophy usually occurs in only one chamber while dilation may occur in one, two, three, or all of the chambers, based on its cause. A discussion ensued as to whether this hypertrophy or dilation can be determined in childhood. According to McDonough, Garrison and Hames (1964) there is a single hypertensive gene that could tentatively explain the racial differences in blood pressure. The studies were conducted in 1960s to illustrate the different blood pressures between African Americans and Caucasians.

Teen HTN in the United States

According to the United States Preventative Task Force (2013) although HTN is common in adults, approximately 1 to 5 out of every 100 children also have HTN. HTN in teenagers in the United States continues to increase (Riley & Bluhm, 2012). These researchers maintain that HTN in children and teens are a growing health problem. In 2012, there was an increased prevalence of 3.4% for pre-HTN and a 3.6% prevalence of HTN in children between the ages of 3 -18 years old (Riley & Bluhm, 2012). Early detection in this population can lead to a reduction of adult CVD as well as the early identification and monitoring of HTN so that changes can be made to lifestyle habits or dietary issues.

The population most affected by HBP includes African-Americans and Hispanics both as children and as adults. There are reasons that are still a mystery to the medical community as to why African-Americans have rates of HTN and associated conditions that are disproportionately higher than other major ethnic groups in the United States. Adolescent HTN leads to adult HTN which is the leading cause of premature death in the world (Riley & Bluhm, 2012). Even with this high prevalence rate of HTN, this population - children and teens are overlooked by physicians. In a separate study it was noted that only 26% of the children in that study had documented HBP in their electronic medical record (Thompson, Dana, Bougatsos, Blazin, & Norris, 2013). According to the World Health Organization (WHO) Although CVDs typically occur in middle age or later, risk factors are determined to a great extent by behaviors learned in childhood and continued into adulthood, such as dietary habits and smoking. Throughout the world, these risks are starting to appear earlier (WHO, 2014). Physical activity decreases markedly in adolescence, particularly in girls. Obesity has increased substantially, not only in Europe and North America, but also in traditionally slender populations such as the Chinese and Japanese. Markers of CVD can be seen in young children. Post-mortems of children who died in accidents have found fatty streaks and fibrous plaques in the coronary arteries. These early lesions of atherosclerosis were most frequently found in children whose risk factors included smoking, elevated plasma lipids, HBP and obesity (WHO, 2014).

An organization that monitors the health of both children and teens (Kidshealth.org, 2014) asserts that for children 18 years old and young, HBP is considered a blood pressure greater than the 95th percentile for their age, height, and gender. Measurements between 90% to 95% of the expected range are considered borderline or pre-HTN. Children and teens with blood pressure readings that are greater than 90% of the expected range are three times more likely than those with average readings to develop HBP as adults (Hypertension, 2013).

Teens can be diagnosed with either primary or secondary HTN. Primary HTN is between the 95th and 99th percentile and secondary HTN is over the 99th percentile (Riley & Bluhm, 2012; Rosner, Cook, Portman, Daniels, & Falkner, 2009). Because of this, these researchers also recommend that beginning at three years of age; children should have their blood pressure measured at every office visit. For many teens, HTN was diagnosed after the onset of other illnesses like diabetes or kidney disease.

A Healthy People 2020 objective is to reduce the prevalence of HTN among children and teens by 10%. In 2004, the National High Blood Pressure Education Program Working Group on Children and Adolescents recommended that health care providers measure blood pressure in children aged >3 years who are seen in a medical setting (CDC, 2014). The Bright Futures guidelines developed by the American Academy of Pediatrics (AAP) at the request of the Health Resources and Services Administration (HRSA) recommends that children and adolescents aged 3–17 years receive blood pressure screening during their annual preventive care visit (Healthy People.gov, 2014). However, in 2006, only 85% of children and adolescents had a preventive health care visit. The National Quality Forum (NQF) has endorsed blood pressure screening as a performance measure, with documentation in the medical record as to whether the result was abnormal for children during the year they reach age 13 years and again during the year they reach age 18 years (HealthyPeople.org, 2014).

In the United States, the prevalence of elevated blood pressure (BP) in children appears to be increasing. This was illustrated in a study that analyzed population-based data from the National Health and Nutrition Examination Survey (NHANES) III from 1988 to 1994 and from the continuous NHANES 1999 to 2008. The prevalence of elevated BP (defined as either a systolic or diastolic BP ≥90th percentile or ≥120/80) increased from NHANES III to NHANES 1999 to 2008 in both boys (15.8 to 19.2 percent) and girls (8.2 to 12.6 percent). After adjusting for confounding variables, the increase in elevated BP was independently associated with increases in body mass index, waist circumference, and sodium intake.

In contrast, an earlier study using data from the Bogalusa Heart Study showed that, from 1974 to 1993, mean systolic blood pressure (SBP) levels remained the same and mean diastolic blood pressure (DBP) decreased by 2 mmHg, while the rates of obesity increased from 6 to 17 percent (Mattoo, Stapleton, & Kim, 2012; Falkner, Lurbe, & Schaefer, 2010).

In a study of a large cohort of children of diverse race and ethnicity cared for in community-based practices from 2007 to 2009, the reported prevalence of HTN based upon confirmed persistent BP ≥95th percentile was 0.3 percent. In this group of children, risk factors for HTN included increasing body mass index (BMI) and age. Children who were black or Asian also were more likely to be at risk for HTN compared with other ethnic groups (Mattoo et al., 2012).

HBP was a clearly established, but modifiable, risk factor for early disability and death. While few would dispute the importance of taking effective steps to identify and manage this condition in middle-aged and elderly people, relatively little attention has been paid to the problem of high BP in children. It is now established, however, that high BP was detectable in children and adolescents, was surprisingly common, and was increasing in prevalence (Falkner et al., 2010).

Teen HTN in California

In California, approximately 1 in 4 American adults has HTN; although the exact prevalence of HTN in children is unknown, it is assumed to be far lower in children than in adults. An estimated 1–2% of children in the U.S. have HTN; the majority of these are adolescents (Lo, Sinaiko, & Chandra, 2013; KPMC, 2014). California has one of the largest managed care organizations in the United States. Kaiser Permanente Southern California (KPSC) is the largest health care provider in Southern California. In 2012, KPSC provided health care services to more than 3.6 million members, approximately 22% of whom were 17 years or younger (Koebnick et al., 2013). KPSC has studied pre-HTN and HTN in teens. HTN is one of the leading causes of global disease burden

(Ezzati et al., 2002; Danaei et al., 2009; Rodgers et al., 2004; Kearney et al., 2005). Early diagnosis, evaluation, and treatment of HTN are important to alleviate the health risks associated with HTN (Daniels et al., 1999; Hanevold et al., 2004; Sorof, Lai, Turner, & Poffenbarger, 2002). End-organ damage in the form of cardiac structural changes, a consequence of HTN, can be present in adolescent and early adult life (Hanevold, et al., 2004; Sorof et al., 2002).

In contrast to HTN secondary to causes such as renal disease, primary HTN is usually asymptomatic and often remains undiagnosed. To assess future economic and health care demands resulting from the significant disease burden associated with HTN, reliable estimates for the prevalence of pediatric HTN are vital. Recent studies suggest that the prevalence of HTN in youth and young adults is increasing. According to previous studies, the prevalence of HTN in youth, identified by ≥3 blood pressures (BPs) ≥95th percentile, was between 0.1% and 5%. However, previous studies in youth are inconclusive because of small sample size, limited follow-up to confirm HTN, and differences in clinical vs. school-based settings (Koebnick et al., 2013).

Researchers in California found that young people who are overweight are twice as likely as their normal-weight peers to have HTN; moderately obese youths have four times higher risk; and extremely obese children and adolescents are 10 times more likely to have HTN. The study also found 10 percent of youths who are extremely obese have HTN and nearly half have occasional blood pressure measurements in the hypertensive range. Earlier studies showed that between 1 percent to 5 percent of youth has HTN (KPMC, 2014)

Kaiser Permanente Northern California (KPNC) in conjunction with Kaiser Northern Colorado (KPCO) conducted a study on teen HTN (Lo et. al., 2013). KPNC was considered a community-based setting in Oakland, and colleagues examined the prevalence of pre-HTN and HTN among 199,513 children (aged 3 to 7 years) with considerable ethnic diversity, from three large integrated health care delivery systems (Lo et al., 2013). In the past 2 decades there has been increased recognition of the importance of blood pressure (BP) measurement in the pediatric population, particularly in relation to the rising prevalence of childhood obesity. However, the importance of BP goes beyond its relation to obesity, because longitudinal studies reveal a relation between childhood BP and future cardiovascular risk factors in young adults, independent of BMI. Data from pediatric BP screening programs and the NHANES support early detection and management of HTN in pediatric practice, particularly given its association with excess weight and other cardiovascular risk factors and the increasing awareness of childhood origins of adult disease (Lo et. al., 2013).

The Kaiser Permanente studies in both Northern and Southern California recognize the importance of understanding adolescent HTN to minimize the risk for CVD. Both studies reiterate that there are many risk factors for HTN, including family history, obesity, sedentary lifestyle, diabetes mellitus, metabolic syndrome, smoking, alcohol use (even in small amounts), excess dietary sodium, and underlying heart or renal disease (Lo et al., 2013). Both studies also highlight the importance of future research in adolescent HBP.

Clinical Diagnosis and Measurement

HTN in children is usually asymptomatic. Severe HTN presentation may include headache, fatigue, blurred vision, epistaxis, Bell's palsy, abdominal pain, or chest pain, and children may exhibit subtle symptoms of irritability, school performance changes, or personality changes.

At the initial clinical visit in the KPNC study, the researchers found that 81.9 percent of children were normotensive, 12.7 percent had pre-HTN, and 5.4 percent had blood pressure within the HTN range. HTN was confirmed in 3.8 percent of the 10,848 children with an index hypertensive blood pressure level who had a follow-up blood pressure measurement (estimated prevalence, 0.3 percent). Pre-HTN and confirmed HTN correlated significantly with increasing age and body mass index. The highest prevalence of HTN was seen for blacks and Asians (Lo et. al., 2013).

The prevalence of pre-HTN was similarly related to both age and BMI, although the significant reduction in prevalence of confirmed HTN. In a clinic setting, one of the first steps in determining if a teen has HTN was determining if the blood pressure was truly elevated.

Measurement of blood pressure in children requires adaptation to the age and size of the child. Interpretation must be related to normative values specific for age, sex, and height. Evaluation was primarily aimed at identifying secondary causes of HTN, associated comorbidities, additional risk factors, and evidence of target-organ damage. Ambulatory blood pressure monitoring was emerging as a useful tool for evaluation of some patients, particularly for those with suspected 'white coat' HTN. Management of pre-HTN and HTN was directed at the underlying cause, exacerbating factors, and the magnitude of the blood pressure abnormality. Healthy behavioral changes are a primary management tool for treating HTN and, more particularly, pre-HTN and for addressing other cardiovascular risk factors, such as obesity. Pharmacological management was reserved for patients with HTN who do not respond to behavioral changes, have additional cardiovascular risk factors or diabetes, are symptomatic, or have developed target-organ damage (McCrindle, 2010).

Evidence of target organ damage, such as left ventricular hypertrophy (LVH), and pathological vascular changes have been found even in young children and in children with newly diagnosed HBP. Even subtle neurological changes, which manifest as reduced cognitive function, have also been detected among children with HBP (Falkner et al., 2010).

HBP may be under diagnosed in children and adolescents for several reasons, including an overall lack of routine testing and technical issues. Compared with adults, there are more technical issues in accurate BP measurement such as the appropriate BP cuff size and difficulty with auscultation in small children. Cuffs of different sizes are needed for children of different ages and for the obese patient. Use of an inappropriately sized cuff may give false readings. Auscultation was the preferred method for BP measurement, but this can be difficult, particularly in small children. Automated oscillometric instruments are not recommended in routine care because they calculate BP values from proprietary algorithms that differ between manufacturers and devices; thus, results can vary widely. However, these devices are commonly used in large pediatric clinics due to convenience (Falkner et al., 2010).

A recent update by the AHA (2014) reported that the rise in prevalence of HTN in the young was especially worrisome, because autopsy studies such as the Bogalusa Heart Study and the Pathobiological Determinates of Atherosclerosis in Youth study have demonstrated increased atherosclerosis at higher BP levels in youths (AHA, 2014). Therefore, accurate assessment of BP and treatment of HTN in children and adolescents are essential for the prevention of future heart disease. Emerging data suggest that Ambulatory Blood Pressure Monitoring (ABPM) may be superior to clinic BP in predicting cardiovascular morbidity and mortality in adults (AHA, 2014). For this reason, ABPM was being increasingly used in the evaluation for HTN and risk of end-organ damage in youths. ABPM may be superior to casual (office) BP measurement in its ability to distinguish patients at the highest risk for target-organ damage (Flynn et al., 2014).

African Americans Teens and HTN

Every year, Americans suffer more than 1.5 million heart attacks and strokes. Nearly 44% of African American men and 48% of African American women have some form of CVD that includes heart disease and stroke (CDC, 2014). Race was a known risk factor for HTN and CVD in adults and influences blood pressure (BP) in children (Brady, Redwine, & Flynn, 2010).

Globally, the health disparity of HTN is disproportionately greater within the African American population and develops at an earlier age. Elevated and continuous interaction of biologic measures during adolescence may be precursors and indicators of risk for blood pressure changes and the subsequent development of adult essential HTN (Covelli, Wood, Yarandi, 2012). African Americans often experience early onset of HTN that can result in generations of adults managing HBP concurrently, including children and teens (Warren-Findlow, Seymour, & Shenk, 2011). Children and teens are more prone to develop HTN in the African-American family, particularly if there was a family history of HTN.

Several studies suggest that there was a racial component to adolescent HBP (Bell et al., 2013; Faulkner et al., 2012). A Pediatric Task Force data used to generate the pediatric normative BP values on several occasions to assess whether ethnicity was a factor influencing BP. Their initial evaluation of over 47,000 children aged 5-17 included 30,00 white and 17,000 black subjects; at the time of this study, race or ethnicity was not warranted, but rather weight and height (Bell et. al., 2013). The United Kingdom however has been instrumental in analyzing the ethnic differences in HTN in adolescents. Using the Determinants of Adolescent Social Well-Being and Health (DASH) study, ethnic differences were discovered in BP in both boys and girls (Bell et al., 2013; Acosta et al., 2012).

The population most affected by HBP includes African American and Hispanic. For reasons that remain speculative, Black Americans have rates of HTN and associated conditions that are disproportionately higher than other major ethnic groups in the United States (Rodriguez et al., 2010).

Long held issues and stressors can also lead to the development of HTN. African-American youth have long held that racism is alive and well in the United States based on their skin color alone. This can depend on the community in which they live or school which they attend. If the prevailing attitudes in these environments are those of high unemployment, high crime or modest income levels, teens can be forced or threatened into a life of crime. Because of this type of hopeless attitude, this can manifest itself into anger, anxiety or stress, whether perceived or actual. As a perceptual reality for many Blacks perceived racism was an environmental factor that was associated with physiological functioning. Consistent with research explicating the relationship of perceived stress to psychological and physiological functioning, chronic perceptions of racism have been postulated to be associated with such cardiovascular processes as hyper-reactivity (Clark, Gochett, 2006).

The public health policies that would have implications include diagnosing and treating teenagers aggressively in their teen age years to avoid chronic cardiovascular conditions as they age. Early detection and prevention was the key. The National High Blood Pressure Education Working Group on HBP in Children and Youth makes recommendations that appear in the Pediatrics

Journal are developing policies to mandate screening and protocols to determine and treat HBP in adolescent. One such recommendation was for clinical outcomes; this includes specific evaluation tools and physician guidelines (Hellekson, 2005).

The association between overweight and HTN in children has been reported in a variety of ethnic/racial groups, with most studies finding higher blood pressure and/or higher prevalence of HTN in overweight children (Rodriguez et al., 2010). For many studies, the age grouping for studies was ages 5-17 years; therefore many studies include both children and teens, especially when studying racial differences.

African American Teens and Obesity

Childhood obesity has increased dramatically in recent years in the US, with approximately one third of children and adolescents being overweight and approximately 17% being obese. The rates of overweight and obesity are even higher among ethnic minorities, including African Americans, in whom these rates approach 40% and 24%, respectively (Pierce et al., 2013).

Obesity in the United States was linked to socioeconomic status (SES) and geographic location. Over half of the African American or Black population lives in the southern states (Bell, 2012). Local differences in diet and lifestyle in these 13 southern states may explain some of the BP differences between Whites and Blacks. Kiefe found that both Blacks and Whites from Birmingham had a much higher incidence of HTN than those from Chicago or Oakland, California. McGrath looked at individual and neighborhood race and SES effects on ambulatory BP as well and it was determined that diastolic blood pressure readings were greater in Black versus White adolescents (Acosta et al., 2012).

HTN and obesity are both closely linked. Obesity was one of the major risk factors that can lead to the development of HBP; coupled with HTN it can lead to CVD (Dhuper Abdullah, Weichbrod, Mahdi, & Cohen, 2011). Primary HTN in childhood was felt to be quite rare. However, the worldwide childhood obesity epidemic has had a profound effect on the frequency of HTN and other obesity-related conditions with the result that primary HTN should now be viewed as one of the most common health conditions in the young (Flynn, 2013). There was a worldwide epidemic of childhood obesity, which shows no signs of abating. In the United States, where the problem of childhood obesity has received considerable attention, up to 18 % of children and adolescents are classified as *obese* which is defined as a body mass index (BMI) greater than the 95th percentile per their age and gender (Flynn, 2013).

Obesity is associated with a higher systolic blood pressure (SBP) and pulse pressure (PP) in African-American youths, increasing their risk for developing HTN (Pierce et al., 2013). Recently Falkner and colleagues have shown in a cohort of Black adolescents that both obesity and HTN are significantly associated with increased left ventricular mass (LVM). LVM can also be related to an enlarged heart; (Dhuper et al., 2011). Understanding the racial differences in DBP and systolic blood pressure (SBP) in teens can lead to a better comprehension of teens prone to target organ damage.

BMI and waist circumference can be a predictor of racial difference in blood pressure variables. Boys had steeper increases in BP with age compared to girls and Blacks had higher blood pressure variability than Whites (Brady et al., 2012). BMI and waist circumference were related both to blood pressure variability and to race (Samuels, Bell, & Flynn, 2013).

Although African American and Hispanic teens have higher incidence and prevalence of overweight and obesity compared with non-Hispanic white adolescents, it is unknown whether these ethnic differences exist in rural communities. Urban and rural differences have been shown with respect to overweight and obesity in children, adolescents, and adults but these studies do not account for ethnic/racial differences (Rodriguez, et al., 2010). This shapes how teens will be screened in metropolitan versus rural areas.

According to the AHA (2011) the estimated prevalence of overweight and obesity among children 2 to 19 years of age, 31.9% are overweight and obese (which represents 23,500,000 children), and 16.3% are obese (12,000,000 children). Mexican American boys and girls and African American girls are disproportionately affected. Over the past 3 decades, the prevalence of obesity in children 6 to 11 years of age has increased from 4% to more than 20% (Rodriguez et al., 2010)

Obesity and its associated comorbidities produce a tremendous burden on public health systems. Understanding the potential health concerns in rural disadvantaged communities is critical for developing solutions and improving public health in these areas. The current prevalence of overweight and obesity in adolescents uses direct (not self-reported) measurements in a rural, predominantly minority population and uses these data to compare with published values from urban populations (Rodriguez et al., 2010).

The prevalence of overweight and obesity among U.S. adolescents has been increasing for the past 2 decades, although recent national data suggest that the prevalence of overweight and obesity in adolescents may have plateaued. Nonetheless, most data on US children and adolescents have come from studies on large metropolitan areas or national surveys that do not distinguish between urban and rural communities (Mattoo et al., 2012). Although African American and Hispanic adolescents have higher incidence and prevalence of overweight and obesity compared with non-Hispanic whites adolescents, it was unknown whether these ethnic differences exist in rural communities. Urban and rural differences have been shown with respect to overweight and obesity in children, adolescents, and adults, but these studies do not account for ethnic/racial differences. Furthermore, prevalence data from adolescents are scarce and not well characterized with respect to ethnic/racial categorization (Rodriguez et al., 2010).

Nonobese Teens With HTN

A 2012 study analyzing data from the National Ambulatory Medical Care Survey and the National Hospital Ambulatory Medical Care Survey assessed blood pressure screening during pediatric ambulatory office visits. It found that screening was done during 67% of preventive care visits and 35% of ambulatory visits. Screening was more common in children who were overweight or obese;

84% of these preventive care visits included screening for HTN. It was also more likely to be done in older children (Chiolero, Bovet, & Paradis, 2013).

The prevalence of non-obese or normal weight teens with HTN was one of the attributes analyzed in the NHANES study. BP percentiles based on normal weight children derived from cubic spline and quantile regression methods to (a) provide for more flexible models to express BP as a function of age and height over the entire pediatric age range and (b) relax the assumption of normality in defining percentiles. A recent report about the NHANES study was updated in 2013 (Rosner et al., 2013) that analyzed salt intake for both obese and non-obese and determined that there was a significant increase in blood pressure in the obese participants.

Teens that are considered normal weight or underweight can experience HTN. The Bogalusa Heart Study examined all areas of HTN in children and teens; they concluded that characteristics other than obesity can contribute to HBP in late childhood (Burke, Freedman, Webber, & Berenson, 1986). Additionally, between 1971 and 1981 the Muscatine Coronary Risk Factor Project measured, in six biennial school surveys, 2,631 school children 9 to 18 years of age; these children were assessed for obesity and HTN (Clarke, & Lauer, 1993). This study showed that about 31% of children, whose body mass index was high, became adults with substantially lower levels, while a similar number of lean children become obese adults. Why some obese children become obese adults and others do not remains an unanswered question. The data presented herein indicate that obesity was often acquired during childhood and adolescence when preventive measures could be applied (Clarke, & Lauer, 1993).

In one study, it was concluded that that both race and obesity have important roles in the development of end-organ damage among children with primary HTN (Pruette, Fivush, Flynn, & Brady, 2013). Those teens that are considered non-obese can become hypertensive; those that are obese are given priority screening because of their co-morbid nature. Obesity was a common co-morbid condition among hypertensive children, particularly those with primary HTN, and can contribute to the organ damage (Pruette et al., 2013).

Screening Resources for Asymptomatic Teens for HTN

Blood pressure screening programs are the first step in identifying and explaining HTN to teens. This is particularly important when discussions about HTN include groups that have initial challenges to receiving adequate access to health care and that are perhaps, just unaware of their predisposition to acquiring this chronic disease (Mangat et al, 2015). Pediatric HTN is still being mishandled and misdiagnosed; therefore providing screening resources to teens are limited.

Educating teens at every health care visit as recommended by the National Heart, Lung and Blood Institute (NHLBI) was one resource available for discussing HTN in a medical setting. This resource can discuss the definition of HTN, as well as any cultural or familial affiliation with this disease from a medical perspective. Additionally if a teen presents with asymptomatic HTN, information can be made available to discuss what normal blood pressure readings are, as well as pre-HTN, and diagnosed stage 1 and stage 2 HTN (Gauer, Belprez, & Rerucha, 2014). The health care visit was also the setting where additional questions and information can be shared especially if there is a family history of HTN.

Another resource for asymptomatic teens is dietary or nutritional counseling. It has been noted that diet and exercise play an important role in maintaining a healthy lifestyle and to lower blood pressure. Patients who have HTN are encouraged to limit their salt intake. Reducing sodium intake can be one of several lifestyle modifications including increased exercise activity and quitting smoking that can reduce a young patients' risk of HTN (Aycock, Kirkendoll, & Gordon, 2013; Gauer et al., 2014; Mangat et al., 2015; Riley, Locke, & Skye, 2011).

A major disparity among African-Americans were undiagnosed and uncontrolled HTN (Aycock et al., 2013). This was particularly important to note for African-American teens and children who may have a family history of HTN. HTN has been called the "silent killer" because it seldom presents noticeable symptoms until serious problems have developed. Often people do not know that they have HTN which delays treatment (Aycock et al., 2013). Teens must be made aware through discussions at their schools, during their health care visits and even at their local church about the potential consequences of undiagnosed HTN, even at their age. Ongoing education is needed at every age level in the African-American community, even in the religious community.

A resource many times overlooked was the local African-American church. The church has been a trusted and frequented organization, a place where health issues are being discussed and explained. The church has long been a trusted and influential establishment in the African-American community. Research dates back to the 1980s has shown that church-based health-promotion and disease-prevention activities have a positive influence on health of African-Americans (Aycock et al., 2013, Hatch & Jackson, 1981, Levin, 1984).

Including children and teens in health promotions in the church was a much needed resource. Health screenings, particularly blood pressure screenings have been identified as the most frequently requested health service need of African-American church congregants (Aycock et al., 2013; Baldwin, Humbles, Armmer, & Crammer, 2001). Participation rates for church-based blood pressure screenings vary, but have been reported at up to 60% when offered as part of a health promotion program (Aycock et al., 2013; Frank & Grubbs, 2008; Williamson & Kautz, 2009).

This resource was currently available to asymptomatic teens and they should be encouraged to participate and to learn more about the effects of HTN on their lives.

Adolescent Knowledge of Screening for HTN

Teens are knowledgeable of their prevalence for HTN. Since the early 1980s, researchers have shown that HBP can appear in children and that this happens more often in African-American children than in White children. Today African-American teens, especially young men, are twice as likely as Whites to have HBP. To learn what they understood a study was conducted (N= 58) by interviewing African-American young men and women ages 17-20 years old who were at high risk and low risk of developing HBP to learn what they knew about

HTN; including the risk, prevention and effects of HTN on their lives. These interviews also asked about their family history and if they thought they were at risk of developing HTN (Savoca, Oakley, Austin, Wideman, Martinek, & Carter, 2013). As reported, with the exception of the young women with a high risk of HTN, few teens had any idea of what a normal blood pressure screening and reading was and few recognized their own risk. Consequently, the teens were aware of HTN, but their focus was not on the dangers of HTN since they believed that HTN can be cured and controlled by medicine only (Savoca et al., 2013). Limited understanding of HTN was evident and their findings support the need for HTN programs focused on young African-Americans.

Programs like the RESPeRATE device are a more focused attempt to teach teens about HTN and the screening process (Wojcicki, Geissler, Stokes, Heyman, & Tran, 2013). The Bogalusa Heart Study that focused on CVD over a now 35 year span, which followed children and young adults noted that these children and young adults developed preventable medical, dental, and social problems. These disabilities can be prevented by helping young individuals achieve healthy lifestyles, focus on good nutrition and physical activity, and understand the damaging effect of unhealthy lifestyles and importance of healthy attitudes (Berenson, 2010).

The RESPeRATE program used a device to lower blood pressure through controlled breathing and music. When teens have information they tended to use the acquired information to improve their health, particularly their HTN (Wojcicki et al., 2013; Berenson, 2010). It was also noted that the higher the teen was at risk of developing HTN, the more apt they were to learn more about the disease and apply prevention methods (Savoca et al., 2013; Wojcicki et al., 2013).

Teen’s knowledge of screening for HTN depended on the severity of the chronic disease in their life, a family history of HTN or relevant health education imparted to them about the disease either through their community or their church (Aycock et al., 2013; Ayotte, Trivedi, & Bosworth, 2009). Additionally, using media campaigns to increase knowledge about obesity and related illnesses or diseases also increase the teen’s knowledge of HTN and screening processes. Children’s Health care of Atlanta, Georgia developed a campaign that aggressively attempted to increase the knowledge base of the community about childhood obesity, with stark and honest struggles of teens recounting their struggles with obesity, including a video message about HTN (Barry, Gollust, McGinty & Niederdeppe, 2014). After viewing the video messages, the teens acknowledge that they better understood HTN and what means, particularly in relation to obesity. Increased awareness of HTN increased the teen’s knowledge base of the importance of understanding screening for HTN at their age (Eakin, Brady, Kandasamy, Fivush & Riekert, 2013; Barry et al., 2014; Lawlor & Smith, 2005).

Summary

A convergence of evidence in the last few decades and the reviews presented here suggest that screening was critical to diagnosis and treatment of HTN. These reviews serve to identify conditions that predict the presence of risk factors resulting in the development of chronic diseases, like HTN. As a result of the work of these researchers, the concept of prevention can be more avidly promoted among the public to reduce the frequency of premature chronic disease development. The literature has identified unequivocally that obesity leads to the development of HTN and other chronic conditions; however it also substantially delineated the importance of screening the non-obese. The screening practices in the non-obese and HTN group have been have been less systematically studied. The overall evidence pointed to school-based screening and consistent clinical screening. Under-diagnosis and misdiagnosis was cited as contributing to the development of HTN. The evidence between screening and racial/ethnic differences in HTN was inconclusive. While race and HTN have been studied exhaustively in relation to obesity and HTN, screening practices and race have not been studied in the context of HTN.

The review on literature of methodology revealed that most studies have been in the form of cross sectional surveys or prevention interventions. Statistical analyses have consisted of either linear or logistic regression. However, there was a dearth of theoretically based studies examining the association of associated risk factors and obesity and HTN. This study was based on the health belief model and explored screening practices for HTN in non-obese adolescents from a health care provider perspective. Unlike the perceived susceptibility construct of the HBM, this study filled a major gap in the literature by examining generalized perceived risk (optimistic bias) among health care providers and when screening was necessary. The next chapter discusses in detail the methodology proposed for this study.

Chapter 3: Research Methodology

Purpose of the Study

The two previous chapters provided a broad overview of this study by describing the background, purpose and significance of the study as well as a review of the literature to understand the academic progress that has been made. The previous two chapters also identified gaps in knowledge related to screening and diagnosis of adolescent HBP or HTN. It was critical to grasp the issues of HTN screening and the short-term and long-term consequences of adolescent HTN. In addition, it should be examined if mandatory screening for HTN should occur from the age of 2 years through adulthood annually (Yoon et al., 2014). The purpose of the study was to determine whether screening was being accomplished if a teen does not fit the standard assessment profile or exhibits common risk factors for HTN. What was not known from a public health perspective was whether consistent and accurate screening methods are being used for non-obese or teens with non-traditional hypertension. Therefore, the opportunity existed to contribute to the greater discussion of how and whether screening methods are based on the health care provider's perceptions of when HBP was needed or less common risk factors through the results of this study.

This chapter outlines the qualitative methods used to assist in exploring those screening methods. This chapter describes the research design and rationale, role of the researcher, participant selection logic, instrumentation, data analysis plan, issues of trustworthiness, and ethical procedures. Validity and reliability issues regarding the qualitative nature of the study are discussed as well.

Research Design and Approach

Research Questions

The primary research question was: What are the perceptions of the health care provider when screening an asymptomatic teen for HBP? Specifically, the research questions included the following:

RQ1: What are the perceptions of health care providers regarding diagnosing teen asymptomatic HBP?

RQ2: What are the perceptions of health care providers regarding their capability to diagnose asymptomatic HBP?

RQ3: What system-based actions do health care providers think are necessary when addressing asymptomatic HBP in African-American teens?

RQ4: What resources are currently available to share with parents on asymptomatic HBP?

Definition of Central Concepts and Phenomena

Many chronic diseases clearly pose a threat to life, but they can be managed. Chronic degenerative diseases, especially heart disease and cancer, are the leading causes of death in the United States (Schneider, 2011, p.177). These types of diseases tend to develop within a longer period, making it difficult sometimes to pinpoint the cause. Adult CVD has been linked to early childhood or adolescent HBP that has continued to be present throughout a teenager’s life. Teens with blood pressure readings that are greater than 90% of the expected range are three times more likely than those with average readings to develop HBP as adults (KidsHealth.org, 2013). In this study I explored the association of screening practices in non-obese African-American live in Northern California and whether their health care provider resided in a rural or urban community. I also examined the prevalence of HBP being undetected. I examined the teens' residence or locations, screening methods and weight and their association with HBP. There was an absence in the current literature that explores the screening practices for teens that are not identified as candidates for HTN. These teens are considered asymptomatic; therefore they are not screened to prevent subsequent CVD in childhood or adulthood (Moyer, 2013).

Diseases that persist can be complicated. Teens can be initially diagnosed with HBP, but progress into other chronic cardiac issues. Adults and children learn to live with their illness usually through medication and lifestyle changes. However, early identification and treatment are necessary to prevent manageable common chronic conditions from becoming unmanageable.

There may be evidence that African American teens tend to be misdiagnosed more often than other teens at a particular hospital, county or city. Approximately 67 million persons in the United States have HBP, and only half of those have their condition under control. An estimated 46,000 deaths could be avoided annually if 70% of patients with HBP were treated according to published guidelines (Patel et al., 2014). According to Riley and Bluhm (2012) HBP in childhood commonly leads to HTN in adulthood and adult HTN was the leading cause of premature death around the world.

According to the United States Preventative Task Force (2013) although HBP was common in adults, approximately five in 100 children and adolescents have HTN. One of the strongest risk factors for HTN in adolescents was being overweight. The question was often asked are only overweight teens being screened for HBP and how often. The central phenomenon of this study will address the perceptions of health care providers in screening asymptomatic teens for HBP.

Research Tradition

As it was already mentioned, the main purpose of this study was to explore screening practices for HTN in an adolescent non-obese population based on the perceptions of the health care provider. For this purpose, the phenomenological approach, particularly descriptive phenomenology which provides a direct description of phenomena aimed at maximum intuitive content (Taylor, 2013) was used since this approach focused on a common meaning of a single individual or group that has lived the experience being studied. The fundamental or foundation for phenomenology was to reduce individual experiences with a phenomenon to a description of the universal essence or the very nature of a thing (Creswell, 2014). For this study, I used individual qualitative interviews to explore adolescent hypertensive screening health consequences, knowledge, attitudes, cultural beliefs and behaviors in order to better elucidate the topic.

Role of the Researcher

The phenomenological approach uses heuristic inquiry which was a form of phenomenological inquiry that brings to the fore the personal experience and insights of the researcher (Patton, 2002). The researcher must have first-hand personal experience with the phenomenon being studied.

Interviewing was an integral part of this study as well; this study allowed for in-depth exploration through interviews of the participants who share this experience. Credible data was gathered, analyzed and interpreted. Data was obtained from reliable and respected sources. According to Patton (2002) rigorous methods for doing research should yield high-quality data, while the researcher should be adequately trained, have experience in and have a successful record of performing research.

The researcher and the research itself must be done in a way to maintain the integrity and the quality of data. The researcher develops a systematic approach that engages in searching for alternative themes, divergent patterns, and rival explanations enhance credibility (Patton, 2002). I ensured that data was focused and clearly demonstrated and discussed. I used triangulation, which made sure that the data was valid by either having an expert review the material and by having the participants review their data for accuracy. Using this method, the data was collected from no less than five, but no more than 25 participants. The participants all had experience screening for HTN as a health care provider with a non-obese teen population. I used in-depth interviews, observations, and artifacts. A composite was then developed from the description of the experiences for this unique group. The data was then interpreted from the experiences into clusters of meaning that form the essences of the study.

Participant Selection Logic

The populations under study were health care providers who are involved with screening for HTN. Health care providers (nurses, pediatricians, and researchers) are the focus of this study. Their observations were crucial to the study because of their direct contact with the adolescent and their parents, as well as the intimate knowledge of the screening process many times on a daily basis.

The participant selection logic included analyzing who would best be able to clearly and succinctly state and identify the screening practices for teens with HTN, particularly non-obese teens who would not necessarily exhibit common risk factors. The participants best able to articulate the answers to HTN questions would be health care professionals; this included anyone that participated in the screening process to include physicians and non-physician medical staff. The logic was ascertained by analyzing data about adolescent HBP screening done in multiple health care settings.

The information was accessed by interviewing the health care providers. The applicable data was garnered by reviewing extensive public record documents and forms, and by recording medical professional interviews. Most information was obtained from the history and physical information of the teens, as well as any preventive or wellness plans to reduce HBP.

This was an approach-driven qualitative research study that focused on finding shared experiences with adolescent HBP as well as purposeful sampling of the participants. It was important for the research study that the data collection was exhaustive. This included self-search, dialogues with others and creative depictions of experience to yield a comprehensive knowledge of information. This began with a series of subjective inquiries and developed into a systematic and definitive exploration (Patton 2002).

The exploration of adolescent HTN screening practices focused on the non-obese population and how screening may affect the initial diagnosis of HBP using the phenomenological study approach. The phenomenological approach allowed for in-depth exploration through interviews as to the thought and attitude patterns among the participants who shared this experience.

Despite the high prevalence and potential risks of HTN in children, physicians often do not recognize the condition in this population. In one study, HTN was diagnosed in only 26 percent of children with documented HBP in an electronic medical record (Riley &Bluhm, 2012).

After obtaining written informed consent from all participants (please see Ethical Procedures section for more details), individual qualitative interviews were conducted to explore adolescent HBP screenings in a non-obese population, knowledge, attitudes, cultural beliefs and behaviors in order to contribute to the public dialogue regarding the best possible screening practices.

Sampling Strategy

Purposive sampling strategy was applied for this qualitative study. This type of sampling was selected because qualitative research uses interview and observation data to demonstrate how the group shares a cultural identity and patterns of behavior (Creswell, 2014). Purposive sampling, also known as judgmental, selective or subjective sampling, was a type of non-probability sampling technique. Non-probability sampling focuses on sampling techniques where the units that are investigated are based on the judgment of the researcher. Qualitative sampling was usually purposive rather than random, small rather than large and theory-driven. This means that qualitative sampling requires continuous refocusing and redrawing of study parameters during fieldwork and that a focus and boundaries must be set (Miles, Huberman, & Saldana, 2013).

The main goal of purposive sampling was to focus on particular characteristics of the population of interest. Using the phenomenological approach coupled with purposive sampling allows the researcher to know why things are the way they are (Taylor, 2013). A subtype of purposive sampling was theoretical sampling; this sampling technique allows for drawing conclusions from theory or practice. With this type of sampling, understanding the intricacies of the study was a major consideration; you may have a theory that such a problem or issue exists, but there was limited or no research that currently supports such a theory. My central concern was to determine from a health care provider’s perspective how screening was determined for diagnosing HTN in teens that may not appear to have the standard characteristics for HTN.

Instrumentation

Primary data collection was an important piece of this research project. The use of the proper techniques guarantees that qualitative data were collected in a scientific and consistent manner. Appropriate data collection techniques strengthened the accuracy, validity and reliability of research outcomes. Ultimately, using these methods helped to achieve the goal of conducting high-quality research. In order to prompt an in-depth discussion about adolescent HTN, questions were asked of the health care provider to determine how they diagnose teens and what screening methods were used and why. No historical or legal documents, as well as secondary data were used as a source of data for the present study. On the contrary, individual qualitative interviews were used to collect the needed qualitative data. Interview questions for designed specifically health care providers or screeners. These questions included:

1. What was your current policy on screening for HTN in teens? (RQ2)
2. Was this a national, state or local policy for HTN screening in teens? (RQ2)
3. Was there a cultural bias in screening for adolescent HTN? (RQ2)
4. What type of screening method or methods do you use to determine blood pressure readings in teens at your location? (RQ2)
5. Describe any inaccuracies or inconsistencies in screening based on weight of the teen? (RQ2)

6. If you are aware of these inaccuracies or inconsistencies, how are they mitigated based on the weight of the child? (RQ2)

7. What type of monitoring was available to teens with HTN? (RQ2)

8. What type of educational material was given to the teen to get a better education of their HTN diagnosis? (RQ2)

9. What should be the role of the local health care provider and public health agencies in providing solutions to better educate you as a health care provider and the teen regarding screening for adolescent HTN? (RQ2)

Although there are only two major categories of RQs, each question had prompts to allow for further discussion. Prompts are as important as the questions themselves in interviews. Prompts do two things: they keep people talking and they rescue you when responses turn to mush (Leech, 2002). Prompts are not scripted like questions; therefore they allow the conversation to flow until it reaches a natural conclusion. The questions above are designed to allow the participant to share personal information and to allow the interviewer to obtain pertinent information. Informal prompts were used when there was a lull in the conversation or when there was a need for the researcher to show continued interest; this can be something as simple as a head nod, raising an eyebrow or a simple word such as yes or wow, to keep the interview alive.

Procedure for Recruitment, Participation and Data Collection

The participants of the study are health care providers who were contacted by me, since I was the one to collect the data. As previously mentioned, written informed consent was obtained as well as a thorough explanation of what the study entails and what their contribution will mean to the study. It was estimated that the qualitative interview process would take no longer than 60 minutes per interview. Potential participants who are health care providers were recruited from the Sacramento, California University pediatric or youth clinic. All interviews were audiotaped and transcribed verbatim by myself. Demographic data was also recorded and transcribed (age, gender, location of screening and age diagnosed) but no names were recorded in order to ensure the anonymity of the participants.

Data Analysis Plan

Data analysis techniques according to Patton (2002) include making sense out of massive amounts of data. This involves reducing the volume of raw information, sifting trivia from significance, identifying significant patterns and constructing a framework for communicating the essence of what the data reveals. The qualitative methodology approach selected for this study contributes to the existing knowledge regarding the effect of screening non-obese teens for HTN (Creswell, 2013). Additionally the software tool used in the data analysis was Atlas.ti. Atlas.ti takes unstructured information and assists the researcher in managing and making sense of it. This software does not do the thinking for the user but helps the user organize and manage those thoughts. It was a purpose-built tool that allows the user to classify, sort and arrange data. It was user-friendly and this software can handle large volumes of data (Atlas.ti, 2014). All qualitative methods employ coding techniques to help organize and analyze the overwhelming amount of data collected during qualitative research. The data was sorted by providing a brief overview of the participants, presenting themes that emerged from the interview data and then illustrating this data. This was supported by examples and quotes from the participants which were demonstrated in order to show a connection (Rudestam &Newton, 2007). The data was displayed in a table or matrix format that was readily readable and discernible.

According to Miles, Huberman and Saldana (2014) codes in qualitative research are used as labels with meaning such as words or short phrases recorded during an interview. The codes are then coded or analyzed. First cycle coding was the assigning of code(s) to a single phrase or entire page of text or chunks of data, while second cycle coding was the process of analysis of the first cycle coding process. First cycle coding methods can be mixed and matched from 25 different approaches including descriptive coding (describes the data), in-vivo coding (using actual words or phrases articulated by the participants) which was the most popular of the coding approaches and a host of others (hypothesis coding, protocol coding, etc.). Second level coding takes the results of in-vivo coding and analyzes the results of what the participants said in their own words to develop patterns or themes across the transcript.

The First Cycle Coding method that was used for my study was in-vivo, because of the participant participation and the coding of that data from their specific language and culture. Again, in-vivo coding was one of the most well-known coding approaches and was appropriate for this study because it honors and capitalizes on the participant's voice, using in their own words.

Interview data was collected, with responses being analyzed separately then collectively. After all data was received and reviewed individually, a telephone call was made to perform a follow-up interview. This expanded the data collection process. Another data analysis strategy used was for concurrent data analysis; going back and forth between existing data and generating strategies for collecting new, often better data (Miles et al., 2014).

Issues of Trustworthiness

The data collected must be trustworthy, credible and of high quality. For my research project on health care providers' perceptions of screening for asymptomatic teen HBP, the data was also representative of the population. The data collected during interviews was deemed valid and credible using the appropriate instrument or data collection tool. According to Maxwell (2013) validity was a controversial concept in qualitative research. Many would rather use the terms trustworthy or authentic to test the data collected. The test conducted on the data collected for HBP was tested after collection. This was accomplished by looking for evidence that could challenge my conclusions (Maxwell, 2013). This data was also tested using member checks. Member checks are systematically soliciting feedback about your data and conclusions from the people you are studying. This was the single most important way of ruling out the possibility of misinterpreting the meaning of what participants say; this was also a way of identifying researcher biases if any (Maxwell, 2013). This allowed me the opportunity to make sure that the data was recorded and reported based on the participant and not what I already knew about HBP personally and generally. Having a clear and deep understanding of the data collected was the goal of goal of any researcher. In qualitative research validating the data was a critical and essential step when presenting information. Qualitative research must have reliability and validity. Reliability refers to the credibility and authenticity of the data; credibility looks for recurring patterns where the weight of the evidence is persuasive (Creswell, 2014). As mentioned before triangulation was supposed to support a finding by showing that at least three independent measures of it agree with it or at least, do not contradict it (Miles et al., 2014); finding at least three sources lays the foundation for either contradicting what I propose or will confirm it.

Controlling and Managing Bias

Qualitative inquiry asserts that getting close enough to the people and their circumstances, whether in an organization, neighborhood or family will yield the true events that are happening. This makes possible understanding both the external observable behaviors and the internal states (worldview, opinions values, attitudes and symbolic constructs). Active participation will help alleviate bias (Patton, 2002).

Collecting qualitative data can be challenging because of the nature of the data itself. Qualitative data can be observations, interviews, documents, and audio/video materials. The advantages of using these types of data are that the researcher has a firsthand experience with the participant, participants can provide historical information, the data can be accessed whenever it was convenient for the researcher and the participant, the data can be collected without being obtrusive and the data can be create interest where they may not have been any (Creswell, 2014). Two challenges for collecting this type of data was time and remaining objective. Observations and interviews take time that the researcher or the participant may not have due to the length of time needed to conduct both data types. Additionally, the researcher may become too focused or too personally involved in the research project and loses their objectivity.

Two strategies that may help to mitigate these challenges was the having a strict time management schedule and understanding bias. Adequate time must be given to prepare for the data collection, getting questions, dates and times finalized before attempting to collect the data. This includes developing a schedule and discussing that schedule with the participants so that neither the researcher nor the participants feel rushed or pressured. Secondly, the researcher must understand that bias was inherent in any study, but it could become more problematic in qualitative studies because of the level of interaction with the participants. The researcher's presence may cause the responses to be limited or bias or even disruptive and most likely will affect how the participants respond during interviews or while being observed. In order to minimize and combat these challenges, the researcher must be cognizant of their role in the study and to explain to the participants at the outset their role in this research project. I was able to control and manage bias based on these strategies that were used in this study.

Qualitative studies evoke emotions, attitudes, as well as weaknesses and strengths of the participants and the researcher. All qualitative methods share a commonality - to collect information in a way that does not restrict or limit participant responses (Soriano, 2013). Managing this aspect included allowing the participants to share information in their own way, at their own pace.

Ethical Procedures

All participants signed consent forms. Integrity was important to both the participants and the researcher. I disclosed all pertinent information and data to study participants, review boards and all needed parties. An ethical issues checklist (Patton, 2002) was used as a guideline for addressing all sections of this research study. This guideline also discussed in depth, informed consent and the protocol for interviewees, interviewers, and health care professionals. Walden IRB Approval no. 03-17-16-0316385 and the University of California, Davis Health System IRB Approval no. 799988-1 ensured that all ethical procedures were adhered to in an academic setting and in a hospital setting; to include approved and signed informed consent forms.

Summary

This study provided a detailed description of experiences and perceptions of health care providers regarding the screening practices for HTN in non-obese teens. My research was based on the principle of purposive sampling strategy after obtaining committee approval and written consent of each participant. Ethical concerns were addressed and managed by me (i.e., I fully informed all participants about the objectives of the study and ensured confidentiality and anonymity of the study). Qualitative data was coded and systematically analyzed and reported in Chapter 4.

Chapter 4: Results

Introduction

The purpose of this qualitative, phenomenological study was to explore the gap in literature by gaining the health care providers' perceptions regarding screening for HTN in asymptomatic adolescent population. Additional purposes included understanding the provider's perceived competence in helping teens understand health care information and treatment regimens and his or her insight as to what actions to take to better diagnose HTN in children and teens. The primary research question was what are the perceptions of the health care provider when screening an asymptomatic teen for HBP? Specifically, the research questions included the following:

> RQ1: What are the perceptions of health care providers regarding diagnosing teen asymptomatic HBP?
>
> RQ2: What are the perceptions of health care providers regarding their capability to diagnose asymptomatic HBP?
>
> RQ3: What system-based actions do health care providers think are necessary when addressing asymptomatic HBP in African-American teens?
>
> RQ4: What resources are currently available to share with parents on asymptomatic HBP?

In this chapter I will present the results of nine health care provider interviews that were conducted during a 2-month period. The setting of the study and demographics of the participants was described, data collection procedures reviewed and data analysis presented, including the specific codes, categories, and themes that emerged from the data. Evidence of trustworthiness, including credibility, transferability, dependability, and confirmability of the findings discussed. Finally, the results of the study, addressing each research question, and a theoretical explanation presented.

Setting

The setting for this study was a university-based teaching hospital with both pediatric and family medicine clinics and health care practitioners. The health care practitioners were recruited from a published hospital website that listed practitioners by specialty. An electronic invitation was sent to each practitioner; practitioners were given a brief study overview that listed the purpose and requirements of the hospital IRB approved study (University of California, Davis IRB approval no. - 799988-1). Practitioners who were interested in participating in the study were asked to contact me through email or telephone and a separate survey link would be sent to them for completion. After the practitioner completed the survey and the inclusion criteria were met, an interview time was set and the interview telephone call commenced.

Nine practitioners agreed to be interviewed as research participants. Each participant was provided a copy of their completed survey for discussion and clarification via telephone. After informed consent was obtained, I collected handwritten field notes during the interviews to record my thoughts throughout the process of each interview and to record any explanation or clarification of survey responses. The results were summarized in a Microsoft Word document that I emailed the participants to check their response for accuracy. Each participant was provided an electronic thank you card for their participation. All identifiable information was removed from the document and each participant was given an alpha-numeric code name. Participants who were pediatricians were given the letter P and a numeric code and participants who were general family medicine practitioners were give the letter F and a numeric code (Table 6). Participants were all affiliated with the University of California, Davis pediatric medical community in Sacramento, California.

Table 6

Details of Health Care Providers

ID	Role	Gender	Year Graduated Medical School	Year Certified in Pediatrics
P1	General Pediatrics	Female	2010	2012
P2	Pediatric Cardiologist	Female	1985	1991
P3	Pediatric Pulmonologist General Pediatrics	Female	1999	2012 2002
P4	No Role Given	Male		
P5	Pediatric Nephrologist General Pediatrics	Female	2007	2014 2010
P6	General Pediatrics	Female	1996	2000
P7	General Pediatrics	Female	1982	1989
P8	General Pediatrics	Female	2012	2015
F1	Pediatric Hospitalist Internal Medicine	Male	1984	None*

*Certified in Internal Medicine -1989, list Pediatrics – no Certification obtained

All audio and document files are stored in a Microsoft Word password protected file and stored on a secure computer.

Demographics

Sixty-one potential participants were contacted to participate in the study via email from the hospital practice directory using purposeful sampling. Purposeful sampling was a tool researchers use to select individuals and locations because they can purposefully elicit information to answer the research question or phenomena being studied (Starks & Trinidad, 2007). Thus, purposeful sampling techniques were used to identify participants who had knowledge and experience with diagnosing and managing children and teens with HTN. Participants (number contacted) included general pediatricians (19) and pediatric specialists to include those who specialize in pediatric cardiology (8), pediatric critical care (10), pediatric emergency medicine (9), pediatric hematology (5), pediatric nephrology (4), and pediatric pulmonology (2). It was noted that one family medicine practitioner was solicited who worked in the general family medicine as a pediatric specialist or hospitalist.

From the potential participants, nine participants agreed to complete the demographic survey and to be interviewed. As shown in Table 6 above, a cross-section of general pediatricians and pediatric specialists contributed to this study. The nine participants were representative of the pediatric groups contacted at U.C. Davis and in comparison with the total solicited participant pool – it was a coincidence that at least one participant was from the each of the contacted pediatric specialties or practices. The common denominator for all potential participants who were asked to participate in the study was having diagnosed a child or teen with HTN, therefore a specific population was targeted and solicited to participate. The limitations of using this participant pool will be discussed in Chapter 5 as well as the influence or effect this has on further or future research.

All of the health care professionals worked with either children or teens and had diagnosed HTN in this population which was a requested criterion before entry into the study. The study sample consisted of nine health care providers – two male and seven female (Table 7)

Table 7

Characteristics of Health Care Providers

Characteristics	Numbers of Individuals
Male	2
Female	7
Average experience	19 years
Profession type	
Pediatrician	6
Pediatric cardiologist	1
Pediatric hospitalist	6
Pediatric pulmonary nephrologist	2
Internal Medicine/Pediatrics	1

Providers self-identified as pediatricians, pediatric pulmonologist, pediatric cardiologist, pediatric nephrologist and an internal medicine physician. The youngest pediatrician has less than one year of experience, while the oldest pediatric practice experience spanned 20 to 25 years. Pediatricians manage the physical, behavioral, and mental health of children from birth until age 21 years. They are trained to diagnose and treat a broad range of childhood illnesses from minor health problems to serious diseases. To become a board certified pediatrician one must have graduated from medical school and completed a three-year residency program in pediatrics. Eight of the nine participants are board-certified pediatricians and all participants have diagnosed HTN in children.

Data Collection

A total of 9 health care providers participated in the study as shown in above. Data collection was conducted from December 28, 2015 through February 1, 2016 under the approval and guidance of the University of California, Davis (U.C. Davis) Institutional Review Board (IRB) – Project #799988-1 as an employee of the University and the Walden University IRB – approval no. 03-17-16-0316385. Oversight and permission was granted by U.C. Davis and Walden University. Participants were given the option of an in person interview or a phone interview. All 9 participants chose the phone interview. Once the participants agreed to participate, the interview was scheduled. The participants were sent the consent form in advance. The first part of the interview consisted of reviewing the purpose of the study and the elements of the consent form. Participants were reminded that the participation was voluntary and that they could stop the interview at any time. It was also emphasized that their privacy would be protected with no identifiable information being disclosed. Participants were provided with a questionnaire prior to the interview and asked to bring that completed document to the interview; a copy was made for the researcher, where field notes were taken directly on the provided questionnaire with the consent of the participant. Clarification and any further explanations were annotated as the interview progressed. During the group conference call, after the initial review of the purpose of the study and after consent was obtained, participants scheduled individual interviews if they needed further clarification. Health care providers then submitted their completed questionnaire and provided contact information is further clarification was needed and left the conference call. Three health care providers participated in the conference call group interview; one health care provider opted to remain anonymous submitting questionnaire responses only and lastly, three health care providers opted for individual interviews. Immediately following all interviews, a transcript of each call was made by entering the complete conversation into a Word document. Once the document was created it was uploaded into Atlas.ti and coded. Following coding, a memo was created describing the interview and expanding on themes or ideas that emerged from the interview. The memos were attached to the transcript in Atlas.ti.

Characteristics of the health care providers are shown in Table 7 above, while experiences of the health care providers are presented in Table 8.

Table 8

HTN Experiences of Health Care Providers

Experience	Number of Individuals
HTN Training Received	
Medical School	7
Residency or Fellowship	6
On the Job Training (Clinic, Hospital or Bedside)	8
Formal HTN Course	0
HTN Guidelines Used	
National	8
Regional	0
Local	1
Different Screening Guidelines for Children vs. Teens	
Yes	3
No	6
HTN Screening Done at Every Teen Visit	
Yes	6
No	2
Not Applicable (N/A)	1

Data was collected in the manner described in Chapter 3 with no variations.

Data Analysis

Using the phenomenological methodology as described by Creswell (2014) data analysis consisted of analyzing statements, the generation of meaning units and the development of an essence description (Moustakas 1994). Most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing visual of the data collected (Saldana, 2009). There are six steps involved in the data collection and analysis of my phenomenological study: (1) conducting personal interviews, (2) transcription of interview data, (3) identification of relevant statements within the transcribed data, (4) determining meaning of identified statements, (5) creating themes of the meaning units and (6) merging themes to create a meaning for the phenomenon under study (Collingridge & Grant, 2008).

The data were coded systematically using Microsoft Word software and were analyzed thematically. Microsoft Word can and was used for coding and retrieving, semi-automated coding and inspection, creating hierarchies of code categories via indexing, global editing of theme codes, coding of a face-sheet data, exploring relationships between fact-sheet codes and conceptual codes, quantifying the frequency of code instances, and annotating text (LaPelle, 2004). Specific examples and techniques proposed by LaPelle (2004) regarding the management and analysis of key informant interviews, literature reviews and open-ended survey questions applied in this study. Survey Monkey, which was also used to create the questionnaire, has a feature that allows for each question to be summarized for ease of finding repetitive statements or codes.

According to the providers answers, several codes were generated such as HTN training, screening guidelines, cuff size, blood pressure measurement, well teen visits, fellowship training, sphygmomanometry, pediatric residency, and height charts. Four major themes emerged were importance of training, importance of screening, screening guidelines uses and available resources for the teen.

In the analysis the four main or major themes manifested and were labeled as the following: importance of training, importance of screening, type of screening guidelines used and monitoring and available information for teens with HTN.

Theme 1: Importance of Training

Importance of training was described as the most important component of successfully diagnosing HTN in teens. All nine providers stated that they were trained in medical school to take blood pressure measurements in adults and children. However, two health care providers stated that, "HTN training during their pediatric residency or fellowship was concentrated on one segment of the population – children and teens, while medical school screening consisted of adults and children" (P4) (F1).

Another health care provider stated that "we are all trained in Medical School, but also trained during my pediatrics cardio fellowship we were trained on how to properly obtain the blood pressure measurement, i.e., proper sized cuff, etc. and with respect to screening- as a specialist I don't actually screen since my patient population has rhythm problems. However, I do assess the BP measurement when my patients come in for office visit" (P2).

All health care providers (P1-P8) (F1) stated that "hypertension training was available in medical school." Two others (P4, P8) stated that "additional training was available during their pediatric residency." Three others (P2, P3, P5) stated that "training was also available during their pediatric specialty fellowship." Training was perceived to be adequate in medical school and honed during fellowship or clinical training

Theme 2: Type of Screening Guideline Used

Type of screening guidelines used emerged as the second them. Seven of the nine participants (P1, P4, P5, P6, P7, P8, and F1) used the national guidelines from the National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents. This was a pocket guide to blood pressure measurement in children (National Heart, Lung and Blood Institute, 2007). This information was also on the American Academy of Pediatrics website as a professional resource (P6). This provider (P6) stated that, "National - Per AAP, children are not screened unless high risk before age 3. For older children, there were different normative data regarding blood pressure and screening done with every visit." Another stated (P2) that "he used local guidelines; I don't know the specific data - but in our clinic we try to obtain the BP on all patients. I do not think this is the norm for the routine screening guidelines in a general PCP office."

Other participants began to discuss what guidelines they used. One participant (P1) stated that, “while working only in an inpatient setting that the primary care doctor or primary pediatrician screens for hypertension.” Another (F1) did not elaborate on screening and why he was not currently screening teens. The others (P1, P2, P3 and P6) screen both children and teens in the same manner; no distinction was made due to age. However, (F1 and P7) stated that “hypertension thresholds differ by age and should be adhered to.” Another (P4) stated that “screening guidelines are different based on height charts,” and (P5) stated that “she screens for children using the guidelines disseminated by the AAP where children are not screened unless high risk before the age of 3 years. For older children there was a different normative data regarding blood pressure screening with every visit.” Lastly, (P8) stated that “for both children and teens, you first look to see if they are >90% of their age/gender/height norms.” All providers (P1-P8 and F1) stated that they use the blood pressure charts for height and weight when diagnosing HTN.

Theme 3: Importance of Screening

Importance of screening was also assessed. All nine providers (P1 - P8 and F1) discussed the importance of screening for HBP in children, especially after routine visits to the clinic. One participant (P1) stated that “that HBP was checked at every well child clinic visit.” Although all providers (P1-P8 and F1) acknowledged that HBP in children leads to HBP in adults if not corrected, one participant (F1) discussed the likelihood of organ damage, kidney or liver and another (P3) stated that, “HBP was usually indicative of kidney disease or another cardiovascular issue, which requires specialized visits.”

Several participants (P2, P3, P4, P5, P6, P7 and P8) are currently screening teens for HBP. However, (P1) and (F1) are not currently screening, if a teen comes in with HBP they are screened by another person that takes the history and physical of the teen when they arrive in clinic.

Theme 4: Monitoring and Information Available to Teen

Monitoring and Information available to teens with HTN emerged as the last major theme. All of the nine providers (P1 - P8 and F1) stated that "they knew monitoring was available and useful for teens with HBP," but none knew of anything material to present to the teen. Responses varied from unsure to home or specialty clinic monitoring for the teen. One participant (P1) stated that, "she was unsure." Another (P7) stated that, "yes there was information," but was did not know what specific information. Another (P2) stated that, "ambulatory BP monitoring or interval office checks, alternatively can monitor with a machine at home." When asked about if information was available to disseminate to teens with HTN, the responses ranged from unsure to good question. One participant (P6) stated that, "I asked a great question and acknowledged that she should know and that she did not know the answer." All nine providers (P1-P8 and F1) acknowledged that material information was available in some form.

After the nine interviews were completed, data saturation was achieved. The interviews were audio-recorded and transcribed. I checked the transcripts for accuracy and completeness and then followed the six steps of thematic approach described by Braun and Clarke (2009). I read the transcripts separately in detail to familiarize myself with the data and to develop initial codes. The codes identified were collapsed into themes from their separate analyses to ensure full coverage of thematic domains. These themes were repeatedly compared and checked against the transcripts in order to identify patterns. Interpretation of themes was informed by literature, objectives of the study and discussion with health care providers. Data analysis was also underpinned by the phenomenological theoretical approach because the intention was to present participants' accounts from their point of view.

As a result of this reviews, I made a list of each statement (not repeating), which became the meaning units of resiliency. Next, I assembled the meaning units into themes, which were synthesized into a description of textures of the experience of resilience with verbatim excerpts. I then established a description of what I experienced in textual description, and how it was experienced in structural descriptions.

I repeated the steps mentioned above for each of the participant's transcript of the experience of resiliency (Moustakas, 1994). I read through each participant's transcript verbatim and field notes several times and selected specific statements. In Chapter 3, it was noted that the qualitative software Atlas.ti was going to be used to input the interview transcripts. There were technical difficulties that did not allow me to download the software onto my computer and after consulting my University IRB they recommended that I code by hand and place these important statements into an Excel or Word spreadsheet; therefore Word was used. I combined them into themes or meaning units for each participant (Creswell, 2009, Moustakas, 1994). The themes began to emerge from the data, as described by Moustakas (1994). For each core theme, I reflected on: (a) Siebert's Resiliency Model, (b) information from the literature review, and (c) my own personal experience of resilience (Longnecker Zink, & Florence 2012,; Huey & Weisz, 1997; Siebert, 2005; Puterman et al., 2013).

After discussing the interviews in detail with the participants; the participants suggested a review of the hospital pediatric clinic data to determine to what extent ethnicity was a factor in the diagnosis of HTN by using the international classification of diseases code (ICD). The ICD was the global health information standard for mortality and morbidity statistics. ICD was increasingly used in clinical care and research to define diseases and study disease patterns, as well as manage health care, monitor outcomes and allocate resources as used by the World Health Organization (WHO, 2016) and as reported to the Centers for Medicare and Medicaid Services. The ICD codes are displayed in Table 9 and Table 10.

Table 9

University of California Davis Medical Center – Pediatric Clinic Data (2010-2015) Pediatric Patients with Diagnosed HTN

Diagnosis	ICD Code	2010	2011	2012	2013	2014	2015
Screening for HTN	V81.1	0	0	0	0	0	0
Unspecified Essential HTN	401.9	152	190	232	304	220	154
Essential HTN	I10	0	0	0	0	0	0
Elevated Blood Pressure Reading Without Diagnosis of HTN	796.2/R03	0	0	0	0	0	0

Note. The data in Columns 3-8 are a retrospective view from the University of California Davis Health System: ICD Code Report for HTN (2010-2015) obtained March 1, 2016 by Peltola G., 2016, Sacramento, CA.

Table 10

University of California Davis Medical Center – Pediatric Clinic Data (2010-2015) African-American/Black Pediatric Hypertensive Patients ages 13-17 years old

Diagnosis	ICD Code	2010	2011	2012	2013	2014	2015
Unspecified Essential HTN	401.9	152	190	232	304	220	154
African-American Teens Only		30	14	10	26	12	6
Male		16	4	6	19	9	6
Female		14	10	4	7	3	0
Elevated Blood Pressure Reading Without Diagnosis of HTN	796.2/R03	0	0	0	0	0	0

Note. The data in Columns 3-8 are a retrospective view from the University of California Davis Health System: ICD Code Report for HTN (2010-2015) obtained March 1, 2016 by Peltola G., 2016, Sacramento, CA.

The data in Table 9 was a retrospective view for those medical records designated for children of all ethnicities less than 18 years old. Major categories or groups identified included African-□Hispanic or Latino. 1,252 medical records were reviewed. Although there was an ICD-9 and ICD-10 code for screening for HTN in pediatric patients, it was rarely used and when used, none identified were African-American teenagers. The most commonly used ICD-9 code was 401.9 which was Unspecified Essential HTN - essential HTN was considered to be HBP that does not have a known secondary cause. Essential or primary HTN was generally considered a disease of adulthood, with a prevalence of 30%, and although it was thought to be less common in children, it has its beginnings in childhood. The diagnosis of HTN in children was more complicated than in adults and thus remains frequently underdiagnosed (Gupta-Malhotra et al., 2015).

Table 10 was also a retrospective view of 1,252 cases of essential HTN seen from January 1, 2010 – September 30, 2015 in both an inpatient and outpatient setting. 98 African-American or Black teens were diagnosed with unspecified essential HTN and three teens exhibited an elevated blood pressure reading without a diagnosis of HTN. 8% of the teens seen and diagnosed with HTN were African-American and correlates with the participants' responses when interviewed about cultural bias in screening for HTN; all participants responded with a "no", there was no cultural bias in screening for HTN. Figure 1 shows how ethnic data was collected and all participants agreed that there was not a huge pool of African-American teens in their clinics or other outpatient settings and if there were, they would be screened in the same manner as other ethnicities. Two study participants did acknowledge bias due to weight of patient, because of the standard cuff size for measuring HBP may not be adequate to take an accurate blood pressure reading.

UCDAVIS
HEALTH SYSTEM

Collection of Primary Language, Race and Ethnicity

We are asking about your language, race and ethnicity. We ask this information of all of our patients. The choice to provide it is yours. If you chose not to answer, the quality of your care will not be affected.

In what **Language** do you feel most comfortable speaking with your doctor or nurse? *Please check one.*

☐ Albanian
☐ Arabic
☐ Armenian
☐ Cambodian
☐ Cantonese
☐ Chavakano
☐ Croatian
☐ Czech
☐ Dutch
☐ English
☐ Farsi
☐ Filipino
☐ French
☐ German
☐ Greek
☐ Hebrew
☐ Hindi
☐ Hmong
☐ Hungarian
☐ Ilocano
☐ Italian
☐ Japanese
☐ Korean
☐ Lao
☐ Mandarin
☐ Mien
☐ Polish
☐ Portuguese
☐ Punjabi
☐ Romanian
☐ Russian
☐ Samoan
☐ Sign language (American)
☐ Sign language (other)
☐ Spanish
☐ Swedish
☐ Tagalog
☐ Thai
☐ Tongan
☐ Turkish
☐ Ukrainian
☐ Urdu
☐ Vietnamese
☐ Visayan
☐ Yugoslav
☐ Other: ______
☐ Decline to state
☐ Unable to respond
☐ Unavailable or unknown

Now we would like you to tell us your **Race** and Ethnic Background. We use this information to review the treatment patients receive and make sure everyone receives the highest quality of care.

First, do you consider yourself Hispanic/Latino: ☐ Yes ☐ No

Please tell us your Race. By race, we mean the major world group or groups from which your ancestors came. *Check as many categories as you need to describe yourself.*

☐ African American or Black
☐ American Indian or Alaska Native
☐ Native Hawaiian or other Pacific Islander
☐ Asian
☐ White
☐ Other: ______
☐ Decline to state
☐ Unable to respond
☐ Unavailable or unknown

We would like you to describe your **Ethnic Background**. By ethnicity, we mean the group or groups with whom you share your cultural identity or customs. *Please, check as many categories as you need to describe your specific ethnicity.*

☐ African
☐ Black or African American
☐ Alaskan Native
☐ Armenian
☐ Arab
☐ Asian Indian
☐ California Tribes
☐ Cambodian
☐ Central American
☐ Chamorro
☐ Cherokee
☐ Chicano
☐ Chinese
☐ Croatian
☐ Cuban
☐ Dominican
☐ European
☐ Fijian
☐ Filipino
☐ French
☐ German
☐ Hmong
☐ Irish
☐ Italian
☐ Israeli
☐ Iranian
☐ Japanese
☐ Jamaican
☐ Korean
☐ Laotian
☐ Mexican
☐ Mexican American
☐ Mexican American Indian
☐ Middle Eastern or North Africa
☐ Malaysian
☐ Micronesian
☐ Mien
☐ Native Hawaiian
☐ Other Pacific Islander
☐ Polish
☐ Puerto Rican
☐ Russian
☐ South American
☐ Samoan
☐ Scottish
☐ South American Indian
☐ Taiwanese
☐ Tongan
☐ Thai
☐ Vietnamese
☐ Other: ______
☐ Decline to state
☐ Unable to respond
☐ Unavailable or unknown

Figure 1. Collection of Primary Language, Race and Ethnicity Race - Descriptions for Patients Receiving Care at the University of California Davis Health System – Sacramento, CA retrieved March 15, 2016 from intranet.ucdmc.ucdavis.edu/emr/emrnews/documents. Copyright 2010, Reprinted with permission.

Evidence of Trustworthiness

Credibility was assured by following the interview guides and keeping the interview focused on the research questions. Credibility was also established because I was surprised at the results which demonstrated open-mindedness. Lastly credibility was also achieved through member checking, this was accomplished by giving the research participants a summary of the data and allowing feedback. This feedback was useful in the analysis and interpretation of the data and in drawing conclusions.

Transferability falls to researcher and to the person seeking to apply the information (Morse, 2015). Transferability was maintained by using inquiry auditing, these are notes related to data collection and analysis process, by placing my reactions and thoughts on the original transcript. In addition, each participant reviewed their data for consistency and accuracy.

Dependability was established by interviewing health care professionals who perform HBP diagnosis. Transcripts of the interviews as well as the codes, categories and themes were sent to the chair of the dissertation committee as well as the methodology expert. Coding was conducted immediately after the transcription by me. The transcript was developed by listening to the audio recording and by typing the word for word response to each question. Transcribing the recording verbatim allowed me an additional review of the exact words and phrases that were used by the participants.

Validity and conformability was established by becoming more aware of the theoretical significance. This was further confirmed through the findings that were not expected. Validation was established by sending the interviews to the participants for correction if needed, no corrections were needed.

Results

The results of the study are based on the answers provided by the health care providers that led to the study findings. Each interview question was an attempt to answer each research question. In this section, I addressed each research question with the responses of the participants. With each question, themes emerged from the responses of the participants.

I used a total of 17 questions to collect data from the participants. The first three were demographic in nature. The next twelve questions related to the factors considered when health care providers offer screening to teenagers to determine if they have HTN. After reading the transcripts three times and reviewing the notes taken during the interviews, significant statements extracted that were closely related to research question and specific findings emerged that aligned with the major themes discussed.

Connection to Research Questions

One of the most important aspects of research design was the research question. The research questions indicate what needs to be learned and understood. The research questions, according to Maxwell (2005), help us to focus the study, and provide guidance on how to conduct the study and communicate goals of the research.

Research Question 1

For the first research question regarding the perceptions of health care providers regarding diagnosing an African American teen with asymptomatic high blood pressure, the results indicated that the providers perceptions varied based on the level of training received, the type of screening guidelines used, the providers' perception of importance of screening in general and with an African American population specifically and how monitoring of HBP was done, as well as information given to the teen at the moment of diagnosis. Findings also indicated that HBP training with the pediatric population will determine how effective health care providers are with screening for HBP. This was consistent with data that has led several prominent medical organizations—including the American Heart Association, the National High Blood Pressure Education Program, National Heart Lung and Blood Institute, the European Society of HTN, and the American Academy of Pediatrics—to publish guidelines emphasizing the importance of BP screening in childhood. The rationale for these recommendations was that early identification of a preventable and treatable condition could lead to increased health and decreased cardiovascular mortality

Research Question 2

The second research question addressed the health care providers' perceptions of their capability to diagnose asymptomatic HBP. HTN training and understanding the nationally published guidelines for children was important when diagnosing asymptomatic teens. HTN has become increasingly prevalent in children. HTN that begins in childhood can carry on into adulthood, therefore early detection, accurate diagnosis and effective therapy of HBP may improve long-term outcomes of children and adolescents. The gold standard diagnosing HBP in children and adolescents was developed by the National High Blood Pressure Education Program Working Group. This group provided a strategy for cardiovascular health promotion, proposing BP monitoring as a part of an extended program of pediatric health care. The Fourth Report on High Blood Pressure in Children and Adolescents (Fourth Report) and subsequently the recommendations of the European Society of HTN suggested that BP should be checked systematically during an annual physical exam in children older than 3 years through adolescence. It was noteworthy that normal BP values for pediatric ages are really different from those in adulthood. In the past decades, the definition of normative values for BP for pediatric ages has increasingly been recognized as an important issue in clinical practice and public health because of the changing patterns in epidemiology and associated determinants of HTN among children (Vidal, Murer, Matteucci, 2013).

The results indicated that the health care providers in this study considered themselves capable of diagnosing asymptomatic blood pressure in teens based on the training and clinical practice that has been received in their respective medical practices.

Research Question 3

The third research question related to system-based actions that health care providers think are necessary when addressing asymptomatic HBP in African-American teens. The results related that there was no cultural bias in either the inpatient or outpatient settings when diagnosing HBP in African-American teens. Experiences were related however, concerning cuff size in teens, some whom have been African American and overweight. Not having the proper cuff to measure HBP can be problematic and results in many pediatricians using the adult cuff to measure a teenager; therefore many will use the adult HBP guide as well. The correct BP measurement in children requires the employment of BP cuffs appropriate for the upper right arm size. An adequate cuff should be characterized by a 1:2 width to length ratio, and the Working Group proposed a classification of seven cuffs according to age range (newborn, infant, child, small adult, adult, large adult and thigh). According to the current available recommendations by the Working Group identified above, BP in children should be measured with conventional mercury or aneroid sphygmomanometer, thus employing the auscultatory method. Both mercury and aneroid devices are subject to significant observer issues (Vidal et al., 2013).

The health care providers in this study discussed at length, that having the proper cuff size was critical in their determination of HTN and sorely needed in every clinic. These providers were concerned that not having all the cuff sizes that are recommended on hand in their practice setting and they reiterated how important cuff size was in the accurate diagnosing of HBP

The results also addressed monitoring HBP in teens. This was a direct result from the diagnosis of asymptomatic HBP. Although health care providers were unsure of how this was accomplished; home monitoring with a HBP machine, as well as interval office checks or clinic visits was suggested. In addition, 24 hour home monitoring with a blood pressure machine to confirm before treatment with medication and lifestyle changes were also identified as monitoring methods. (

The results also indicated that there are still concerns that persist about the right instruments, modalities and standards of reference that should be used in routine practice. The health care providers noted that having a consistent tools and charts aids in early detection of HBP in children and teens. Although height and weight charts are used, as a child grows and matures, this can consistently and constantly change throughout childhood. Therefore in a clinical setting, it was recommended that before a diagnosis of HBP was given or considered, multiple readings (3 at least) taken on separate occasions over a period of time be completed. BP percentiles have been calculated for each sex, age group and for 7 height percentile categories. A child's height percentile should be identified according to the growth charts of the CDC (2015).

Although the health care providers in this study have diagnosed and screened African-American teens for HBP, the training, guidelines and cuff sizes are not culturally based or biased. The health care providers acknowledged that there was normally a higher incidence of HTN in African American families; subsequently family history was an important element in screening for HBP in all ethnic and high risk groups. Because HTN does not have visible symptoms, HTN in many people was undiagnosed until the occurrence of a cardiac event (e.g., heart attack or stroke). An estimated 16.1% of adults nationwide meet the clinical criteria for HTN but are undiagnosed, with African Americans comprising 25% of these undiagnosed cases (Diaz et al., 2004; Graham et al., 2006). One study of 14,187 African American and Hispanic children found that 74% of the participants met the clinical criteria for HTN but were undiagnosed (Hansen, Gunn, & Kaelber, 2007).

Research Question 4

Lastly, the fourth research question focused on resources that are currently available to share with teens and their parents on asymptomatic HBP. The results demonstrated that information was available to share with teens and parents when the asymptomatic teen was diagnosed with HBP. The health care providers knew there were resources available to share with the teen and parent; however, none knew exactly what that was for the institution or clinic.

The results indicated those resources ranged from recommendations of lifestyle changes before prescribing medication to prescribing the teen to increase physical activity and change eating habits.

Health Belief Model

The results also indicated that the health care providers' attitudes and beliefs for screening and diagnosis of HTN in teenagers have a direct influence on what information was disseminated. As discussed earlier, the HBM has six constructs; perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (Hoseini et al., 2014). The health care providers' cues to action were based on the ramifications of undiagnosed HTN in children. Health care providers' act upon the cues given during an examination, if there are no barriers present; the perceived barriers are the cost of having the different sized HBP cuffs in every inpatient and outpatient setting.

The health care provider perceptions towards the benefit of screening does factor into how this was accomplished at all levels. The study participants had all seen teen patients in either an inpatient or outpatient setting or both. In the inpatient setting, which was a patient in the hospital, other providers (nurses, medical students, residents or fellows) may or may not identify HTN as a primary concern, and in the outpatient setting, which was the clinic, the pediatrician or primary care physician will identify or screen for HTN. Initial assessments shared by the participants was that sometimes they are not focused on diagnosing HTN during the first visit; they subscribe to the practice that after three visits, they will make an assessment and diagnosis. They are however focused on the perceived benefit gained by realizing that as a physician group, a consistent protocol to screen all children and teens using the national guidelines requires training and implementation at the local, regional and national levels.

Health care providers' assessment of the perceived barriers to treatment does factor in the diagnosis of HTN. The participants shared that the diagnosis will be inconsistent or inaccurate if : (a) if using the wrong-sized , too long or too short blood pressure cuff, (b) height was used to determine percentile ranges for HTN, (c) blood pressure varies by age, gender, and height. The etiologies of HTN in children are variable, unlike in adults. Adolescents may develop HTN at any weight, and (d) if they are overweight they may be allowed to have blood pressure too high for their ideal body weight.

The health belief model as it was used in this study was evident because health providers do develop insight into what tools and protocols are needed to consistently and properly screen and diagnose HBP in adolescents; however, these observations do not interfere with their responsibility in screening teens in order to identify those at risk of developing HBP. Consequently, their experience changes the way they deal with certain children and teens. Conversations and approaches may vary but the care remains the same and all teens are screening for HBP and resources are made available to those that need them.

Summary

During this study, I have gained a better understanding of how HBP screening was viewed by health care providers and how their views affect their screening and diagnosis in teens. I examined the health belief model from the perspective of health care providers as it relates to their decision making process in HBP screening in asymptomatic teens. Finally, as a result of the data collected I described the factors considered by health care providers in implementing HBP screening for teenagers. I also demonstrated the importance of education in that effort and expanded the use of the health belief model. As a result of the outcome of the analysis, the following inferences can be noted; in relation to research questions one and two, the health care providers considered the training they received, the national HTN guidelines for children and other factors in their decision making process. Their experience was also a factor as well. In relation to research question three health care providers identified differences in diagnosis based on their practice location; either in an inpatient or hospital setting, HBP diagnosis was secondary in an outpatient or clinic setting screening and diagnosis was primary. Health care providers also expressed concern with not having the proper blood pressure measurement equipment for children including the correct size blood pressure cuffs. In relation to research question four, health care providers understood the need to provide resources for teens and parents after a diagnosis of HBP but are unsure as to what resources and materials are disseminated. The HBM as used in this study indicated that health care providers do develop perceptions of the screening and diagnosis process based on their training and years of experience; however, this does not usually interfere with their responsibility in screening patients to identify HBP in asymptomatic teens. Consequently, it does change the way they deal with this patient population. Conversations and approaches may vary but the care remains the same and teens are screened with resources made available to those who need it. Chapter 5 includes an introduction and summation of the findings, interpretation of the findings, limitation of the study, recommendations for further study, and implications for social change.

Chapter 5: Discussion, Conclusions and Recommendations

Introduction

Childhood HTN has become a widely investigated topic in the past decade because of its increasing prevalence. Childhood HTN was often asymptomatic (Ma, Liu, Liu, Yin, & Lu, 2016). The purpose of this study was to seek to understand the perceptions of health care providers surrounding the screening practices and tools used to detect HBP in asymptomatic teens based on their experience with the current screening methodologies. Prevalence of childhood HTN was constantly rising, early detection was therefore, important to reduce progression of adult HTN and premature development of organ damage. Early detection was also important to for establishing early treatment of all associated risk factors. In adolescents blood pressure values vary with height, age, and gender, making it impossible to use a specific blood pressure level to define *hypertension*, as it was defined for adults (Totaro et al., 2013). For this qualitative, phenomenological study, I conducted in-depth interviews with nine health care providers who diagnose HTN in teens in a hospital or primary care setting in Sacramento, California to determine their perceptions in screening asymptomatic African-American teens.

Using the phenomenological methodology was useful in health care settings to gain understanding from personal experiences. A gap exists from a health care provider perspective for screening asymptomatic teens who do not exhibit standard HBP protocols (i.e., obesity or family history). Understanding the views of the health care providers who diagnose this population informs the researcher of what providers perceive needs to be done to improve the screening process process among this patient population.

Participants were recruited from pediatricians and family medicine practitioners working at a local university hospital because of the diverse population and geographic area of responsibility. Study participants were asked to complete a demographic survey and a one questionnaire. After careful analysis, four major themes emerged that will be discussed in interpretation of findings. In addition, I will discuss results in relation to the literature, limitations of the study, recommendations for further research, implications for positive social change and the conclusion of the research study.

Interpretation of Findings

The four major themes which are the key findings in the study are: 1. the importance of training, 2. the importance of screening, 3. the type of screening guidelines used and 4. Monitoring and available information for teens with HTN. The interpretation of these findings affects the diagnosis and treatment of teens with HTN.

As discussed in Chapter 4, the importance of these findings affects health care providers’ views and understanding diagnosing HBP in a teen population. The importance of training a health care provider on screening, diagnosis and treatment of HBP in teens was vastly different than that same process in adults. Essential HTN was the most frequent type of HTN in adults; some studies report as high as 95% and were diagnosed when there was sustained elevation of BP greater than 140/90mm Hg and when no etiology can be determined for the HTN. However, the diagnosis of HTN in children was more complicated than in adults and thus remains frequently underdiagnosed (Gupta-Malhotra, et al., 2015). Proper training can increase the diagnosis of teens with HTN. Physicians are trained throughout medical school and their specialty practice training. The health care providers discussed the different training levels received based on the guidelines used and the patient population exposed to during that training. For example, if a pediatric experience did not include teens or if the experience was limited, the ability to recognize and diagnose HBP in that patient population would be limited as well. A study was conducted to understand pediatricians concerns with diagnosing HBP; from this study, 5 major themes related to educational needs and clinical concerns were found: 1. utilization of resources to define blood pressure (BP), 2. Correct BP measurement method(s), 3. Co-morbidities, 4. Barriers to care, and 5. Experience level with HTN. 6 minor themes were also identified: 1. differences in BP measurement, 2. accuracy of BP, 3. recognition of HTN, 4. practice pattern of care, 5. education of families and patients, and 6. differences in level of training (Cha, Chisolm, & Mahan, 2014). These authors concluded that there are multiple methods to approach education regarding pediatric HBP. For primary care pediatricians based on provider preferences and multiple educational activities should be pursued to achieve best outcomes.

Training can also improve the screening process. As stated above, if the training environment was limited, the number of patients with a HBP diagnosis was limited. Recognizing HBP can be problematic, especially if the teen does not exhibit the common characteristics of HBP. Health care providers screen teens based on local, regional or national guidelines. The health care providers should also be aware of the various diagnostic tools that can be used and what types of tools can produce false positive results or vary between HBP measurements. Clinicians should recognize that there was an increasing prevalence of HTN in children and adolescents. However, screening with sphygmomanometry can be associated with false-positive results, in which elevated blood pressure normalizes in subsequent measurements. The National High Blood Pressure Education Program provides guidance on optimal blood pressure measurement techniques to help ensure that blood pressure values are truly elevated, rather than falsely elevated because of measurement error or anxiety and discomfort in the child (Mabry-Hernandez, Chu, 2015). Understanding the importance of screening and utilizing the proper screening methods and tools can improve the percentage of correct initial diagnosis.

The third major theme was the type of screening guidelines used. As discussed in the second major theme, the participants in the study were trained in different ways using various guidelines to screen for HBP in teens. The health care providers in the study were trained using the national guidelines set forth by the American Academy of Pediatrics (AAP) in medical school. These guidelines are provided by the National, Heart, Lung and Blood Institute (NHLBI) Blood Pressure Levels for Boys and Girls by Age and Height Percentile (ihcw.aap.org). This was the most commonly used chart and considered the gold standard to diagnose HBP in teens. However, as the health care providers discussed, local hospital or regional guidelines were used. Health care providers also acknowledged that different methods have been proposed to simplify the diagnosis of HBP in children and adolescents; these methods can include the use of mathematical formulas, while others use simplified tables. The health care providers also discussed the importance of following the gold standard which uses simplified charts or tables. Using a consistent and national chart improved the health care providers' ability to diagnose and screen for HBP in teens universally.

The fourth and final theme was the importance of monitoring those teens diagnosed with HBP and providing them with resources to manage this condition. Of the nine health care providers who answered this question on the questionnaire, none could fully articulate what resources were available to provide to the teen. Although the health care provider discussed the diagnosis and treatment plan with the teen, the provider did not know what resources were given to the teen.

Monitoring HBP in teens, when diagnosed in a clinic setting was usually resolved by having the teen come back for repeated tests and follow up appointments. Once a teen was diagnosed with HTN, the next steps that a health care provider uses were critical to the management of this illness or chronic disease. The health care providers in this study discussed both "white coat HTN" and "masked HTN" from a clinical perspective. When taking a teen's blood pressure in an office or clinic setting, the health care provider must be aware of these two phenomena. One author stated that the one potential flaw of using office blood pressure measurements alone was the possibility of misidentifying patients as having HTN when, in fact, their blood pressures are normal (Lande & Flynn, 2009). This phenomenon, known as white coat HTN, may be seen in up to 60% of children referred for the evaluation of elevated blood pressure. If this was the case, then further evaluation or monitoring was not necessary. Masked HTN was the complete opposite of white coat HTN. If a teen has masked HTN, which was when office blood pressures are normal but the child or adolescent was actually hypertensive. This was particularly important to identify children or teens with underlying renal disease, in who elevated blood pressures may contribute to progression (Lande & Flynn, 2009). Patients with severe HTN and target-organ damage require immediate attention. For other patients, several measurements of BP should be made at weekly intervals to determine if the elevation was sustained. Patients with stage I HTN should be seen again in 1-2 weeks. Those with stage II HTN should be reevaluated in 1 week or sooner if the patient was symptomatic (Lande and Flynn, 2009).

Lande and Flynn (2009) recommend monitoring hypertensive teens using ambulatory blood pressure monitoring; a technique that was finding greater application in the evaluation of children with elevated blood pressure. These authors concluded that ambulatory blood pressure monitoring (ABPM) should be used to confirm HTN in otherwise healthy children and adolescents. All nine of my health care providers in this study recommended ABPM and recommended that the teen have at least two more clinic or hospital visits before the teen was diagnosed with HBP. The national guidelines advocate for at least 2 examinations to confirm that HBP was present. In patients with

HTN, proceed from simple tests that can be performed in an ambulatory setting to complex noninvasive tests and finally to invasive tests. Findings from the history and physical examination dictate the appropriate choice of tests (AAP, 2015).

Data available for teens was usually through obesity management. Many studies show a direct correlation between obesity and HBP (Rodriquez et al., 2010, Dhuper et al., 2011, Diaz et al., 2004, Han, Lawlor & Kim, 2010). Obese children have approximately a 3-fold higher risk for HTN than non-obese children. As many as 41% of children with HBP have LVH (Dhuper et al., 2011). Almost 60% of children with persistent elevated BP have relative weights greater than 120% of the median for their sex, height, and age (Diaz et al., 2004). As in adults, in whom abdominal girth correlates to elevated blood pressure, studies show that this measurement was also to be considered in the assessment of a teenager with suspected BP elevation at an early age (Rodriquez et al., 2010, Flynn, 2013). Information provided to the teen and their family was obesity oriented as part of a lifestyle medication program. Lifestyle modification programs to lower blood pressure are part of a patient education program. Parents, caregivers, and teens must be properly advised about restriction of exercise, when appropriate. They must also be informed about the potential adverse effects of medication (Anglum, 2009). Finally, it was vital to educate parents, caregivers, and children about the potential complications of persistent HTN.

Patient education was an area that my health care providers knew existed, but were unsure what exactly it was. The comments spanned the range of unsure to knowing something was shared with the teen, in general terms, but nothing specific. This particular finding demonstrates the importance of providing the hypertensive teen with disease management information.

As stated previously, increasing rates of HTN in children and adolescents are correlated to risk for coronary artery disease in adulthood (Falkner et al., 2010, Matoo et al, 2012). Nonpharmacological management includes lifestyle modifications addressing weight reduction, physical activity, and dietary modification. Pharmacologic management was typically reserved for patients with severe HTN or those who do not respond to lifestyle modifications. Early intervention was critical for preventing target-organ damage and complications of long-term HTN. Many children and adolescents can successfully lower blood pressure readings through nonpharmacological lifestyle changes (McCrindle, 2010). Education about lifestyle modification strategies should focus on family-based changes in order to increase likelihood of successful implementation (Anglum, 2009). The focus for teens was nonpharmacological; not using medications. Nonpharmacological treatment with lifestyle modifications was recommended as the initial step in the management of asymptomatic, uncomplicated primary HTN in children and adolescents (NHBPEP, 2004). Family-based intervention, including counseling of parents, greatly increases the likelihood of successful implementation of the lifestyle modifications (Anglum, 2009). Families should be included in the education about weight loss in order to provide support and guidance at home. Referral for nutrition counseling may be a helpful family-based intervention. First, dietary modifications should be made with the objective of weight loss in order to achieve the most significant blood pressure reduction (Peters & Flack, 2003). Increasing fruit and vegetable intake, increasing fiber and nonfat dairy intake, and decreasing energy-dense snacks and beverages are important steps in reducing overall calorie intake (NHBPEP, 2004). Overweight children and adolescents are counseled on portion control as a part of weight loss teaching. There are mixed reports of the effects of increasing calcium and potassium intake on weight loss and blood pressure reduction (Peters & Flack, 2003). For African Americans, salt restriction was an important dietary modification that directly influenced blood pressure. Children and adolescents aged 9 year and above should limit their sodium intake as prescribed by national standards (NHBPEP, 2004).

Introduction of pharmacologic agents as a component of HTN management in children and adolescents was typically reserved for patients who have severe HTN (Anglum, 2009). Studies show that HBP medication was designed for adults and that proper dosage based on height and weight was inaccurate and dangerous for children. Medications proven safe for children and teens; diuretics and beta-blockers were the first agents to be used in children and continue to be used commonly based on their proven safety and efficacy (Luma & Spiotta, 2006).

Once a diagnosis of HTN was established and secondary causes have been eliminated, providers should begin to educate both the patient and the families about lifestyle modifications. The International Pediatric HTN Association Web site has a list of resources for parents and families with information about pediatric HTN and its diagnosis and management (www.pediatricHTN.org/links.asp). Aggressive measures should be taken to manage obesity, improve diet, and increase physical activity. If the patient's blood pressure remains elevated despite lifestyle modifications, or if the patient was unable or unwilling to comply with recommended modifications, pharmacologic treatment may be indicated. Patients and families are educated of the need for medication which may decrease with continued adherence to lifestyle modifications and weight loss. Early diagnosis and aggressive intervention are critical steps in improving control of primary HTN in children and adolescents and decreasing risk for CVD in adulthood. (Anglum, 2009).

Limitations of the Study

There were several limitations of this study. As discussed in Chapter 4, soliciting health care providers from one institution and from one practice group affected the study and limited the discussion. Health care professionals that diagnose and treat children and teens can be from various medical specialties and medical professions. It was mentioned by one participant that nurses, physician assistants or other medical professionals can identify HTN. Furthermore, family practice or internal medicine physicians may see a teen in a private practice or neighborhood clinic and then refer the teen to a pediatrician for further tests. Although the nine health care providers that were a part of this study were representative of the pediatric specialties that would diagnose and treat HTN in children and teens. However, a broader participant pool would showcase what diagnostic tools and treatment are being used in a non-traditional setting. Although this research participant pool represented various pediatric specialties, it did not focus on the length of pediatric training needed to accurately diagnose HTN or the experience level needed. Therefore, the study was limited to anyone who had diagnosed a child or teen with HTN. In addition, the results may not account for the national trend in the increase of adolescent HBP in normal weight or non-obese African-American teens. The number of health care providers in this study who had diagnosed African-American teens or who had African-American patients could not be determined since physician-specific hospital or clinic patient data was not reviewed. Also, the hospital data reviewed by CPT code listed HTN as a secondary diagnosis, not as the primary diagnoses; perhaps a more in-depth review of clinic data may yield different results.

When considering generalizing the findings to health care providers it should be with the understanding that not all health care providers have the same training or use the same guidelines.

The study was also limited by the patient population studied, which was African-American teens and expanded to accurately reflect findings for a specific race or gender. Likewise, the demographic data did not differentiate between children and teens. The term *pediatric* encompasses those children between the ages of 0-17 years. Although the focus was on adolescents, the health care providers tended to classify that age spread as pediatrics and not necessarily as children and teens, which are two separate and distinct patient populations.

Therefore, this classification did not allow for the data to be analyzed deeper while examining the differences in these distinct populations.

Another limitation was that the data was only collected from one hospital, in one county, in California, which prevented the data from being generalized to the entire state. Also, the qualitative survey data collected also utilized a small sample size which yielded a participant pool that may not be indicative of the health care provider population at this institution.

This last limitation in the research was that health care providers were from a fairly homogenous racial, ethnic and medical background, as noted in Table 1. The overwhelming majority of health care providers were female and pediatricians; thus the results may be different depending on gender, medical profession or age and experience of the health care provider studied.

In summary, the findings were based on a single-hospital experience, small sample size (n=9) and over a short time frame (1 month), which had potential implications for generalizability of the results.

Recommendations for Action

Action should be directed towards standardized guidelines and HBP equipment needed for teens who with may be diagnosed. Even though the scope of this research was small, the percentage of health care providers who answered in a normalized fashion universally agreed concerning the importance of observing the HBP guidelines and equipment needed to adequately diagnose HBP in a teen population. Realizing that the health care providers' frame of reference was determined by their training and subsequent clinical practice, replication of this study in a community hospital or on a larger scale, in a more racially diverse physician group and patient population, may yield different results. Lantz (2013) noted that statistical significance has been thought to be the same as practical significance. It was not as much the population size, as it was the degree of practical significance to the study. While this was not to imply that a larger population would add strength to the results, this research data can add to the educational efforts in the population studies.

The purpose of this research was to explore the perceptions of health care providers who screen and diagnose African-American teen HTN in an asymptomatic population seen at the University of California Davis Medical Center, Sacramento, California. The research sought to understand from a health care providers’ perspective the screening protocol for teens screened for HTN. The results demonstrated a need for better screening tools, better training guidelines, proper equipment and standardized guidelines. Using multiple educational methods to address pediatric HTN, a design should be implemented to recognize, evaluate and manage this topic.

Recommendations for Further Research

This doctoral study focused on health care providers’ perceptions for screening asymptomatic HBP in African-American teens. Further research in the area of HBP screening done in schools where all teens can be screened, would establish a baseline and allow for follow-up screening to be accomplished on a consistent basis. African-American teens experience higher diagnosis of HBP than other ethnic groups. In the literature review, future research could be expanded using a pharmacist led intervention (Romero et al., 2015). If school class time was not able to be used, possible venues to conduct teen screening clinics include the local YMCA or summer camps for teens. While both of these venues could contain only those teens whose families have the means and access to these facilities, accommodations could be made to others who wish to attend the teen screening clinic from the local community.

A large-scale project would be recommended to determine if the opinions of the health care providers on training and equipment needs was universally recognized across various medical backgrounds. This includes nurses, physician assistants or other health care providers who can diagnose and screen for teen HBP. There could be large or small differences based on these factors for screening and diagnosis.

As discussed in Chapter 4, further research should make an effort to determine if there was a significant sample size of a particular race or ethnic background present to yield the data needed based on those attributes. During this study, it was noted that many children and teens had more than one racial and ethnic background selected and that not all institutions use the same identifiers of race and ethnicity. In a global world many children identify with many cultures, racial backgrounds and ethnic groups and have the option of selecting as many as they wish to identify for demographic purposes. It may no longer be feasible to attempt to identify a certain cultural or racial background, instead focus on symptom-based qualifiers.

Understanding how nurses or other non-physician roles interact with teens diagnosed with HTN was an area that was identified for further research. Existing programs that identify HTN in African-American teens demonstrated that nurses play a key role in the evaluation, development, treatment and clinical follow-up or interaction with patients and their families (Taylor, 2009). Further research utilizing these types of medical professionals may yield different training paradigms taught to different health care providers or medical professions, such as nurses and physicians. Both of these groups are trained in different ways and at different levels. Although this study did not examine nurses and the roles that they employ in the diagnosis and treatment of HTN in children and teens, current research stressed the importance of this health care provider group. Current research on familial or environmental influences on blood pressure in teens was recommended to determine the early risk for the development of HTN and to better understand the roles of nurses in the prevention and treatment of HTN in children and teens.

Another area of further research was white coat HTN in teens. As discussed earlier, white coat HTN was considered as an abnormally elevated blood pressure in a hospital or clinic with personnel wearing white coats (Jurko, Minarik, Jurko, & Tonhajzerova, 2016). It has also been discussed as elevated blood pressure in the hospital or clinic with normal blood pressure at home measured during the day by ambulatory blood pressure monitoring system (Chrysant, 2006). It was attributed to a stress response to the physician or nurse and was often associated with increased heart rate. According to some authors white coat HTN was present when the mean blood pressure values or readings that are within normal limits (Suurorg, 2003). False positive indicators, under-diagnosis and undiagnosed hypertensive children and teens can be the result of white coat HTN. Further research was warranted to determine if white coat HTN was altering the blood pressure diagnosis and reading in children and teens or resulting in misdiagnosis or no diagnosis. One author suggests that was has been reported that 47% in one study (Matsuoka, 2002) and 45% (Sorof & Portman, 2000) of children with HTN was the result of white coat HTN. Such high percentile readings warrant further investigation.

Lastly, further research can examine the descriptive statistics of HTN. This includes how to define what the blood pressure measurements and associated risk factors are, especially in undiagnosed children. In a study of African-American mothers and daughters with undiagnosed HBP, findings suggested that there was a relationship between lifestyle behaviors, body mass index and diet that could be statistically significant as well as familial influences (Taylor, 2009). The increases in the prevalence of pre-HTN and HTN were statistically significant for African-American and Hispanic children (Din-Dzietham, Liu, Bielo, & Shamsa, 2007). This disparate prevalence of HTN does not consider the health care providers' training or perceptions when treating asymptomatic African-American teens.

Implications for Positive Social Change

Social change may be defined as modification in ways of doing and thinking of people (Jensen, 2009). Social change refers to any significant change or alteration to behavior patterns or cultural values or norms or changes yielding profound social consequences (Anderson, 1983). A profound change has occurred in HTN which been at the forefront of known chronic diseases in the African-American community for decades; even as early as 1948. HBP in the African-American ethnic group was a public health problem (Paul &Ostfield, 1965; Boston University School of Medicine, 1948). Over those same decades, significant strides have been made to inform and educate this ethnic group on the management of HTN.

Change means that a large number of persons are engaging in activities that differ from those which they or their immediate forefathers engaged in some time before (Merrill &Eldredge, 1957). This was evidenced that change has occurred as seen in the 1948 Framingham Heart Studies which started September 1, 1948, with a last known update on May 1, 2015 (NHLBI, 2016). Social change based on this multigenerational study, designed to identify genetic and environmental factors influencing the development of cardiovascular and other diseases, has included children and teens, and has led a change in the culture and understanding of HTN.

Although most of the adverse outcomes of HTN occur in adulthood, there was now a more clear correlation and recognition of the relationship between childhood blood pressure and adult blood pressure. Social change has and will continue to occur by increasing the focus of health care providers; including pediatricians and general practitioners alike on detection of HTN (Bruyne &Walle, 2015).

The manner in which HTN was defined in children has changed over the last several decades, many times substantially (Vidal et al., 2012). The implication of what measurement was the gold standard continues to be a societal issue around the world across the globe. Perceived type of help that persons with chronic diseases receive may be considered as a force for social change by increasing the quality of patients' lives.

Understanding health care providers' experiences regarding the screening and protocols to diagnose teen HBP was important to assisting patients in the management and diagnosis of this chronic disease. If left undetected during the teenage years, HBP can morph into serious cardiovascular issues.

HTN in children and adolescents is a rising health concern that should be taken seriously and diagnosed early. Health care providers' perceptions of how to correctly diagnose, treat and manage pediatric HTN in teens enables early detection. Teens with HTN rarely have clinical evidence of the disease. The increased blood pressure was usually detected during a normal examination or before a physical examination for sports participation (Patel & Walker, 2016). Both health care providers and teens can be used to help improve communication on HTN to others in their peer group and to the society at large.

Everyone is needed to improve health care in whatever community needs it, to include, health care providers as well as those they provide health care to. One author shared that health care professionals must contribute to their skills wherever this is a need for them (Blackie, 2015). The four guiding principles, which can be used for positive social change is that we are to search for health needs, the stimulation of an health needs, the intention to influence policies affecting health; and enabling health-enhancing activities (Blackie, 2015).

I attempted to provide an assessment of the diagnosis and screening of asymptomatic HBP in African American teens from the health care providers' perspective. According to the results of the study, with the right standardized guidelines, training and high blood pressure equipment, the ability to correctly and consistently diagnose HBP in teens may be improved. Understanding and applying those national guidelines in a clinic or hospital setting is pivotal in screening for HBP. Practical recommendations focus on teen patients and diagnostic equipment. Teens are better informed about the causes of and treatments for HBP and are encouraged to seek assistance from community resources. Teens are also encouraged to exercise and adopt a healthier lifestyle. HBP equipment should be available at all times, at all clinical and hospital sites to accommodate the body style of all teens, i.e., larger blood pressure cuffs designed for children and teens to fit all height and weight classes. The results of this research can be used to develop and format the educational materials in a teen population.

Initially, the social change implications were to better tailor educational materials to help inform health care providers on the protocol to diagnose and screen for teen HBP. As an adult living with HTN, if I had been screened, identified and diagnosed as a teen, I may have been able to control my blood pressure and reverse the effects of a life long battle with this chronic disease. Adopting a healthier lifestyle to include more exercise and better food choices could have lowered my blood pressure without medication. The consequences of living with a lifetime of regret are outweighed by the need to provide a plethora of information to ensure that the African American teen population does not miss an opportunity to lower their blood pressure to a manageable level.

Educating health care providers and teens about the consequences of undetected HBP in the African-American community and the effects of improper screening can result in an absent diagnosis that affects this community. Over the last decades, researchers have sought to determine why the rise in teen HTN. The research on teen HTN indicates that under diagnosis could be a root cause (Cha, Chisolm, & Mahan, 2014).

Social change in public health focuses on the needs of the population with careful attention placed on those that serve that population. Public health policy includes all stakeholders; this includes the health care provider and the patient. This policy must not marginalize or stigmatize a potentially socioeconomically challenged population that can be different from the public health educators and policy makers (Hansen, Holmes, & Lindeman, 2013). Our society is democratic in nature. The stakeholders should provide those that serve and make decisions for any patient population with information so that they have the tools to make the best choices for their patients.

Social change implications are also for leaders in government, public health, and education. The responsibilities of federal, state, county, and community leaders in the prevention of HTN in children and teens continue to be vital to the health and well-being of patients and health care providers. Development of strategies and tactics to promote participation in the prevention of teen HTN by health care providers as well as health care systems including primary care, urgent care, emergency services, acute-care hospitals, rehabilitation hospitals, mental health inpatient and outpatient providers, educators, researchers, parents, and adolescents.

The most significant finding of this study uncovered the passionate attitude of health care providers to provide the best health care and treatment to their teen patients.

Conclusions

Investigating and comprehending qualitatively health care providers perceptions of screening and diagnosis in asymptomatic teen HTN in a African-American population may enable health professionals to better understand and help patients with chronic diseases in a more supportive and efficient way. In this study, I revealed that, according to the health care providers studied, diagnosis and screening of teen HTN was accomplished differently than adults who have HBP.

HTN training in children, screening guidelines used and the type of equipment used does play a significant role in the screening and diagnosis process. African American children may be larger than other ethnic groups and require different sized HBP cuffs based on their height and weight. These cuffs may not be available in clinical and hospital settings where the screening can occur. Equipping the health care providers with the needed tools, to include materials to present to an asymptomatic teen was used on a consistent basis. This may improve the early diagnosis of HBP at an earlier age and improve the quality of life of this population group.

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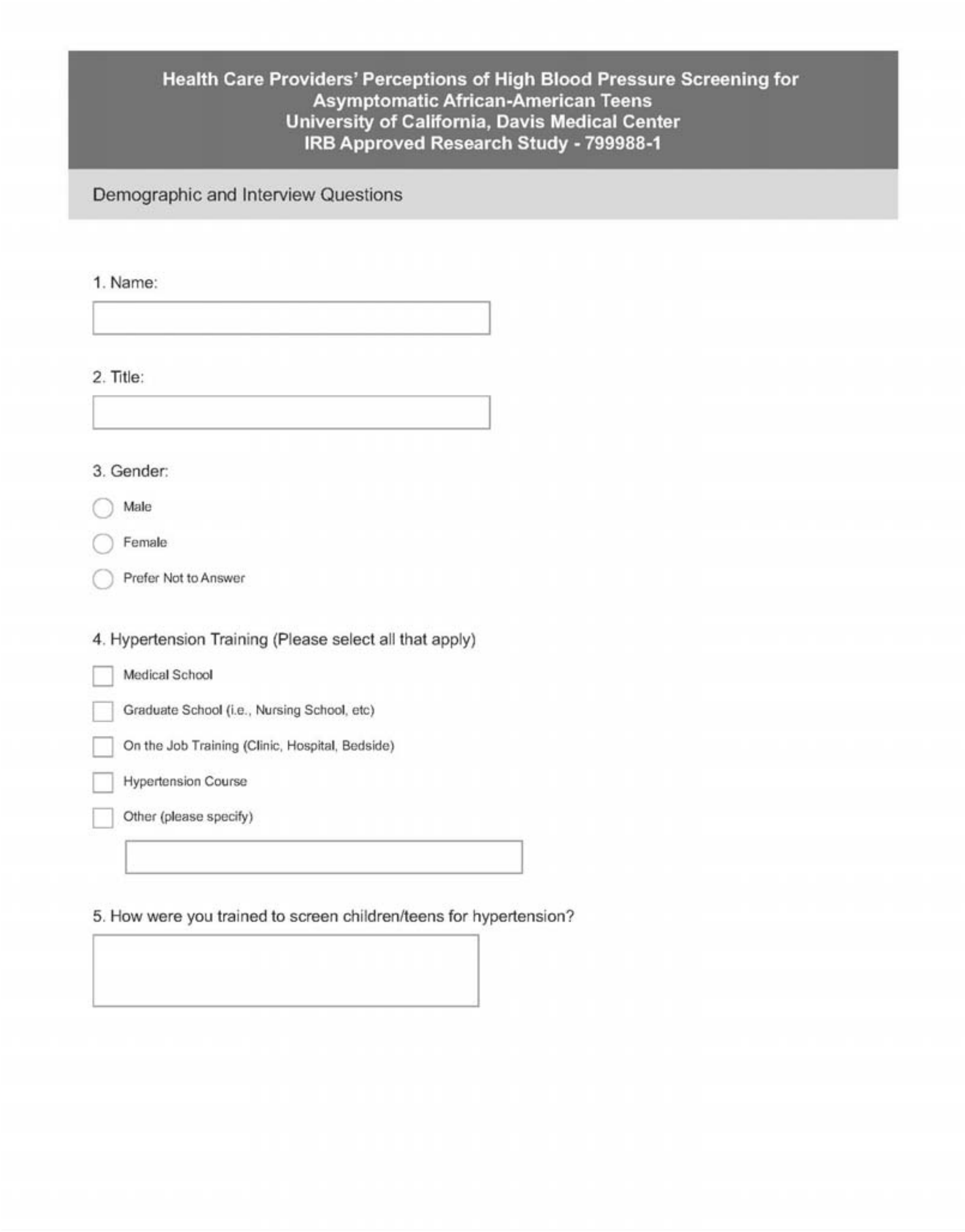
Appendix A: Qualitative Research Instrument



Health Care Providers' Perceptions of High Blood Pressure Screening for
Asymptomatic African-American Teens
University of California, Davis Medical Center
IRB Approved Research Study - 799988-1

Demographic and Interview Questions

1. Name:

2. Title:

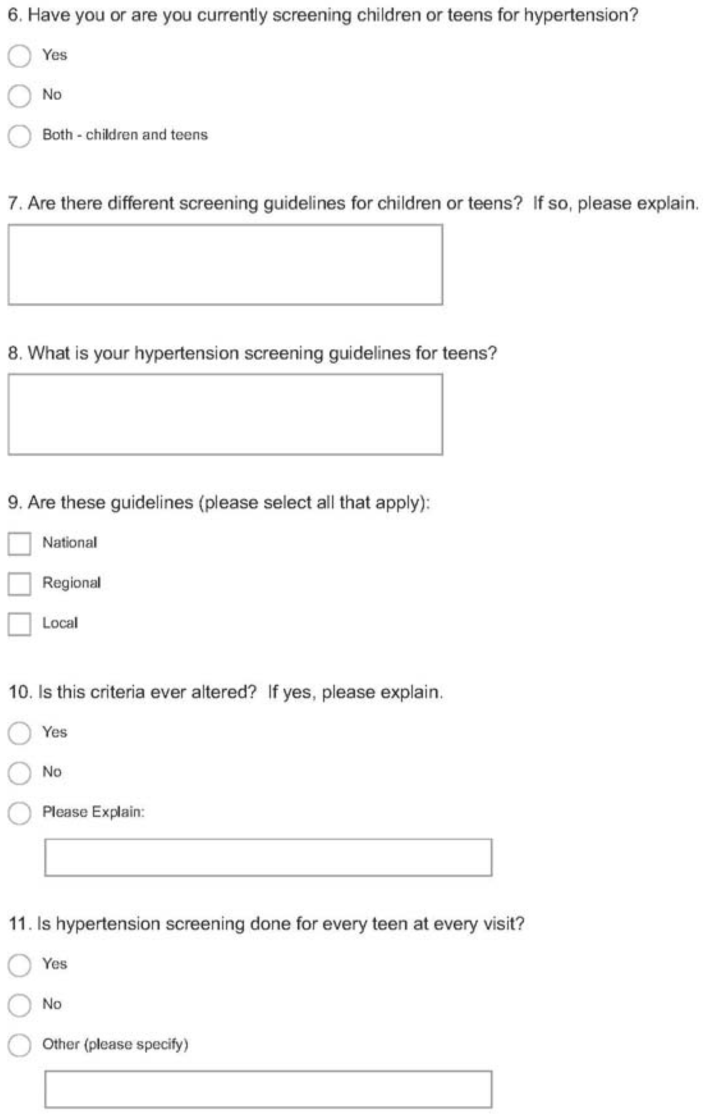
3. Gender:

○ Male
○ Female
○ Prefer Not to Answer

4. Hypertension Training (Please select all that apply)

☐ Medical School
☐ Graduate School (i.e., Nursing School, etc)
☐ On the Job Training (Clinic, Hospital, Bedside)
☐ Hypertension Course
☐ Other (please specify)

5. How were you trained to screen children/teens for hypertension?



6. Have you or are you currently screening children or teens for hypertension?

○ Yes

○ No

○ Both - children and teens

7. Are there different screening guidelines for children or teens? If so, please explain.

8. What is your hypertension screening guidelines for teens?

9. Are these guidelines (please select all that apply):

☐ National

☐ Regional

☐ Local

10. Is this criteria ever altered? If yes, please explain.

○ Yes

○ No

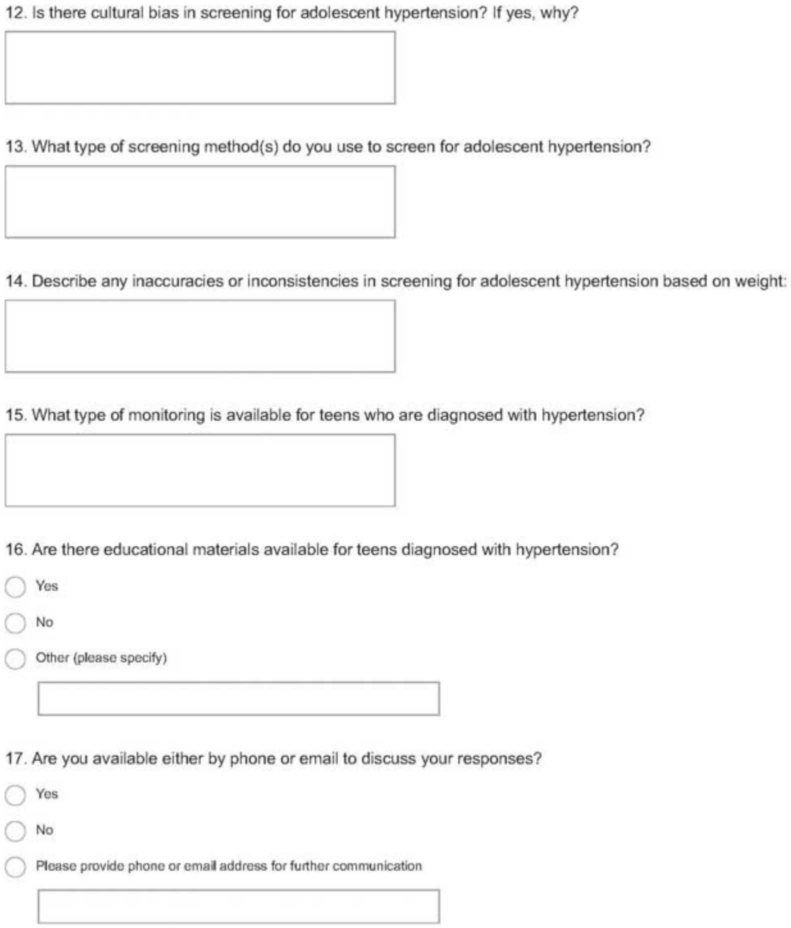
○ Please Explain:

11. Is hypertension screening done for every teen at every visit?

○ Yes

○ No

○ Other (please specify)



12. Is there cultural bias in screening for adolescent hypertension? If yes, why?

13. What type of screening method(s) do you use to screen for adolescent hypertension?

14. Describe any inaccuracies or inconsistencies in screening for adolescent hypertension based on weight:

15. What type of monitoring is available for teens who are diagnosed with hypertension?

16. Are there educational materials available for teens diagnosed with hypertension?

○ Yes

○ No

○ Other (please specify)

17. Are you available either by phone or email to discuss your responses?

○ Yes

○ No

○ Please provide phone or email address for further communication

Appendix B: Email Invitation

University of California, Davis Medical Center
To: Pediatric/Adolescent Medicine Personnel
From: Juanita Braxton – Student Researcher - UCDHS Employee

Hello!

I am contacting you regarding an IRB approved survey (IRB-Number 799988-1) being conducted as a Ph.D. student researcher here at the University of California, Davis Medical Center, School of Medicine. As an employee here, I am asking for your help with my dissertation study. You are invited to take part in a research study about "Health Care Providers' Perceptions of High Blood Pressure Screening for Asymptomatic African-American Teens".

The quick (less than 15-minute) survey asks medical personnel about their experiences diagnosing Hypertension in teens in general and in African-American teens specifically. Responses are completely anonymous; no personal identifiers are collected. Names of medical personnel will not be identified in any publications that might result from this work.

Participation in this survey is completely voluntary.

My research study will seek to understand the perceptions of health care providers surrounding the screening practices used to detect high blood pressure in asymptomatic teens and to understand from their perspective what screening tools they use to detect teen blood pressure based on their experience with the current screening methodologies. The researcher is inviting health care providers (which include physicians, physician assistants, nurses or screening personnel) who are qualified to deem a person (teenager) hypertensive to participate in the study. I believe that the data from this study might have an influence on future policies in diagnosing hypertension in children and teens.

I sincerely hope you agree to participate in this study for my dissertation.

If you are interested, please respond to this email indicating your interest. A hyperlink to my quick and anonymous survey along with additional information will then be provided to you to complete at your earliest convenience. Additionally, if you are not interested, please let me know and I will avoid further solicitation.

If you have any questions, please feel free to contact me via email or through my direct line of 916-734-XXX.