



## Targeting Childhood Obesity and Cardiovascular Health

Jasmine Barber\* and Diane Barber

Division of Nursing, Winston Salem State University, USA

\*Corresponding author: Dr. Barber Jasmine L DNP, APRN, FNP-BC, Division of Nursing, Winston Salem State University, USA, Tel: +123 345 567; Email: barberjl@wssu.edu

Received Date: August 26, 2019; Published Date: September 27, 2019

### Abstract

**Background:** Pediatric obesity and cardiovascular diseases are conditions which remain problematic globally. The continued increase of both diseases extends beyond pediatric years adding health risks into adulthood. Both conditions can be positively impacted by lifestyle and behavior modifications gained through effective patient education. Nationally the childhood obesity rate continues to climb. Healthy People 2020 includes obesity and cardiovascular disease as health initiatives in the pediatric population. The pediatric population residing in some Southeastern states have a rate of obesity greater than 20% exceeding rates of other regions.

**Purpose:** The purpose of the quality improvement project was to improve the practice approach to include health initiatives consistent with Health People 2020. A multidisciplinary treatment team implemented the CVD guidelines with each patient visit and an electronic health record (EHR) flagged elevated blood pressure readings at the wellness center. Methods: The study design utilized a descriptive, prospective, and retrospective study approach by electronic health record (EHR) chart review. Wellness center charts were randomly audited by the author showed the CVD guidelines and system flags. Author created checklists to evaluate consistency in care and addressed or unaddressed elevated blood pressure readings.

**Results:** Forty two of forty-eight charts showed care was provided based on clinical practice guideline implemented. No patients had an elevated blood pressure reading during the 8-week project period. Conclusion: Implementing CVD guideline proved instrumental in providing consistency in care among providers with the use of an evidenced-based approach in care of hypertension and provided an opportunity to educate providers and to ensure future congruency in care. The practice change aided in the determination and commitment of the providers and staff to remain firm in the mission of targeting the pediatric obesity epidemic within wellness center.

**Keywords:** Pediatric Obesity; Cardiovascular Diseases; Behavior; Cardiovascular Health

**Abbreviations:** PI: Principal Investigator; EHR: Electronic Health Record; CVH: Cardiovascular Health; CVD: Cardiovascular Disease; QNC: Quality of Nursing Care.

### Introduction

In the early 2000s, the rates of obesity and cardiovascular disease (CVD) in children were steadily climbing in the United States. More recent years have shown these rates to stagnate, but they still remain prevalent. In light of

these developments, Healthy People 2020, released by the Department of Health and Human Services, lists the reduction of both CVD and obesity as health initiatives for the pediatric population (Department of Health and Human Services, 2010). In the United States, among a sample of 5 to 17-year olds, 70% of obese youth were noted to have at least one risk factor for CVD. Prevention and treatment of related chronic disease is instrumental in decreasing pediatric obesity [1].

## Background

Despite numerous initiatives and programs to target pediatric obesity, pediatric obesity and CVD rates are increasing in both undeveloped and developed countries [2]. The prevalence of worldwide obesity increased in 2013 in developed countries from 8.1% (7.7%–8.6%) to 12.9% (12.3%–13.5%) for boys and from 8.4% (8.1%–8.8%) to 13.4% (13.0%–13.9%) for girls [3]. In the United States, the childhood obesity rate doubled for ages 6 to 11 and tripled for adolescents aged 12 to 19 in the past 30 years [4]. The increasing rate of obesity has leveled over the past 10 years, except among African American girls and Hispanic boys [5].

The statistics for comorbid conditions such as obesity and overweight were elevated for one southeastern state, North Carolina, at 55% and 54.5%, respectively. These comorbid conditions attribute to the state ranking 35th out of 50, as calculated by the North Carolina Department of Health and Human Services' (NCDHHS) quality indicators for height and weight in 2005 (NCDHHS BRFF, 2012). The obesity rate for the southeastern state in 2009 was 29.5%, and the overall health index for the state was ranked 33rd when compared to the other 50 states.

Former First Lady Michelle Obama helped draw nationwide attention to the significance of pediatric obesity by forming a platform targeted at reducing childhood obesity. The Let's Move campaign, adopted by Mrs. Obama, encouraged and supported Americans, especially children, to become healthier by reducing or maintaining an acceptable BMI through diet and exercise [2]. According to the Behavioral Risk Factor Surveillance System, the South has the highest prevalence of overall obesity in the country. To help address this issue in one North Carolina city, the Mayor's Educational Childhood Obesity Prevention Program was developed [6]. The program uses an interactive website to teach 7 to 10-year olds about healthy food choices, basic exercise, and nutrition.

Although pediatric obesity is being addressed in this city, the conditions that can develop secondary to obesity,

including CVD, must also be addressed [7]. In a sample of 5 to 17-year olds in the United States, 70% of obese youth were noted to have at least one risk factor for CVD [4]. If unresolved, obesity and chronic cardiovascular conditions can continue into adulthood and may lead to premature death [8]. The increasing prevalence of CVD in the pediatric population stresses the importance of improving care for children with this disease. According to Lurbe [9], blood pressure readings are now standard in pediatric office visits due to the rising prevalence of hypertension (high blood pressure) in children. Evidence suggests prevention and behavior modifications as key factors in targeting obesity occurrence as a secondary condition [10]. Some researchers have contended that discrepancies in office practice documentation of ambulatory blood pressure in adolescents can be a hindrance to care [9,11]. Missing the opportunity to catch slightly elevated blood pressure readings can delay the diagnosis of prehypertension, hypertension, and CVD [12]. Researchers have suggested that finding CVD earlier in life and managing it appropriately led to better adult health [13].

In many instances, with proper education and preventive care, both CVD and obesity may be avoided and/or well maintained. It is imperative that better management and prevention occur in the pediatric population to reduce the likelihood of predisposing the youth to chronic diseases and health concerns in adulthood [1,14].

## Aim

The project aim was to report the introduction and implementation of an established clinical practice guideline to improve care of obesity and resultant hypertension of pediatric clients of a pediatric wellness center located in North Carolina, as well as evaluate their outcomes. The practice is a growing, newly opened, privately owned establishment with a driving mission to target disparities and pediatric obesity in the community.

## Concepts of the Project

### Hypertension (High Blood Pressure)

**Theoretical definition/Operational definition:** The American Academy of Pediatrics' (AAP) CVD guidelines defined elevated or high blood pressure as systolic and diastolic blood pressure readings > 90<sup>th</sup> or 120/80mmHG < 95<sup>th</sup> percentile or whichever is lower.

### Obesity

According to Schwarz [15], no universal operational definition has been adopted due to the challenges of

obtaining data to support the relationship between adult morbidity and mortality secondary to childhood weight.

### Theoretical definition

The American Diabetes Association (2010) defined obesity as having a basal metabolic index of 30 or greater. As defined by the American Diabetes Association, obesity is a condition in which a greater-than-normal amount of fat is in the body: a condition more severe than being overweight. BMI is calculated based upon a person's weight and height and provides a reasonable indicator of body fat and recognition of weight categories that may lead to health problems.

### Operational definition

The definition of obesity for the purposes of the practice change project is having a BMI of 30 or greater as recorded in the client's clinical record.

### Evidence-based theoretical change model

Larrabee's [16] practice change model, quality of nursing care (QNC) theory, assisted in determining and guiding the need for proposed changes. The steps in Larrabee's QNC theory are as follows: Steps

- a. Assess the need for change in practice.
- b. Locate the best evidence.
- c. Critically analyze the evidence.
- d. Design practice change.
- e. Implement and evaluate change in practice.
- f. Integrate and maintain change in practice [17].

The determination included a comparison of internal operations and data at the wellness center to that of external practices. Determining the level of need included brainstorming and collaborating with the medical director. The QNC model prevented deviation from the ultimate goal of implementing change and measuring outcomes as each step of the practice change was used.

### Setting

The quality improvement project was implemented in a recently established pediatric wellness center, which was open 3 days a week for 3 to 4 hr and was seeing, on average, three patients per day. The health care team consisted of the medical director, a family nurse practitioner, the author/provider, a receptionist, and an office manager. The team collaborated to facilitate the improvement of the quality of life and wellness of patients through patient education and monitoring.

### Sample

The sample comprises a diverse population; the majority of the patient population were Hispanic or African American families. The medical director and practice owner questioned the consistency of addressing elevated blood pressure readings and consistency in care among providers. The literature supports the use of clinical practice guidelines to aid congruency in care, which can be instrumental in significantly improving the quality of care delivered to patients and families [18].

### Methods

The study design utilized a descriptive, prospective, and retrospective study approach by electronic health record (EHR) chart review. Prospectively, the providers monitored the EHR for any occurrences of elevated blood pressure. And retrospectively, 5 weeks after the 8-week prospective study period, the author conducted an EHR chart audit to evaluate the accuracy and functioning of the EHR system. The treatment guidelines implemented was selected by the practice founder and the author. These guidelines come from the AAP, specifically the Expert Panel of Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents [19]. The guidelines were specifically for children between the ages of 3 and 19 years and a BMI greater than the 85<sup>th</sup> percentile of pediatric standard growth measures.

The quality improvement project was approved by the Rocky Mountain University of Health Professions' Institutional Review Board, and a letter of support for the project from the practice's medical director was received. The AAP guidelines were introduced to the wellness center's staff and providers, and the providers were informed of future practice expectations. Implementing the AAP CVD clinical practice guidelines to aid in the management of obese and hypertensive patients also enhanced treatment consistency. This incremental practice change ensured that all providers in the practice were using the most recent evidence-based practice as they followed the AAP CVD guidelines [20].

The medical director encouraged and supported the practice change and believed that implementing the proposed changes at the time was forward thinking for potential mandates, which may occur in the future. The medical director wished to ensure that all patients involved in the program and wellness center receive improved care. The wellness center practice was ready for the imposed changes to be implemented as the proposed systems were being oriented to all employees. The newness of the practice increased the efficacy of the system change due to a spirit of cohesiveness and

decreased staff resistance as routines were not yet formulated at the time of implementation. Staff orientation to the EHR was ongoing; staff had to learn how to maximize its capabilities. All improvements may help grow the practice (i.e., increase patient numbers).

Champions for the imposed changes were the medical director and the author/provider. They monitored the progress of change and were resources for any questions or concerns that arose. The stakeholders for this project were the medical director, family nurse practitioner, patients, patients' families, and community. All providers and staff at the practice were incorporated into the change by active involvement in the care and management of the patients. The providers managed the patients' education and provided guidance to make necessary changes to decrease cardiovascular risk and perpetuation of pediatric obesity through adulthood.

As mentioned previously, Acosta [11] noted that discrepancies in office practice documentation of ambulatory blood pressure in adolescents can be a hindrance to care. Researchers have suggested that diagnosing CVD early in life and managing it appropriately leads to better adult health [21]. Missing the opportunity to catch slightly elevated blood pressure readings can result in later diagnosis of prehypertension, hypertension, and CVD [12].

Blood pressure parameters were determined by the Center for Disease Control's (CDC) standardized growth charts. When the AAP CVD guidelines were introduced to the wellness center staff and providers, the supporting staff was made aware of segments of the guidelines that were pertinent to implementing system flags, specifically blood pressure measurements [19].

A question-and-answer session was held to address the EHR change, concerns and questions regarding the implementation process, as well as guidelines and expectations of the practice founder. Once the guideline was implemented, the practice's software company was contacted about incorporating system flags for elevated blood pressure readings into the system. The company created a prompt, or a window that popped up when each provider logged into the system.

When an elevated blood pressure reading was obtained and entered by the certified medical assistant into the EHR, a window popped up with a message to any provider who opened the patient's EHR chart. The message prompted providers to note the elevated blood pressure reading in the previous visit. The messages not only informed the provider of the previous elevated reading

but also reminded them to recheck the blood pressure value for the current visit. As the provider's attention is brought to the elevated blood pressure reading, they are triggered to follow the AAP CVD guidelines, which provided patient education on how to prevent the development of hypertension and CVD.

### Analysis

The analysis of the findings will be completed using measures of central tendency: percentages, frequency, mean, and mode.

### Results

During implementation of the AAP CVD guidelines, each provider monitored the EHR to look at each occurrence of the programmed popup that alerted the provider of an elevated blood pressure. Each occurrence was counted as one. Upon completion of the 8-week project, the results were analyzed using checklists designed by the author. No patients had an elevated blood pressure reading during the 8-week project period. Though no elevated blood pressure readings occurred during the project period, system flags were accepted and incorporated into the EHR to be continuously used to alert providers to elevated blood pressure. The providers were comfortable with the popup window and considered it beneficial to treatment. Buy-in by providers and support staff was achieved by openly sharing the intent of the changes and why they would continue to be beneficial and positive.

The EHR consumed very little of the overhead cost for the wellness center. The software vendor charged a fee of \$30 to add each provider who used the EHR for the EHR charting system. No charge was assessed for the supporting staff or the author. Once the system flags and clinical practice guideline were implemented, the author and practice founder calculated the savings from managing and treating pediatrics clients in this way. They determined that the changes helped prevented the need for treatment of hypertension and CVD over a lifetime and thus resulted in indirect savings.

After the system flags were incorporated into the EHR, the author completed chart audits to evaluate the success of the practice change. This was performed by the creation of a checklist which asked if the guideline was followed for each patient encounter or not. These chart audits were added to the checklist. The audits determined whether the providers followed the clinical practice guideline and whether they addressed the elevated blood pressure readings.

The charts were audited on separate days over 1 week. Forty-eight charts were reviewed, and it was concluded that 42 (87.5%) of the total patient visits were guided by the clinical practice guidelines for managing and treating obesity. The providers used an appropriate treatment for obesity and patient education based on the recommendations outlined in the guidelines. The results showed that providers accepted and embraced the practice change.

After implementation, the team members documented anthropometric measures (i.e., blood pressure, height, and weight) then calculated BMI and guided patients toward BMI goals and progressive health outcomes. No patients who were seen during the project window presented with elevated blood pressure readings. Though no elevated blood pressure readings occurred during the project period, the system flags that were incorporated into the EHR will be used when the need arises. The providers and supporting staff members modified their routines to include time for patient education and counseling during appointments. The change improved continuity of care among the providers. Implementation of the guidelines improved the providers' adherence to the AAP's standards of care, which ultimately should improve quality of life for both the patients and their families.

The system change addressed two of the Healthy People 2020 (2018) initiatives: CVD and obesity [13].

### Limitations

The wellness center, on average, saw three patients per day, a cause of which may be due to a significant number of no-show appointments. An unintended consequence of the decreased volume was having no elevated blood pressure readings during the implementation period. As a result of this limitation, the system flags could not be evaluated. Though the impact of the system could not be evaluated during the implementation phase, it will nevertheless aid in capturing future elevated blood pressure readings.

### Discussion

The principal goal of the project was to implement a clinical practice guideline to establish consistency in care among providers. An additional goal was to determine the frequency of unaddressed elevated blood pressure readings in the pediatric clinic setting. The changes implemented would significantly impact future care delivered in the wellness center by offering consistent screening for hypertension with system flags and

congruent care. The two incremental changes may have a profound impact on the success of the practice's growth. The incorporated changes to the practice had an impact on overall patient care and ultimately the patients' quality and quantity of life.

Implementing the AAP CVD clinical practice guidelines and adding a flagging system to denote elevated blood pressures aided in improved care. Incorporation of the AAP CVD guidelines in the treatment of each patient at the pediatric wellness center ensured consistent application of evidence-based care. The project encouraged more efficient communication between the principal investigator, staff, medical director/practice founder, and providers. The staff learned more features of the current EHR system and how to use it more efficiently for patient care. They were able to see its significance in consistency in patient care. In addition, the project, which will continue at the wellness center, will ultimately help reduce the rate of childhood obesity and CVD by using the most recent evidence-based care.

Lastly, the sustainability of this project is encouraging. The practice founder is highly motivated and encouraged to make an impact on childhood obesity and cardiovascular health. Considering those intentions, the practice founder is taking great care and consideration in running the wellness center in a manner that will carry on even after her departure to another facility. The changes that were incorporated into this practice will hopefully be implemented in future wellness centers. Due to the successful changes incorporated into this facility, future wellness centers that are opened by this medical director/practice founder will be structured similarly. It was the practice founder's intent to open multiple pediatric and adolescent wellness centers in multiple states; therefore, the patients in these future wellness centers will be impacted by these incremental changes. Though the changes being implemented were incremental in the practice, they may become more significant in the success and growth of the practice once other wellness centers are opened. The changes initially focused on the health and well-being of one community, but they may help improve nationwide rates as well as assist one child at a time. The overall health and quality of life of the patients and community will be indirectly affected by the center using quality evidence-based care [12].

The project was successful in that clinical practice guidelines were implemented and used by the providers to guide treatment. Consistent adherence to the AAP CVD guidelines were apparent once the chart audits were completed. Each patient received care according to the guidelines. Modification of the system to incorporate

system flags for elevated blood pressure readings was beneficial to patient care and the success of the practice, even though no patients presented with blood pressure elevation during the project. The changes incorporated by the project will continue to benefit both the patients' health and the growth of the practice for years to come.

## Conclusion

In conclusion, the implementation of clinical practice guidelines can positively influence care in practice. This not only offers a standard for care but aids in consistency among providers. The practice change implemented significantly improved quality of care for the pediatric patient population, thus aiding in addressing pediatric obesity. Sustaining the changes implemented will continue to address not only pediatric obesity but also hypertension and cardiovascular health in the practice population and community.

## References

- Dietz WH, Solomon LS, Pronk N, Ziegenhorn SK, Standish M, et al. (2015) An integrated framework for the prevention and treatment of obesity and its related chronic diseases. *Health Aff* 34(9) 1456-1463.
- Branham M (2010) *Capital Ideas*.
- Ng M, Fleming T, Robinson M, (2014) Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 384(9945): 766-781.
- Freedman DS, Zuguo M, Srinivasan SR, Berenson GS, Dietz WH (2007) Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. *J Pediatr* 150(1): 12-17.
- U.S. Preventive Services Task Force (2017) Screening for obesity in children and adolescents: US Preventive Services Task Force recommendation statement. *JAMA* 317(23): 2417-2426.
- City of Winston-Salem (2012) Retrieved from [cityofws.org](http://cityofws.org).
- Cruz ML, Shaibi GQ, Weigensberg MJ, Spruijt-Metz D, Goran MI, et al. (2005) Pediatric Obesity and Insulin Resistance: Chronic Disease Risk and Implications for Treatment and Prevention Beyond Body Weight Modification. *Annu Rev of Nutr* 25: 435-468.
- Lee WW (2007) An overview of pediatric obesity. *Pediatr Diabetes* 8 suppl 9: 76-87.
- Lurbe E, Redon J (2007) Discrepancies in office and ambulatory blood pressures in adolescents: helper or hindrance? *Pediatric Nephrology* 23: 341-345.
- Wilfey D, Staiano A, Altman M, Lindros J, Lima A, et al. (2017) Improving Access and Systems of Care for Evidence-Based Childhood Obesity Treatment: Conference Key Findings and Next Steps. *Obesity* 25(1): 16-29.
- Acosta AA, McNiece KL (2008) Ambulatory blood pressure monitoring: a versatile tool for evaluating and managing hypertension in children. *Pediatr Nephrol* 23(9): 1399-1408.
- Salvadori MS (2008) Elevated Blood pressure in Relation to Overweight and Obesity Among Children in a Rural Canadian Community. *Pediatrics* 122(4): 821-827.
- Healthy People 2020 (2018).
- Morrison J, Glueck C, Woo J (2012) Risk factors for cardiovascular disease and type 2 diabetes retained from childhood to adulthood predict adult outcomes: The Princeton LRC Follow-up Study. *International Journal of Pediatric Endocrinology* 2012(1): 6.
- Schwarz S (2019) How is obesity in children defined? *Medscape*.
- Larrabee J (2009) *Nurse to nurse evidence-based practice*. New York, NY: McGraw Hill.
- Melnyk BM, Fineout-Overholt E (2015) *Evidence-based practice in nursing and healthcare*. New York, NY Wolters Kluwer. P259.
- Matson KL (2012) Treatment of Obesity in Children and Adolescents. *J Pediatr Pharmacol Ther* 17(1): 45-57.
- Brady TM, Neu AM, Miller ER, Appel LJ, Siberry GK, et al. (2015) Real-time electronic medical record alerts increase high blood pressure recognition in children. *Clin Pediatr* 54(7): 667-675.
- Hughes AR, Reilly JJ (2008) Disease management programs targeting obesity in children - Setting the scene for wellness in the future. *Disease Management and Health Outcomes* 16(4): 255-266.

21. Larsen L, Mansleco B, Williams M, Tiedeman M (2006) Childhood obesity: Prevention practices of nurse practitioners. *J Am Acad Nurs Pract* 18(2): 70-79.