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INCORPORATING WAIST CIRCUMFERENCE SCREENINGS TO INITIATE PREVENTATIVE LIFESTYLE MODIFICATION EDUCATION: A FEASIBILITY STUDY FOR A CLINICAL PRACTICE CHANGE

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An Abstract of the Scholarly Project by
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The purpose of this study was to evaluate provider perceptions and willingness to incorporate adult gender-specific waist circumference screenings as a clinical practice change. The project was conducted at the 4-State Advanced Practice Nurses (APN) conference in March 2018. The study consisted of a two-part study that utilized a pretest, educational PowerPoint presentation, posttest, and eight-week posttest to determine self-reported provider practices. Part one of the study analyzed the pretest and posttest to evaluate whether there was an increase in the providers' knowledge of BMI and gender-specific waist circumference parameters. Part two of the study analyzed the pretest and eight-week posttest to determine current practices and whether there was a change in the self-reported provider practices to incorporate waist circumferences screenings. The project evaluated the providers' current practices of diagnosing overweight and obese patients, determined the providers' awareness of gender-specific waist circumferences increasing risk for developing weight-related comorbidities, and determined if the provider increased preventative lifestyle modification education following the educational presentation. The conclusion of the study revealed an increase in the providers' knowledge of BMI parameters and an increase in knowledge of gender-specific waist circumferences but did not identify a change in provider practices to incorporate waist circumference screenings as a clinical practice change.

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Chapter I

Introduction

"If most of your fat is around your waist, you're at a higher risk for heart disease and type 2 diabetes. This risk goes up with a waist size that is greater than 35 inches for women or greater than 40 inches for men" (NIH, 2017)

According to the World Health Organization (WHO, 2017), obesity is a global epidemic that predisposes patients to the development of numerous chronic comorbidities worldwide. Body mass index (BMI) is the universal measurement tool to diagnose obesity in adults (NIH, 2017). The National Institutes of Health (NIH) defines overweight as a BMI of 25 or greater and obesity as a BMI of 30 or greater. BMI is limited to age, height, and weight calculations and does not take into account the differentiation between visceral adipose tissue and subcutaneous adipose tissue (Maclnnis et al., 2013). Visceral adipose tissue is the adipose tissue surrounding the abdomen and abdominal organs which is commonly referred to as central obesity, while subcutaneous adipose tissue is the adipose tissue located under the skin (Maclnnis et al., 2013). Numerous comorbidities are associated with obesity with the greatest risk factor being associated with increased visceral adipose tissue or central obesity (Maclnnis et al., 2013).

According to numerous studies, the location of the adipose tissue in and around the abdomen has a direct contribution to the development of diabetes (Forte et al., 2012; Wander et al., 2013). The visceral adipose tissue located around the abdomen and

abdominal organs is associated with a predisposition to advanced weight-related comorbidities (Maclnnis et al., 2013). As adipose accumulates around the abdominal organs, the body is unable to effectively metabolize insulin leading to insulin resistance (Mallory, Angosta, & Kawi, 2014; Misra & Vikram, 2003). Insulin resistance is a metabolic predisposition where the body produces adequate insulin, but the body is unable to utilize the insulin to allow glucose to enter the cell (Mallory et al., 2014; Misra & Vikram, 2003). As the blood glucose increases, the pancreas attempts to compensate by increasing insulin production (Mallory et al.; Misra & Vikram, 2003). With increased blood glucose and insulin levels, the patient has a predisposition to the development of diabetes (Mallory et al., 2014; Misra & Vikram, 2003). Similarly, the effects of visceral adipose tissue predisposes patients to additional comorbidities such as hypertension, dyslipidemia, and certain types of cancers (Forte et al., 2012).

The American Heart Association (AHA) (2016) classifies 70% of all Americans as overweight or obese. Few practitioners address increased visceral adipose tissue as a need for preventative education (AHA, 2016). Awareness of this correlation provides an opportunity for providers to intervene and educate patients in the family care practice setting (Wadden et al., 2013). Evidence-based research identifies an increasing association that can necessitate a practice change to incorporate assessing the abdominal girth with vital signs during office visits as a practice quality improvement.

Statement of the Clinical Problem

As the aging process unfolds, the proportion of muscle mass decreases while the proportion of adipose tissue increases (Misra & Vikram, 2003). There is a tendency for adipose tissue to accumulate in and around the abdomen. With advancing age of the male

gender, the focal location for distribution of adipose tissue is specific to the abdominal region (Kravitz, 2010). With advancing age of the female gender, the focal location for distribution of adipose tissue is more generalized but is also predominantly focused to the abdominal region and hips (Kravitz, 2010). This predisposition of adipose tissue is multifactorial. The aging process, genetics, lifestyle, and metabolic changes contribute to the development of visceral or central obesity (Maclnnis, 2013). With progression of age, the multifactorial effects of the development of central obesity begins to become apparent. Currently, there are no existing practice guidelines that direct practitioners to measure abdominal girth size during primary care office visits. Given the absence of abdominal measurement assessment tools, there is an identified need to institute a practice change to identify patients with visceral adipose tissue or central obesity in the primary care setting.

The exact measurement of visceral adipose tissue would require a Magnetic Resonance Imaging (MRI) or computed tomography (CT) to identify the presence of visceral adipose tissue surrounding the abdomen and internal organs (Min & Stephens, 2015). Anthropometric measurements are a substitute for the definitive identification of adipose tissue by an MRI (Min & Stephens, 2015). Anthropometric measurements of regional obesity consist of waist circumference (WC), hip-to-waist ratio (HWR), waist-to-height ratio (WHR) and skin fold measurements (Limpawattana, Kenfkijkosol, Assantachai, Krairit, & Pimporm, 2014). The goal of this project is to focus on the inclusion of the anthropometric measurement of WC in the adult population in the primary care setting. Women who have a waist circumference of >35 inches, or 88 cm, and men who have a waist circumference of >40 inches, or 102 cm, are identified as

predisposed or at risk for the development of diabetes (NIH, 2017). The anatomical location for measurement is between the lowest rib and iliac crest (NIH, 2017). A preventative measurement tool for the identification and intervention of central obesity is necessary to prevent the advancement of associated weight-related comorbidities.

The WHO (2017) classifies obesity according to body mass index (BMI). BMI provides the most useful measurement for the diagnosis of overweight and obese patients, but it is considered to be a rough guide due to variations in the distribution of adipose tissue (WHO, 2017). Although BMI is the gold standard for the diagnosis of overweight and obesity, it does not take into account the dissemination of visceral adipose tissue in comparison to subcutaneous adipose tissue (Maclnnis et al., 2013). Increased visceral adipose tissue correlates with insulin resistance leading to the increased risk of the development of non-insulin type II diabetes (Maclnnis et al., 2013). Therefore, it is necessary to consider utilizing an abdominal girth measurement tool to identify patients who are at risk, so the provider can initiate education to prevent the potential advanced weight-related comorbidities of central obesity (Maclnnis et al., 2013). A preventative approach to addressing increased abdominal girth is necessary to change the anticipated trend and redirect the culmination of current lifestyle behaviors to increase the patient's health status and improve their quality of life. It is the goal of this DNP scholarly project to develop a measurement tool to be utilized in a pilot study to identify the need for a practice change to incorporate waist circumference screenings as a practice change.

Significance to Nursing

Adult obesity is a chronic, preventable disease which can progress to the advancement of weight-related comorbidities (Min & Stephens, 2015). According to the

WHO, obesity has almost tripled worldwide since 1975. Approximately two-thirds of Americans meet the criteria to be defined as overweight or obese (Costa et al., 2016). The estimated medical expenses for obesity in the United States is $147 billion annually, and rising (McHugh, 2016).

Obesity is currently a preventable worldwide epidemic that progressively continues to lead to advanced weight-related comorbidities (Costa et al., 2016). Trending BMI values are common practices in the primary care setting, but addressing the evolution of visceral obesity is not a common practice. In addition, it is also not a common practice to measure abdominal girth at a routine visit (Volger, 2013). Central obesity is a precursor to numerous weight-related comorbidities (Min & Stephens, 2016). As the abdominal girth measurement increases, there is an increased risk for the development of advanced weight-related comorbidities (Min & Stephens, 2016). It is necessary for the practitioner to broach the topic of obesity through lifestyle modifications to prevent the associated weight-related comorbidities (Robinson, Keyes, Martin, & Yang, 2013).

Purpose of the Project

The purpose of this scholarly project is to identify provider perceptions and attitudes toward addressing obesity and determine the provider's feasibility to incorporate waist circumference screenings into clinical practice. The project will consist of developing a retractable tape measure, referred to as the abdominal girth measurement tool (AGMT), and pilot the application of the tool with the participants of the 4-State Advanced Practice Nursing (APN) conference to determine the feasibility of incorporating waist circumference screenings as a practice change in the primary care

setting. BMI remains the gold standard for the diagnosis of obesity. However, the purpose of this project will build upon the current practice guidelines and pilot the AGMT based on current evidence-based practice (Booth, Prevost, Wright, & Gulliford, 2014; Kozica et al., 2015).

The foundation of this project is for nurse practitioners to identify visceral or central obesity using waist circumference screenings as a springboard to initiate lifestyle modification education of diet and exercise to prevent the insidious development of advanced weight-related comorbidities. An educational presentation for nurse practitioners is scheduled to be presented to nurse practitioners attending the 4-State APN conference on March 3, 2018. Questionnaires will be presented before, after, and eight weeks following the presentation. This is a pilot study to determine provider attitudes for waist circumference screenings to determine the feasibility for further practice trials.

Conceptual Framework

The Theory of Planned Behavior (TPB) by Icek Ajzen (1991) is the conceptual model utilized to correlate the implementation of the into clinical practice. The concepts of key variables are normative beliefs, subjective norms, control beliefs, perceived behavioral control, behavioral intension, and behavior (Ajzen, 1991). Conceptual or operational comparisons are identified with perceived behavioral control with self-efficacy and attitudes toward behavior with outcome expectancy (Ajzen, 1991). Social influence consists of the social networks of peer groups, workplace, and family to influence the behavioral change (Ajzen, 1991).

The TPB conceptual model is utilized to correlate the implementation waist circumference screenings into clinical practice. This theory reaches to connect beliefs

with actions or behaviors (Ajzen, 1991). Application of the theory suggests that a provider's attitude toward inclusion of waist circumference screenings, provider's subjective norms, and perceived behavioral control over the patient's outcome collectively shapes the provider's behavioral intention or motivation to implement waist circumference screenings (Ajzen, 1991). Perceived behavioral control of the provider is an extension of self-efficacy, and the provider will accomplish self-efficacy as anticipated outcomes are successfully obtained (Ajzen, 1991). Self-efficacy is a necessary precondition for the behavioral change (Ajzen, 1991). It is linked to control beliefs that could facilitate or impede the implementation of waist circumference screenings. A provider's intention can be determined by the attitudes that they have toward obesity. The goal of the theory proposes that the provider's intentions will correlate with the provider's observed actions.

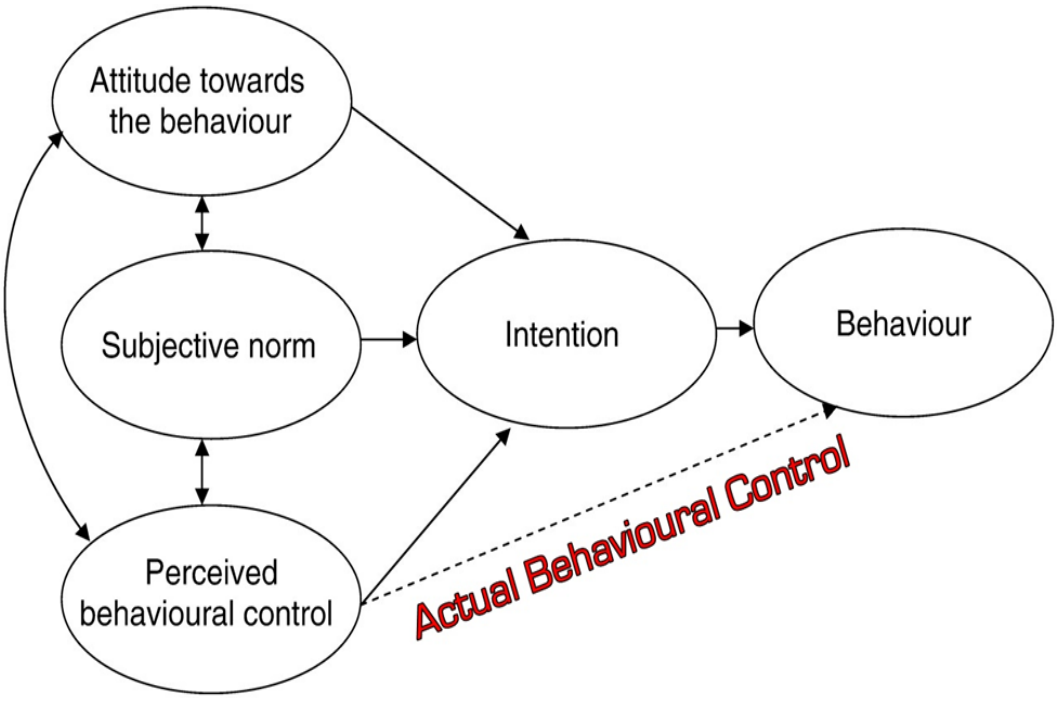

Figure 1. Theory of Planned Behavior (Ajzen, 1991)

Research Questions

1. Will the educational presentation increase the nurse practitioner's accuracy of diagnosing overweight and obese patients?
2. Will nurse practitioners' perceptions for addressing obesity improve after incorporating the abdominal girth measurement tool (AGMT)?
3. Will nurse practitioners self-report that the 4-State Advanced Practice Nursing (APN) conference education increased the diagnosis of overweight and obese adult patients in their primary care clinic?
4. Will the educational presentation increase nurse practitioner knowledge of gender-specific waist circumference measurements that increase the risk for the development of comorbidities in adults between 20-65 years of age?
5. Will nurse practitioners have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks after the presentation of education at the 4-State APN conference?

Definitions of Key Terms/Variables

Abdominal girth measurement tool - retractable tape measure with preprinted gender-specific parameters to measure criteria to provide criteria for preventative lifestyle modifications.

Anthropometric measurements - the measurements of the human body for estimate of fat content (Taber's Cyclopedic Medical Dictionary, 2015).

Body Mass Index (BMI) - calculation of a person's weight in kilograms divided by their height in meters squared (NIH, 2017).

Central Obesity - excess abdominal adipose tissue around the abdomen predisposing the patient to diabetes (NIH, 2017).

Education - the process of receiving or giving systematic instruction (Merriam-Webster Dictionary, n.d.).

Nurse practitioner - advanced practice nurse capable of identifying and treating medical conditions (National Council of State Boards of Nursing, NCSBN).

Obese - a BMI of 30 or greater is defined as obese (NIH, 2017).

Overweight - a BMI of 25-29.9 is defined as being overweight (NIH, 2017).

Preventative lifestyle modifications - diet and exercise recommendations to prevent excess weight gain (National Institute for Health and Care Excellence, 2015).

Self-report - information reflecting an event or situation reported (Merriam-Webster Dictionary, n.d.).

Subcutaneous adipose tissue - adipose tissue that is located under the skin (NIH, 2017).

Visceral adipose tissue - excess adipose tissue that is surrounding the abdominal organs and is referred to a torso adipose tissue predisposing the patient to diabetes (NIH, 2017).

Logic Model

The logic model was designed to correlate inputs, outputs, and planned change outcomes for this scholarly project. The model demonstrated the process for feasibility of a pilot study with the 4-State APN as participants for a clinical practice change which incorporated waist circumference screenings as a forum to present preventative weight management information. The model identified the intentions, perceived behavioral control, and the planned change outcomes of the presentation as well as the assumptions and limitations.

Intentions were defined with the identification of the diagnosis of overweight and obese patients utilizing BMI diagnostic criteria and gender-specific male and female waist circumference parameters, which initiated preventative National Institute for Health and Care Excellence (NICE, 2015) lifestyle modifications. The predesigned AGMT consisted of a tape measure with gender-specific parameters. The parameters were 40 inches, or 102 cm, for men and 35 inches, or 88 cm, for women. No measurements were recorded. A positive finding for the waist circumference screening consisted of a measurement that exceeded the gender-specific parameters and alerted the nurse practitioner to provide NICE preventative lifestyle education for weight management. The purpose of the abdominal girth inclusion was to identify those patients at risk for advance weight-related comorbidities and provide preventative education.

The pretest and posttest at the APN conference served as the evaluation for the attitudes of behavior and subjective norms outcomes. The perceived behavioral control outcomes consisted of the self-reported increased knowledge of central obesity and the inclusion of the AGMT in the primary care practice setting. The goal of waist circumference screening was to open patient-provider discussions to enable the practitioner to provide NICE preventative lifestyle modifications of diet and exercise for at-risk patients to prevent the advancement of weight-related comorbidities of diabetes.

The perceived attitude was reflected by the increased patient assessment of overweight and obese patients, documentation of overweight and obese patients, and preventative lifestyle modification education provided to overweight and obese patients. The administration of the eight-week posttest served as the evaluation for the perceived behavioral control outcomes. The behavior outcomes consisted of decreasing the

incidence of adult overweight and obese patients with lifestyle modifications. Ultimately, the outcome was hypothesized to describe the absence of the development of diabetes.

In addition, the actual behavior control outcome of the presentation was to complete a pilot study of provider attitudes toward incorporating waist circumference screenings. The AGMT with preprinted gender-specific parameters was the tangible tool to open patient-provider dialogue. Providing preventative lifestyle modifications for those patients that exceeded the gender-specific parameters was the ultimate goal of incorporating the AGMT.

The assumptions related to the quantitative study reflected the research questions and the conceptual framework. With the continued advancement of obesity with associated advanced weight-related comorbidities, evidence-based research focused on empowering providers to identify the need for preventative education. Increased waist circumference was a predominant precursor to advanced weight-related comorbidities. This study measured the willingness of providers to incorporate waist circumference screenings to initiate preventative lifestyle modifications for patients to prevent the onset of weight-related comorbidities. This pilot study served as a feasibility study for a clinical practice change. Assumptions of this scholarly project included the following:

1. Participants will incorporate waist circumference screenings.
2. Participants will complete the pretest and posttest accurately and honestly.
3. The test will be a viable pilot study to initiate a clinical practice change with utilization of the abdominal girth measurement tool.
4. Participants have a general understanding of adult central obesity and the associated comorbidities.

5. Participants will accurately reflect a generalized population of nurse practitioners.

There were perceived barriers for providers addressing obesity utilizing BMI and waist circumference. The diagnosis for overweight and obesity was by calculation of the BMI. As the BMI was automatically prepopulated into the electronic medical record (EMR), the diagnosis of overweight or obesity was validated, but providers many times failed to document the diagnosis or complete the necessary preventative lifestyle modification education. Due to time constraints and inhibitions of addressing issues of overweight and obesity, providers traditionally addressed the chief complaints at the office visit, and only reflected the BMI after a comorbidity related to the advanced weight had developed. Waist circumference screenings were not routinely obtained. As addressing elevated BMI calculations and implementing current practice guidelines were a current limitation in the primary care setting, the inclusion of a waist circumference measurement was equally challenging. Limitations of this model included the following:

1. Findings and perceptions of the project only include the APN conference participants within the four-state region of Kansas, Missouri, Oklahoma, and Arkansas and may not depict an accurate generalization of all nurse practitioner attitudes.
2. Results are self-reported without chart audits and rely on the validity of the participant.
3. Potential participant measurement errors can occur if the location of the AGMT is not accurately placed around the patient's waist

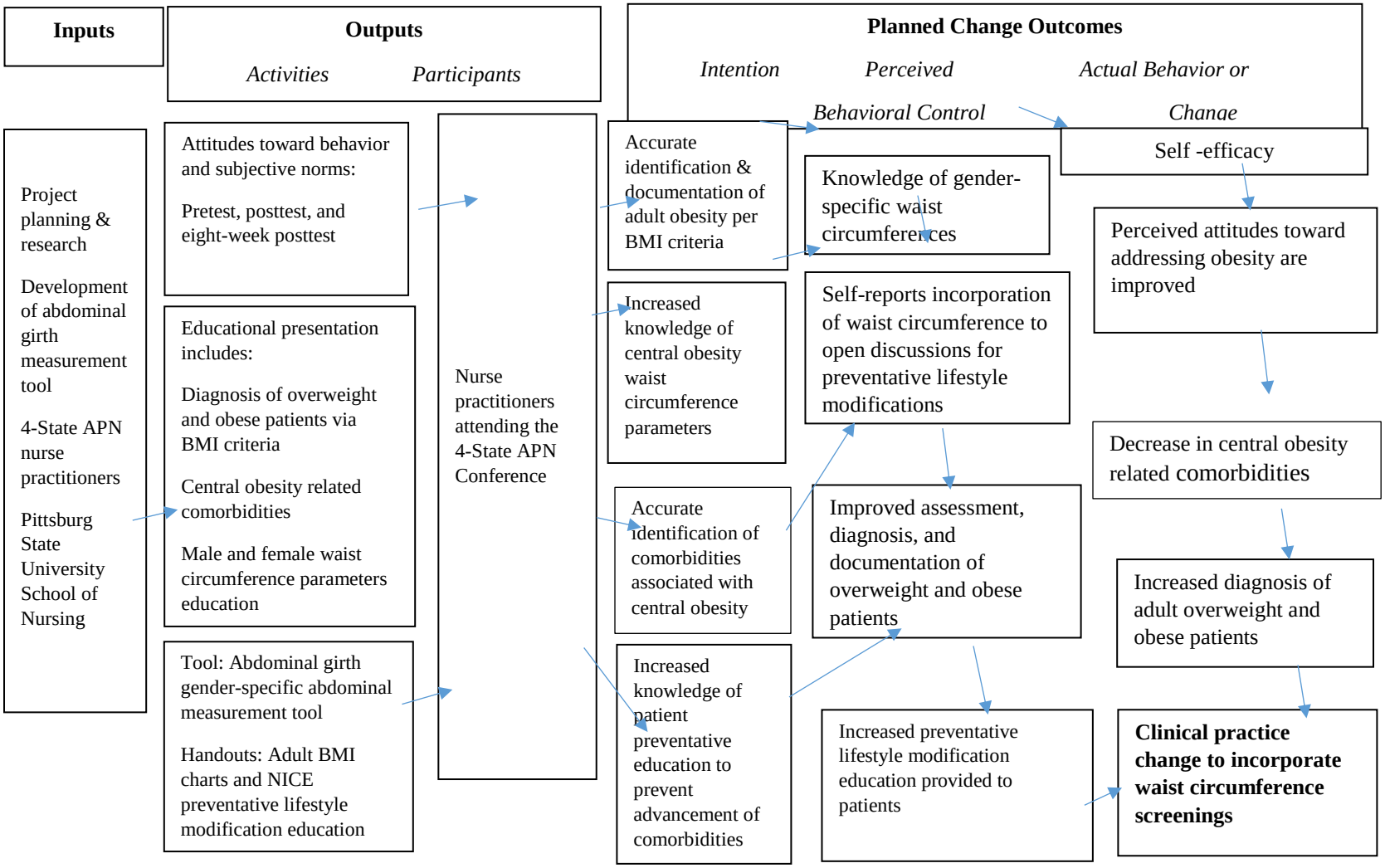

Figure 2. Application of adult waist circumference screening clinical practice change logic model

Summary

Obesity is an epidemic globally that predisposes individuals to chronic diseases. Overweight and obese patients are diagnosed by body mass index (BMI). BMI alone does not reflect the distribution of adipose tissue. According to evidence-based research, visceral adiposity or central obesity demonstrates the predisposition to diabetes. As abdominal girth increases, the risk for advanced weight-related diseases increases (Min & Stephens, 2016). As adipose tissue accumulates around the abdominal organs, the body is unable to efficiently metabolize insulin, leading to insulin resistance and predisposes patients to Type II diabetes (Misra & Vikram, 2003). An AGMT is necessary to address the progression of abdominal girth size and provide preventative weight management education. It is necessary to incorporate a practice change to address the distribution of adipose tissue to identify and intervene with preventative education for high-risk patients to decrease morbidity and mortality.

Proactive approaches for the identification of central obesity in overweight or obese adult patients were necessary to ignite a change to prevent the development of advanced weight-related comorbidities. The nurse practitioners in primary care clinics were determined as the location to intervene with visceral adiposity identification in adults 20-65 and provide lifestyle modification education from the NICE guidelines. Determining the feasibility of a waist circumference screening practice change was the ultimate goal. Presenting an educational offering at the 4-State APN conference, furnishing nurse practitioners with an AGMT with gender-specific parameters, implementing the tool in the primary care practice, and evaluating provider willingness to perform waist circumference screenings were the foci for this project.

Chapter II

Review of the Literature

The literature review focused on the identification of adult clinic patients who are overweight or obese and are at risk for advanced weight-related diseases or comorbidities. The literature sought to determine a correlation between anthropometrics of elevated body mass index (BMI) and increased waist circumference with the development of advanced weight-related comorbidities. This project served as a pilot study with nurse practitioners to determine the acceptance and feasibility of initiating a clinical practice change to incorporate the abdominal girth measurement tool (AGMT). Upon identification of at-risk patients by using the AGMT, the initiation of the National Institute for Health and Care Excellence (NICE) "Preventing Excess Weight Gain" NG7 guidelines was provided to those identified patients.

In performing a systematic review of the literature citations were utilized from PubMed Medline, ProQuest Nursing & Allied Health, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and National Guidelines Clearinghouse (NGC) databases. The keywords utilized for the search included: obesity, overweight, adults, clinical practice guidelines, lifestyle modifications, diet, exercise, preventative health, BMI, and waist circumference. Inclusion criteria for the literature review sources included articles that were in the English language, peer-reviewed scholarly journals,

dissertations, books, and practice guidelines. Over 75 articles were identified that met the above criteria, and the majority of the articles were from 2010 to 2017. Relevant historical journals or books were considered as a primary source of the historical reference from the conceptual framework of Icek Ajzen (1991).

The review of literature search was initiated with an overview of obesity in the United States identifying the connection between obesity and associated advance weight-related comorbidities. A detailed description of parameters for BMI defining the overweight or obese diagnosis are listed in Appendix A. A visceral adipose or waist circumference criteria was determined as an increased risk of morbidity and mortality (Cerhan et al., 2014). Early identification and intervention with preventative weight management through lifestyle modification guidelines of diet and exercise was the focus.

Obesity

Obesity is defined as a global epidemic by the World Health Organization (WHO). In the United States, approximately two-thirds of Americans meet the criteria to be categorized as overweight or obese (Costa et al., 2016). According to the National Institute of Health (NIH) (2017), the definition of being overweight is an excess of weight due to bone, muscle, fat, and water. In comparison, obesity is defined as an excess amount of body fat (McHugh, 2016). The etiology of being overweight and obese is contingent upon multiple factors (McHugh, 2016). The primary focus is a result of an energy imbalance (McHugh, 2016). The consumption of calories is greater than the expenditure of calories burned (McHugh, 2016). Genetics, poor dietary habits, sedimentary lifestyles, family routines, consumption of larger portion sizes, and ingestion of sugary beverages can predispose patients to being greater than ideal body weight

(Verstraeten et al., 2016). The environmental factors enabling patients to maintain this lifestyle are normal habits, financial constraints, role modelling, lack of support, and lack of readily available healthy food selections (Verstraeten et al., 2016).

According to the American Heart Association (2016), 70% of all Americans are classified as overweight or obese. Approximately two-thirds of Americans meet the criteria to be defined as overweight, and 37.7% of Americans are defined as obese (Costa et al., 2016). Approximately 7% of Americans are classified as morbidly obese (Costa et al., 2016). According to the CDC, obesity has doubled worldwide since 1980, and the estimated medical costs for obesity in the United States is $147 billion annually (McHugh, 2016). The incidence of obesity is estimated to increase 9.1% by 2020 (Costa et al., 2016). Obesity is a preventable non-communicable disease (Costa et al., 2016). A multidisciplinary preventative approach to identifying and addressing advancing weight is necessary to change this anticipated trend and redirect this culmination of current lifestyle behaviors to increase the patient's health status and improve the quality of life. The universal screening measurement tool utilized to diagnose patients who are overweight or obese is the body mass index (Lundqvist et al., 2017).

The use of body mass index (BMI) is utilized in adults 20 years of age and older as a tool to diagnose overweight and obese patients (Snodgrass, 2016). A BMI of 25-29.9 is defined as being overweight, and a BMI over 30 is defined as obesity (Snodgrass, 2016). Morbid obesity is defined as a BMI greater than or equal to 40 (Snodgrass, 2016). Research establishes that being overweight or obese is a modifiable risk factor for diabetes, cardiovascular disease, dyslipidemia, hypertension, and some types of cancers (Forte et al., 2012; Perkins et al., 2016).

Preventative weight management will be necessary to redirect the progressive trend of obesity. BMI is universally acknowledged as the gold standard to diagnose BMI, but it does not reflect the existence of adipose tissue in and around the abdomen (MacInnis et al., 2013). The location of adiposity reflects the risk for development of comorbidities (Min & Stephens, 2015; Wonder et al., 2013).

Distribution of Adipose Tissue

Body shape types can be categorized as apple-shaped android obesity or pear-shaped, or gynoid, obesity (Misra & Vikram, 2003). Android obesity consists of adipose tissue in and around the abdominal organs. Gynoid obesity consists of adipose tissue surrounding the hip and thighs (Misra & Vikram, 2003).

Obesity increases the risk of morbidity and mortality (Cerhan, 2014). The location of adipose tissue in the body directly correlates the risk (Cerhan, 2014). Adipose tissue location is divided into visceral and subcutaneous compartments (Misra & Vikram, 2003). Visceral adipose tissue or central adiposity is referred to as the adipose tissue in and around the abdomen, rather than the adipose tissue around the buttocks, hips, and thighs (Misra & Vikram, 2003). Subcutaneous adipose tissue is referred to the adipose tissue that is directly under the skin (Misra & Vikram, 2003). Visceral adiposity predisposes the patient to many weight-related comorbidities (Min & Stevens).

Visceral adiposity increases a patient's risk for the development of insulin resistance and diabetes as well as hypertension, coronary heart disease, hyperlipidemia, sleep apnea, and some forms of cancer (Wander, 2013). Obesity diagnosed by BMI alone does not account for the associated risks of visceral adiposity. According to the *American Journal of Cardiology*, it is recommended that the primary care provider assess both BMI

and waist circumference (WC) to best identify patients who are at risk for increased morbidity or mortality (Despres, 2014). They further recommend WC to be included as a vital sign (Despres, 2014). An instrument or tool to measure abdominal girth is necessary to identify the distribution of adiposity.

Waist Circumference Measurement Tools

Waist circumference (WC), hip-to-waist ratio, (HWR), waist-to-height ratio (WHR), and skinfold measurement are anthropometric measurements that reflect location of adipose tissue (Abreu et al., 2013). WC is calculated by measuring the diameter of the abdominal girth, and the landmark for measurement of WC is between the iliac crest and the lowest rib (Abreu et al., 2013).

The literature revealed inconsistencies with definitive locations to measure waist circumference, but evidence-based practice (EBP) acknowledges that either of the two recommended locations are adequate to measure waist circumference (Verweij et al., 2012). The HWR determined a ratio between measurements of the hip and waist (Limpawattana et al., 2014)). Gender-specific studies have determined that the best indicators for relationships to the advancement of weight-related comorbidities are WC for men and HWR for women (Limpawattana et al., 2014). Any result of a positive findings reflected a need for management to prevent the predisposition of advanced weight-related comorbidities (Longo, 2017). Waist-to-height ratio determined a ratio between the waist and height measurements (Limpawattana et al., 2014). Another method to measure the location of adiposity was the skinfold measurement. It consisted of the measurement of external subcutaneous adipose tissue but did not specify or reflect visceral obesity (Verweij et al., 2012). Overall, the universal anthropometric selection

best suited for determining abdominal girth for this project was WC (Limpawattana et al., 2014).

Research suggested that a retractable tape measure was recommended for ease of use. Since this project was not calculating a number but identifying those patients at-risk, a gender-specific measurement with printed parameters on the outside of the retractable tape measure was provided to conference participants. Any measurement which exceeded the printed parameters prompted the provider to initiate preventative lifestyle modification education.

Visceral Adiposity Correlation to Comorbidities

Adipose tissue produces and secretes a protein called adiponectin (Ness-Abramof & Apovan, 2008). This specialized protein protects against atherosclerosis as it improves the cells ability to utilize glucose (Ness-Abramof & Apovan, 2008). As visceral adipose tissue accumulates, the adiponectin levels are decreased, decreasing the patient's ability to utilize the glucose, rendering the patient susceptible to insulin resistance and diabetes (Ness-Abramof & Apovan, 2008).

Insulin resistance occurs when the body has available insulin but is unable to utilize the insulin by the muscles, adipose tissue, and liver cells (Ness-Abramof & Apovan, 2008). The glucose is unable to enter the cell membrane (Ness-Abramof & Apovan, 2008). When this occurs, increased serum glucose is prevalent in the bloodstream and leads to the progression to type II diabetes (Ness-Abramof & Apovan, 2008).

The endocrinological effects of obesity will become apparent as the progression of insulin resistance advances to metabolic syndrome and type II diabetes (Yang et al.,

2017). As abdominal girth increases, insulin resistance will increase the predisposition of patients to metabolic syndrome (Yang et al., 2017). Metabolic syndrome is defined as increased visceral or central obesity that may be a greater indication of obesity than that of BMI results alone (Ruiz-Canela et al., 2016). Metabolic syndrome is determined by the presence of abdominal obesity, elevated blood pressure, declining high-density lipids (HDL), elevated glucose, and elevated triglycerides (Ruiz-Canela et al., 2016). Metabolic syndrome requires at least three of the above-listed components to meet the criteria for diagnosis (Ruiz-Canela et al., 2016). Type II diabetes is diagnosed by four diagnostic tests (Ruiz-Canela et al., 2016). Initially, a fasting FSBS >125 mg/dL is determined, or a random FSBS greater than or equal to 200 mg/dL with polydipsia, polyuria, fatigue, and increased abdominal girth (Ruiz-Canela et al., 2016). A two-hour post-prandial glucose of >200 mg/dL on a 75-gram oral glucose tolerance is an indication of type II diabetes (Ruiz-Canela et al., 2016). Finally, a hemoglobin A1C greater than or equal to 6.5% is an indication of type II diabetes (Ruiz-Canela et al., 2016). The hemoglobin A1C is a reflection of the summation of the average blood glucose levels over a three-month time period. Verification of the type II diabetes diagnosis is determined by a positive finding of any two of the above-listed criteria (Ruiz-Canela et al., 2016). The culmination of physical effects predisposing patients to type II diabetes may be prevented with the inclusion of dietary and exercise lifestyle modifications but requires patient education to guide the change of current lifestyle behaviors (Mummah et al., 2016).

Cardiovascular disease related to obesity correlates as a combination of hypertension, dyslipidemia, and stroke (Yang et al., 2017). Blood pressure goals are set for hypertensive patients at each scheduled appointment. The blood pressure goal is

typically 120/80, if there are no predisposing conditions (Yang et al., 2017). Weight reduction through diet and exercise is an intervention that can reduce blood pressure by 5-10% (Yang et al., 2017). According to the Surgeon General's Report on health and physical activity, inactive patients are 50% more likely to develop cardiovascular disease than patients who are active (Yang et al., 2017). When patients are inactive, their serum C-reactive protein increases (Brown-Bowers, et al., 2017). Increasing C-reactive protein (CRP) values are a pro-inflammatory biomarker related to increasing inflammation (Brown-Bowers et al., 2017).

With rising levels of serum C-reactive protein (CRP) associated with obesity, there is an increased risk for cancer formation of the breast, endometrium, and colon (Brown-Bowers, et al., 2017). Pro-inflammatory biomarkers related to increased inflammation associated with elevated CRP have been correlated with increasing tumor necrosis factor (TNF) and have been linked the formation of cancer cells to poor dietary habits and lack of exercise (Ruiz-Canela et al., 2016). According to the World Cancer Research Fund, it is recommended for adults to be as lean as possible without becoming underweight to decreases the risk of developing cancer (Snodgrass, 2016).

According to the Centers for Disease Control recommendations for physical activity (CDC, 2018), it is recommended to eat healthy and participate in regular physical activity to decrease risks for many chronic diseases. Weight management requires a collaborative effort among multidisciplinary teams to initiate and sustain weight loss over time. Preventative measures are necessary to identify and intervene with those patients who are at high risk for obesity-related comorbidities (Alberti et al., 2009; NIH, 1998).

Provider Attitudes and Challenges

Many providers hesitate to address overweight or obese patients due to concerns of offending the patient or lack of knowledge regarding existing preventative weight management practice guidelines (Fruh et al., 2016). Provider attitudes toward obesity reflected the perceived perception of weight-related language by the patient (Puhl et al., 2013). The literature identified specific obesity-related terms to use when addressing patients who were greater than ideal body weight (Puhl et al., 2013). Research identified patient perceptions to prefer the terms *unhealthy weight* and *weight* as the most widely accepted weight-related language (Puhl et al., 2013). Due the associated stigma attached, morbidly obese, obese, and fat were determined to represent advanced weight as a negative reference in clinical practice (Puhl et al., 2013).

Provider challenges affecting implementation of the addressing weight-related education were reimbursement for weight-related treatment, lack of time during the office visit, lack of collaborative efforts and support staff to adequately screen, and lack of utilization of practice guidelines for preventing weight gain in high-risk populations (Appel et al., 2011). The Centers for Medicare and Medicaid Services (CMS) reimbursed providers for obesity treatment (Appel et al., 2011). Unfortunately, many private insurances did not cover weight-loss management in primary care (Appel et al., 2011). As providers were attempting to address the office visit related to acute or chronic issues, time constraints for the nurse and provider were limiting the available time to address weight-related issues (Appel et al., 2011). Many providers did not offer preventative weight-management education (Appel et al., 2011). Research revealed that many providers did not follow clinical practice guidelines (Surgiss et al., 2015).

With regard to provider practices, a BMI calculation was documented at each office visit. Although the BMI reflected overweight or obesity as a diagnosis, many providers did not document the diagnosis in the medical record. It was not common practice to measure abdominal girth at routine office visits (Surgiss et al., 2015). There was a need for preventative practice changes to identify overweight and obese patients that were identified as high risk by BMI and waist circumference and provide preventative lifestyle modifications.

Practice Change Guidelines and Appraisal

Given the consequences of untreated obesity, it is necessary for providers to take a proactive approach to patient care. Obesity identified by BMI alone does not calculate the associated risks of visceral adiposity (Cerhan et al., 2014). Visceral adiposity demonstrates the greatest correlation to the comorbidities of metabolic syndrome or type II diabetes, as well as other advanced weight-related comorbidities (Reis et al., 2013). This project is an educational intervention directed toward primary care nurse practitioners to incorporate an AGMT as a pilot study for a practice change.

The goal of this project was to identify those patients at risk with elevated visceral adiposity and provide preventative patient education from the National Institute of Health and Care Excellence (NICE) using the "Preventing Excess Weight Gain" guideline NG7. The guideline selected consisted of ten recommendations (Table 1). Although all ten of the guidelines reflected components of preventative weight management, eight practice recommendations were incorporated into the recommendation bundle for this project (Table 2).

Appraisal of the quality of the clinical practice guideline was determined by the AGREE II instrument (AGREE, 2009). Based on the AGREE II instrument, this guideline was determined to be strong in the quality of evidence and the strength of the recommendations (AGREE, 2009). The guidelines were incorporated into the abdominal girth measurement pilot study, as they reflected the intervention and management once a gender-specific advanced abdominal girth is identified.

NICE Guidelines

Table 1.

Summary of NICE Clinical Practice Guideline NG7 "Preventing Excess Weight Gain"

Recommendations	
1.	Encourage people to make changes in line with existing advice.
2.	Encourage physical activity habits to avoid low energy expenditures
3.	Encourage dietary habits that reduce the risk of excess energy intake
4.	Further advice for parents and caregivers of children and young people
5.	Encourage adults to limit the amount of alcohol they drink
6.	Encourage self-monitoring
7.	Clearly communicate the benefits of maintaining a healthy weight
8.	Clearly communicate the benefits of gradual improvements to physical activity and dietary habits.
9.	Tailor messages to specific groups
10.	Ensure activities are integrated with the local strategic approach to obesity

Reproduced from National Institute for Health and Care Excellence, (2015). *Preventing excess weight gain*. NICE guideline (NG7)

Table 2.

Selected Practice Change Recommendation Bundle with interventions from NICE Clinical Practice Guideline NG7 "Preventing Excess Weight Gain"

Recommendation	**Clinical Practice Change Intervention**
1. Encourage people to make changes in line with existing advice	• Incorporate diet and exercise education for patients exceeding the gender specific abdominal girth measurement tool parameters • Address necessary lifestyle modifications • Avoid extreme calorie reductions or extreme exercise regimens
2. Encourage physical activity habits to avoid low energy expenditures	• Incorporate lifestyle modifications into daily life
3. Encourage dietary habits that reduce the risk of excess energy intake	• Educate patient on food selections • Utilize plate percentage guide • Increase fruits, vegetables, protein and fiber
4. Encourage self-monitoring	• Diary of intake and exercise
5. Clearly communicate the benefits of maintaining a healthy weight	• Discuss health benefits of maintaining ideal weight to prevent onset of advanced weight relate comorbidities at each office visit • Provide written health information to patient at each visit
6. Clearly communicate the benefits of gradual improvements to physical activity and dietary habits	• Trend BMI and waist circumference at each visit • Praise successes
7. Tailor messages to specific groups	• Identify patients with elevated waist circumference and provide NICE guidelines to prevent advanced weight related comorbidities.
8. Ensure activities are integrated with the local strategic approach to obesity	• Address BMI and waist circumference parameters at each office visit.

Reproduced from National Institute for Health and Care Excellence, (2015). *Preventing excess weight gain*. NICE guideline (NG7)

Summary

The literature review identified obesity as a risk for comorbidities (Despres, 2014). The presence of adipose tissue surrounding the organs or visceral adiposity accelerated that risk (MacInnis, 2013). Specific body types with centralized abdominal obesity represented a risk factor for the development of comorbidities such as insulin resistance and type II diabetes (Sullivan, Ghuschchyan, & Ben-Joseph, 2008). A routine measurement of waist circumference at routine office visits prompted nurse practitioners to provide preventative weight management to prevent chronic disease development and progression. Based on evidenced-based research, incorporating waist circumference screenings into the patient assessment initiated the preventative weight management conversation. As the opportunity was presented to identify those at risk by waist circumference, it was predicted that provider attitudes would reflect the need for a clinical practice change that incorporates gender-specific waist circumference screenings. The methodology is discussed in Chapter III.

Chapter III

Methodology

Project Design

This chapter examines the research design for the research study. The study sought to determine provider awareness of body mass index (BMI) parameters to diagnose overweight and obese patients. In addition, the educational presentation aspired to inform the providers of gender-specific waist parameters placing the patient at risk for the development of advanced weight-related comorbidities. Following the educational presentation, the provider's awareness of gender-specific waist circumference measurement parameters that increase the patient's risk for the development of comorbidities was evaluated. This was a quantitative study to open provider-patient dialogue to provide lifestyle modifications to prevent advanced weight-related comorbidities. Previous studies identified a lack of a healthy diet and an inactive lifestyle contributed to the obesity epidemic, leading to increased instances of associated comorbidities (Longo, 2017). The nurse practitioner as the primary care provider was identified to serve as the gatekeeper to identify those patients at risk, provide lifestyle modification education, and prevent weight-related comorbidities to decrease patient morbidity and mortality (Perkins et al., 2016). This chapter identified the target population, instrument, procedure, and the statistical analysis methods of the data.

Practicing nurse practitioners with active state licensures in the four-state area (Kansas, Missouri, Oklahoma, and Arkansas) were the target population for recruitment from the 4-State Advanced Practice Nursing (APN) conference. The APN conference consisted of a collective group of nurse practitioners in the four-state area that met to discuss current issues affecting advanced practice nursing. It was founded by a group of nurse practitioners from University of Missouri-Kansas City (UMKC) class of 1996 with the objective and vision to enhance collaboration and cohesiveness among nurse practitioners while providing continued education. With more than 100 active members, the mission for the 4-State APN was identified as the following:

1. To advance health policy for access to cost effective, high-quality healthcare for everyone.
2. To promote excellence in education, research, and nurse practitioner practice.
3. Serve as a resource for the consumers, healthcare community, and nurse practitioners.
4. To act as a leader in the global and national community.

An educational PowerPoint presentation was presented at the 21st Annual 4-State APN Conference. The purpose of the presentation was to evaluate provider awareness of BMI parameters and gender-specific waist circumferences that increase a patient's risk for developing weight-related comorbidities to the target population of attending nurse practitioners. The presentation was a two-part study using a pretest, posttest, and an eight-week post-education presentation. Due to project time restraints, the quasi-experimental design was selected and consisted of a pretest and posttest (Terry, 2015). The study utilized quantitative data of provider acceptance to determine feasibility of a

clinical practice change with projecting statistical significance (Terry, 2015). The purpose of the eight-week posttest self-reported survey was to determine the clinical feasibility to incorporate waist circumference measurements as a clinical practice change.

This Doctor of Nursing Practice (DNP) scholarly project utilized a descriptive research design. The pretest identified the provider demographics, practice areas, and current preventative obesity practices. The posttest immediately following the educational presentation evaluated understanding of BMI and gender-specific waist circumferences to identify patients at risk for comorbidities. Following completion of the posttest, an abdominal girth measurement tool (AGMT) was distributed to all nurse practitioner participants at the conference. The eight-week posttest consisted of the same provider practices as the pretest but omitted the provider demographics and practice areas. This survey identified provider waist circumference measurement practices and willingness to incorporate waist circumferences into practice. The purpose was to evaluate the providers' attitude and feasibility of incorporating waist circumference measurements. The study addressed the following questions:

1. Will the educational presentation increase the nurse practitioner's accuracy of diagnosing overweight and obese patients?
2. Will nurse practitioners' perceptions for addressing obesity improve after incorporating waist circumference screenings using the abdominal girth measurement tool (AGMT)?
3. Will nurse practitioners self-report that the 4-State Advanced Practice Nursing (APN) conference education increased the diagnosis of overweight and obese adult patients in their primary care clinic?

4. Will the educational presentation increase nurse practitioner knowledge of gender-specific waist circumference measurements that increase the risk for the development of comorbidities in adults between 20-65 years of age?
5. Will nurse practitioners have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks after the presentation of education at the 4-State APN conference?

Figure 3. Study design.

Target Population

The target population for this research study included nurse practitioners and nurse practitioner students who attended the 4-State Advanced Practice Nursing (APN) conference at the Irene Ransom Bradley School of Nursing in Pittsburg, Kansas, on March 3, 2018. The 4-State APN was a group of nurse practitioners from Kansas, Missouri, Arkansas, and Oklahoma who met to discuss the most current practice issues that affect advanced nursing practice. All individuals in attendance at the conference were able to participate in the pretest and posttest.

Recruitment

The target population for recruitment consisted of nurse practitioners and nurse practitioner students at the 4-State APN conference. The eight-week posttest was only distributed to nurse practitioners with an active licensure who provided care for adult

patients 20-65 years of age. Participation in this study was approved with completion of the pretest and posttest and the voluntary submission of an email address for the eight-week posttest. Inclusion and exclusion criteria was determined by the eligible participants for the scholarly project.

Inclusion/Exclusion Criteria

Inclusion criteria for the pretest and posttest consisted of all the participants at the 4-State APN conference. To be included in the eight-week posttest, the participants were required to maintain a current APRN license in their practicing state. Inclusion criteria also included the management of adult patients 20-65 years of age.

Given the diversity of participants at the conference to include actively practicing nurse practitioners and nurse practitioner students, the nurse practitioner students were excluded from the study. Although every participant was included in the pretest and posttest, only nurse practitioners currently practicing and managing adult patients were included to participate in the eight-week posttest. Physicians, physician's assistants, and clinical nurse specialists did not meet the criteria to qualify for inclusion. No additional exclusions were determined.

Protection of Human Subjects

With adherence to the Pittsburg State University human subjects and department project guidelines, the study was exempt. The meeting with the Irene Ransom Bradley School of Nursing Institutional Review Board committee at Pittsburg State University accepted the project proposal and granted approval of the instrument tool utilized in the study. The target subjects for the study were adult nurse practitioners greater than 18 years of age. Confidentiality was maintained using a questionnaire coding system.

Information obtained from the questionnaires and survey was not disclosed outside the study.

Instruments

The study incorporated a paper/pencil pretest and posttest instrument that utilized a quantitative, descriptive format of the research questions that were analyzed following data collection. The instrument used for this study was designed to address demographics, current nurse practitioner practice areas, and perceptions of addressing adult obesity prevention. It also evaluated provider knowledge of BMI parameters to diagnose overweight and obese patients, knowledge of gender-specific waist circumference measurements that place the patient at risk for the development of comorbidities, and the feasibility for incorporation of the waist circumferences as a clinical practice change. The instrument used a multiple choice, select all that apply, and a Likert scale that consisted of 21 questions. The pretest (Appendix A) included four demographic questions. The pretest and posttest (Appendix B) consisted of four questions related to BMI based practice guidelines and waist circumference measurements. Eight questions were developed to address provider perceptions and attitudes of addressing preventative weight management. Two questions were developed to determine the feasibility of incorporating the abdominal girth measurements as a clinical practice change. The pretest included an optional submission of an email address to distribute the eight-week posttest to follow up on the evaluation of eligible participants. An eight-week posttest (Appendix C) consisted of the same questions as the pretest but excluded the demographic pretest questions.

Operational Definitions

The operational variables are defined as the specific way that data is evaluated in a study. Operational variables for this study are evaluated using a quantitative approach. The following are operational variables for this study:

1. BMI
2. Waist circumference
3. Overweight
4. Obesity
5. Education
6. Perceptions
7. Abdominal girth measurement tool

Procedure

The 4-State APN conference committee members were petitioned to approve the presentation for the inclusion of the incorporation the abdominal girth measurement presentation for this DNP scholarly project at a committee meeting in October 2017. The educational presentation was approved. The project's first three chapters were completed and provided to Irene Ransom Bradley School of Nursing scholarly project committee members for review and critique two weeks prior to the proposal presentation. On February 22, 2018, the proposal presentation was approved. Following the proposal approval, the Institutional Review Board (IRB) approval was obtained on February 26, 2018. The procedure for implementation of this project consisted of the development of an educational PowerPoint presentation that addressed nurse practitioner awareness of BMI parameters to diagnose overweight and obese patients and the gender-specific waist

circumference parameters which increase the patient's risk for the development of comorbidities such as diabetes.

Data Collection

The participants of the scholarly project were the nurse practitioners and nurse practitioner students in attendance at the 4-State APN conference on March 3, 2018, at the Irene Ransom Bradley School of Nursing (IRB SON) in Pittsburg, Kansas. The purpose of the study was explained to the conference attendees. The attendees were offered voluntary inclusion into the study if inclusion criteria was met.

Prior to the presentation, an enclosed pretest and a posttest packet with a coding system was distributed. A pretest questionnaire identifying demographics, practice areas, perception and attitudes toward addressing preventative weight management, awareness of BMI parameters, gender-specific waist circumference parameters, feasibility of an abdominal girth measurement tool as a clinical practice change, and validation criteria for inclusion in the study was administered. The pretest questionnaire was completed prior to the presentation. The posttest questionnaire was encased in a sealed envelope and completed following the presentation. The posttest consisted of questions that evaluated the provider's understanding of BMI parameters to diagnose overweight or obese patients and the provider's knowledge of gender-specific waist circumferences that increase a patient's risk for developing comorbidities. The eight-week posttest consisted of the same pretest questions with the demographic and clinical practice area questions omitted. Following the pretest and posttest, a retractable tape measure referred to as the abdominal girth measurement tool (AGMT) was provided for the APN conference participants. The AGMT consisted of a retractable tape measure with gender-specific waist circumference

measurements parameters clearly printed on the exterior (Figure 4). The gender-specific female measurement was classified as greater than 35 inches, or 88 cm, and the gender-specific male measurement was classified as greater than 40 inches, or 102 cm. No measurement numbers were to be recorded. A positive finding was a waist circumference that exceeded the gender-specific tool parameters. The goal was for providers to identify those individuals who were at risk for the development of advanced weight-related comorbidities and prompt the provider to provide National Institute for Health and Care Excellence (NICE) clinical practice guideline education to prevent disease and promote health (see Table 1). The eight-week posttest was evaluated to determine an improvement in the provider perceptions for addressing waist circumference and the feasibility of screening waist circumferences as a practice change. The foundation of this project was for nurse practitioners to identify visceral or central obesity using waist circumference screenings as a spring board to initiate lifestyle modification education of diet and exercise to prevent the advancement to weight-related comorbidities.

Figure 4. Abdominal girth measurement tool

Evaluation Plan

Data was collected immediately prior to the presentation, following the presentation, and again eight weeks later to disseminate the provider's willingness to screen waist circumference measurements. The quantitative data was collected using a combination of multiple-choice, select all that apply, and Likert-scale questions on the questionnaires. Statistical analysis was completed on the data using Excel. The question mean, percentages, and standard deviations were calculated on the pretest, posttest, and eight-week posttest. Comparisons of each test were performed to determine if the provider perceived perceptions had changed. The methodology of the project was to identify the providers' willingness to incorporate waist circumference screenings.

Treatment of Data

Data for this study was acquired from voluntary participation by nurse practitioners. Successful completion of the pretest and posttest reflected consent for participation in the study. Using the coding system of questionnaires, confidentiality was maintained throughout the study. All data obtained did not contain identifiers of participants. The data received was stored in a locked compartment that could only be retrieved by this examiner and was shredded following the completion of the project.

Outcome Data

Outcome data was collected and calculated via the pretest, posttest, and eight-week posttest responses. The outcome data was correlated with the research questions. The following questions were utilized to calculate outcomes:

1. Will the educational presentation increase the nurse practitioner's accuracy of diagnosing overweight and obese patients?

2. Will nurse practitioners' perceptions for addressing obesity improve after incorporating waist circumference screenings using the abdominal girth measurement tool (AGMT)?
3. Will nurse practitioners self-report that the 4-State Advanced Practice Nursing (APN) conference education increased the diagnosis of overweight and obese adult patients in their primary care clinic?
4. Will the educational presentation increase nurse practitioner knowledge of gender-specific waist circumference measurements that increase the risk for the development of comorbidities in adults between 20-65 years of age?
5. Will nurse practitioners have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks after the presentation of education at the 4-State APN conference?

Evaluation Measures Linked to Objectives

Evaluation measures were linked to the objectives with the logic model (see Figure 2). The study incorporated an educational PowerPoint presentation with a pretest, posttest, and eight-week posttest to determine attitudes and practices for managing obesity and waist circumference screenings. The pretest measured the provider's knowledge of BMI criteria to diagnose overweight and obese patients and the gender-specific waist circumference measurements that place a patient at risk for the development of comorbidities. The pretest also measured the provider's attitudes for addressing overweight and obese patients, current practices of promoting lifestyle modification, and waist circumference screenings. Following the educational presentation, the posttest was administered and measured the provider's knowledge of

BMI parameters and gender-specific parameters which were presented during the presentation. A printed BMI chart (Appendix A), an AGMT (see Figure 4), and guideline recommendations (see Table 2) for the patent's preventative lifestyle modification were distributed to the participants. Outcomes of the pretest and posttest evaluation measured knowledge for accurate identification of BMI parameters and knowledge of gender-specific waist circumferences that are associated with comorbidities. The eight-week posttest measured provider attitudes toward addressing overweight or obese patients, current practices of promoting lifestyle modification, and waist circumference screenings.

Instrument Linked to Measures and Objectives

The instrument or measurement tool was linked to the objectives, measurements, and outcome through the analysis of the pretest, posttest, and eight-week posttest survey format. The questionnaire measurement tool format assimilated quantitative data to analyze the provider's willingness to complete waist circumference screenings at routine office visits. Given that a specific instrument related to waist circumference was not identified, a survey tool was designed to answer the research questions. The survey incorporated evidence-based criteria to diagnose overweight and obese patients and gender-specific waist circumference measurement that increase a patient's risk for comorbidities. The tests consisted of multiple-choice questions, select all that apply questions, and a Likert rating format. The questions addressed current clinical practices and ascertained whether the educational presentation promoted the clinical practice change of waist circumference screenings. Each research question was evaluated for the intended outcomes of the educational presentation screening practices.

Table 3.

Objectives, Measurements, and Outcomes

Objective	Measurement	Outcome
Participants will increase the accuracy of diagnosing obese and overweight patients after the educational presentation.	Participants will have an increase in correct body mass index parameters to diagnose obese and overweight patients immediately following the educational presentation.	Participants will appropriately recognize body mass index parameters to diagnose obese and overweight patients.
Participants will improve perceptions for addressing obesity after incorporating the abdominal girth tool.	Participants will have an increase in percentage of waist circumference measurements using the provided abdominal girth measurement tool.	Participants will appropriately identify patients with increased BMI and elevated gender-specific waist circumferences.
Participants will have a self-report an increase in the diagnosis of overweight and obese adult patients eight weeks following the educational presentation.	Participants will have an increase in percentages of overweight and obese adult patients eight weeks following the educational presentation.	Participants will report a perceived increase in diagnosing overweight and obese patients.
Participants will have a self-reported increase in identifying gender-specific waist circumferences to identify at risk adult patients eight weeks after the educational presentation.	Participants will have an increase in percentages of correct responses regarding gender-specific waist circumferences to identify at-risk adult patients.	Participants will accurately identify gender-specific waist circumferences which place the patient at-risk for comorbidities.
Participants will have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks following the educational presentation.	Participants will have an increase in percentages of lifestyle modification education for diet and exercise eight weeks following the educational presentation.	Participants will report a perceived increase in recommending lifestyle modifications of diet and exercise.

Sustainability

According to Berendsen et al. (2015), sustainability encompasses the ability to maintain production at a specific rate at which balance can be maintained. Promoting weight circumference screenings and sustaining the recommended weight loss with appropriate lifestyle recommendations begins with the identification of gender-specific, elevated waist circumferences by the providers managing patient care. To develop a framework for sustainability relative to waist circumference measurements, financial and political realities must be considered.

To address the financial considerations, the inclusion of waist circumference identified at-risk patients and prompted providers to educate with lifestyle modifications of diet and exercise. The United States has spent more on healthcare than any other industrialized country in the world, and the effects of obesity contribute to healthcare spending (Hruby & Hu, 2016). There was a correlation between obesity, increased abdominal girth, and weight-related comorbidities (Cerhan et al., 2014). As patients were identified, educated, and redirected from potential weight-related disease processes, the overall cost for healthcare was anticipated to decrease. A preventative approach to addressing gender-specific, increased waist circumferences for adults 20-65 years of age could be to mandate waist circumference screening with the Affordable Care Act (ACA) screening revisions to proactively prevent the development of weight-related comorbidities and ultimately avoid the cost expenditures associated with obesity in the United States. To sustain change, political realities must be considered.

To ensure provider compliance with waist circumference measurements, political involvement with required policy changes were the necessary change agents for the

clinical practice change to occur. Numerous studies identified the associated risks increased waist circumferences to provide justification for a waist circumference measurement practice change. (Verweij et al., 2011; Wander et al., 2013). It was recommended by the American Heart Association (2016) to incorporate waist circumference screening at all routine office visits to identify at-risk patients.

Summary

Obesity contributing to associated advanced weight-related comorbidities is a global epidemic (WHO, 2017). Specifically, patients exceeding the gender-specific waist circumferences are at increased risk for the development of advanced weight-related comorbidities (Forte et al., 2012). For a practice change to occur, it is necessary to evaluate the provider perceptions of waist circumference screenings and offer preventative lifestyle modification practice guidelines. Empowering providers with practice recommendations to incorporate waist circumference screenings will identify patients at risk and prompt providers to educate the patient toward preventative lifestyle modifications.

The scholarly project methodology utilized an educational PowerPoint presentation with a pretest, posttest, and eight-week follow-up survey instruments to determine whether a self-reported change occurred. Utilizing an educational PowerPoint presentation with a pretest, posttest, and eight-week posttest, the perceived self-reported provider attitudes and practices for addressing obesity and waist circumference screenings were evaluated to determine if a change in provider attitudes and practices occurred. The results of the study were disseminated in Chapter IV.

Chapter IV

Evaluation Results

The overall purpose of the project was to determine the feasibility of incorporating gender-specific waist circumference measurements as a clinical practice change as an opportunity to provide lifestyle modifications. A pretest, posttest, and eight-week follow-up survey instruments were utilized as a two-part study. The pretest consisted of 21 questions which included provider demographics, provider knowledge of overweight and obese BMI parameters, provider knowledge of gender-specific waist circumferences that place the patient at-risk for the development of comorbidities, attitudes for addressing weight-related issues, and self-reported current practices. The pretest also included a voluntary submission of the provider's email address as voluntary consent to be included in the eight-week posttest. The posttest immediately following the educational presentation served as part one of the two-part study and consisted of four questions measuring knowledge of overweight and obese BMI parameters and the gender-specific waist parameters that place a patient at risk for the development of comorbidities. The eight-week posttest served as part two of the two-part study and consisted of 10 questions evaluating provider attitudes for addressing weight-related issues, and self-reported current practices. The study sought to determine if waist circumference screenings offered providers an increased opportunity to educate patients

on preventative lifestyle modifications. The study evaluated self-reported provider practices of diagnosing overweight and obese patients, measuring waist circumference, and perceived attitudes toward weight management eight weeks following the educational presentation. The aim of the scholarly project was to prompt nurse practitioners to identify those patients at increased risk and initiate preventative lifestyle modifications to prevent the advancement of weight-related comorbidities. Data was collected for the study to answer the following five research questions:

1. Will the educational presentation increase the nurse practitioner's accuracy of diagnosing overweight and obese patients?
2. Will nurse practitioners' perceptions for addressing obesity improve after incorporating the abdominal girth measurement tool (AGMT)?
3. Will nurse practitioners self-report that the 4-State Advanced Practice Nursing (APN) conference education increased the diagnosis of overweight and obese adult patients in their primary care clinic?
4. Will the educational presentation increase nurse practitioner knowledge of gender-specific waist circumference measurements that increase the risk for the development of comorbidities in adults between 20-65 years of age?
5. Will nurse practitioners have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks after the presentation of education at the 4-State APN conference?

Demographic Data of Subjects

The demographic characteristics of the sample population consisted of Advanced Practice Registered Nurses (APRNs) attending the 4-State APN conference on March 3,

2018, at the Irene Ransom Bradley School of Nursing (IRB SON) in Pittsburg, Kansas. There was a total of 38 APRN subjects in the sample. Demographic data was collected initially with four questions on the pretest prior to the educational presentation. The demographic characteristics included were the type of practice, years of practice, current state of licensures, and gender (Table 4). Following the demographic questions, the opportunity for inclusion in the eight-week follow-up survey was provided with the voluntary inclusion of the providers email address.

Table 4.

Demographics Information

Years in Practice		Frequency	Percent
	0-2 years	7	20.6
	3-5 years	9	26.5
	6-10 years	12	35.3
	11-20 years	6	17.6
	Total	34	100.0
Type of Practice		Frequency	Percent
	Family Practice	25	67.6
	Specialty	6	16.2
	other	6	16.2
	Total	37	100.0
Current States		Frequency	Percent
	Kansas	13	38.2
	Missouri	10	29.4
	Other	1	2.9
	Both Kansas and Missouri	8	23.5
	Both Kansas and Oklahoma	1	2.9
	Kansas, Missouri and Oklahoma	1	2.9
	Total	34	100.0
Gender		Frequency	Percent
	Male	2	5.4
	Female	35	94.6
	Total	37	100.0

Most of the respondents have practiced six to ten years (35.3%). Based on the demographic data obtained from the pretest, 67.6% of the nurse practitioners were family practice providers. The majority of nurse practitioners were licensed in Kansas (38.2%) and Missouri (29.4%). Thirty-two percent of the providers maintained licensure in multiple states. Of the sample population 94.6% were female and 5.4% were male.

Project Variables

The independent variable for this study was education, which consisted of BMI and gender-specific waist parameters. A 15-minute PowerPoint educational presentation was presented to the 4-State APN conference on March 3, 2018. Prior to the presentation, a pretest was administered to conference participants. Following the educational presentation, a posttest was administered.

The dependent variables were provider knowledge of obesity, gender-specific waist circumference parameters that predispose the patient to comorbidities, and the perceived attitudes of the providers to incorporate waist circumference screenings. The dependent variables were affected by the educational presentation. Provider knowledge of overweight and obese BMI parameters and gender-specific waist circumference parameters were evaluated immediately following the educational presentation on the posttest. The eight-week posttest evaluated the provider's self-reported perceived attitudes to incorporate waist circumference screenings. The variables are identified in the analysis of the study results.

Analysis of Research Questions

The research questions were answered by the pretest, posttest, and eight-week posttest. All conference attendees were permitted participation in the pretest and posttest. The study inclusion and exclusion criteria limited the qualified participants for the eight-week posttest. There were 38 participants on the pretest, 34 on the posttest, and 14 on the eight-week posttest. The instruments were utilized to analyze current provider practices and the feasibility for inclusion of waist circumference measurements as a clinical practice change. Each research question utilized one or more of the test survey questions

to identify the provider's current practices. The eight-week posttest was analyzed to determine if waist circumference measurements were accepted by the providers.

Research Question 1

Will the educational presentation increase the nurse practitioner's accuracy of diagnosing overweight and obese patients?

The obesity diagnosis component of this research question was answered utilizing data collected on the pretest from question 16 and data collected on the posttest from question one (Table 5). The questions were multiple-choice questions and were identical for both pretest and posttest. For both the pretest and the posttest, the largest response for this question was BMI >30 (pretest = 94.1%, posttest = 100%). The correct response for this question was BMI >30. It was notable that there was a 100% correct response for the posttest group.

Table 5.

*What measurement reflects your diagnosis of obesity in adults 20-65 years of age**?***

		Pretest		Posttest	
		Frequency	Percent	Frequency	Percent
	BMI >30	32	94.1	30	100
	BMI >25	2	5.9		
	Total	34	100	30	100

This overweight diagnosis component of this research question was answered utilizing data collected on the pretest from question 17 and data collected on the posttest from question two (Table 6). The questions were multiple-choice questions and were identical for both pretest and posttest. For both the pretest and the posttest, the largest response for this question was BMI >25 (pretest = 90.9%, posttest = 87.1%). The correct response for this question was BMI >25.

Table 6.

What measurement reflects your diagnosis of overweight in adults 20-65 years of age?

		Pretest		Posttest	
		Frequency	Percent	Frequency	Percent
	BMI >30	1	3	1	3.2
	BMI >25	30	90.9	27	87.1
	BMI >20	3	9.1	3	9.7
	Total	33	100	31	100

Research Question 2

Will nurse practitioners' perceptions for addressing obesity improve after incorporating the abdominal girth measurement tool (AGMT)?

Research question two was answered utilizing data collected on the pretest from questions 7-10, 12-15, and 20-21, and the data collected on the eight-week posttest was from questions 1-10. The pretest and eight-week posttest questions consisted of seven multiple-choice questions, one yes or no question, and two questions using a five-point rating scale. The questions were identical for both the pretest and the eight-week posttest. To answer research question two, data from the pretest and eight-week posttest questions were individually identified and evaluated with their respective tables. Each table described reflects a component which evaluated whether the nurse practitioner perceptions for addressing obesity improved after being provided an abdominal girth measurement tool at the 4-State APN conference. The data collection questions for research question two were individually identified and evaluated below using multiple tables of related components to answer this research question.

This research question was answered utilizing data collected on the pretest from question seven, and the data collected on the eight-week posttest was from question one

(Table 7). The pretest and eight-week posttest question consisted of a multiple-choice question, and the questions were identical for both the pretest and the eight-week posttest. For both the pretest and the eight-week posttest, the largest response for this question was 100% of the time (pretest = 52.9%, eight-week posttest = 40%). Data survey results on the eight-week posttest notably found that seven participants still did not measure BMI 100% of the time, reflecting a decrease in the consistency of measuring BMI at routine office visits.

Table 7.

How often do you measure BMI at office visits?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Never	2	5.9		
	10%	1	2.9	2	13.3
	20%			1	6.7
	30%	3	8.8	3	13.3
	40%			1	6.6
	50%	2	5.9		
	70%	2	5.9		
	80%	2	5.9		
	90%	4	11.8	2	13.3
	100% of the time	18	52.9	6	40
	Total	34	100	15	100

Research question two was answered utilizing data collected on the pretest from question eight, and the data collected on the eight-week posttest was from question two (Table 8). The pretest and eight-week posttest questions consisted of a multiple-choice frequency question and were identical for both the pretest and the eight-week posttest. For both the pretest and the eight-week posttest, the largest response for this question was daily (pretest = 36.4%, eight-week posttest = 50%). There was no correct answer. The

data from the self-reported eight-week posttest identified a self-reported increase in the diagnosis of obesity in the provider's current practice.

Table 8.

In your current practice how often do you diagnose adult patients ages 20-65 as obese?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Daily	12	36.4	7	50
	1-2 times per week	6	18.2	3	21.4
	3-5 times per week	6	18.2	2	14.3
	Monthly	4	12.1	1	7.1
	Never	5	15.2	1	7.1
	Total	33	100	14	100

Research question two was answered utilizing data collected on the pretest from question nine, and the data collected on the eight-week posttest was from question three (Table 9). The pretest and eight-week posttest questions consisted of a multiple-choice frequency question and were identical for both the pretest and the eight-week posttest. For both the pretest and the eight-week posttest, the largest response for this question was daily (pretest = 40.6%, eight-week posttest =50%). There was no correct answer. The data self-reported eight-week posttest reflected a self-reported increase in the diagnosis of overweight in the provider's current practice.

Table 9.

In your current practice, how often do you diagnose adult patients ages 20-65 as being overweight?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Daily	13	40.6	7	50.00
	1-2 times per week	4	12.5	4	28.6
	3-5 times per week	6	18.8	2	14.3
	Monthly	3	9.4		
	Never	6	18.8	1	7.4
	Total	32	100	14	100

Research question two was answered utilizing data collected on the pretest from question ten, and the data collected on the eight-week posttest was from question four (Table 10). The pretest and eight-week posttest questions consisted of a multiple-choice rating question and were identical for both the pretest and the eight-week posttest. For the pretest, the largest response for this question was 100% of the time. For the eight-week posttest, the largest response was 90% of the time (pretest = 39.4%, eight-week posttest = 35.7% of the time). There was no correct answer. The analysis of results indicates a 10% decrease in the frequency of providers recommending diet and exercise for patients at-risk eight weeks following the educational presentation.

Table 10.

Do you recommend diet and exercise for patients at risk?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Never	1	3.0		
	10%	3	9.0	2	14.3
	30%	1	3.0		
	50%	5	15.2	1	7.1
	60%			2	14.3
	70%	1	3.0	1	7.1
	80%	5	15.2	1	7.1
	90%	4	12.1	5	35.7
	100% of the time	13	39.4	2	14.3
	Total	33	100	14	100

Research question two was answered utilizing data collected on the pretest from questions 12 and 13, and the data collected on the eight-week posttest was from questions five and six (Table 11). The pretest and eight-week posttest questions consisted of a 1-10 scale rating and were identical for both the pretest and the eight-week posttest. The results reflect the 1-10 scale rating of comfort levels of providers addressing the diagnoses of obesity and overweight on the pretest and the eight-week posttest. A rating score of one reflects the provider as not comfortable addressing the diagnosis, and the rating score of ten reflects the provider as very comfortable addressing the diagnosis (pretest mean score for obesity = 7.47, eight-week posttest score for obesity = 7.86, pretest mean score for overweight = 7.5, eight-week posttest score for overweight = 7.86). Although the mean score for the pretest and posttest are similar, the comparison of standard deviations reflected similar rating scores of the eight-week posttest indicating a

decreased variability of scores (pretest obesity SD = 2.452, eight-week posttest obesity SD = 1.748; pretest overweight SD = 2.300, eight week posttest overweight = 1.7).

Table 11.

Addressing Patients as obese or overweight

	Pretest		Eight-Week Posttest	
	Mean	Std. Deviation	Mean	Std. Deviation
On a scale of 1 to 10, how comfortable are you in addressing the diagnosis of obesity with the patient?	7.47	2.452	7.86	1.748
On a scale of 1 to 10, how comfortable are you in addressing the diagnosis of overweight with the patient?	7.50	2.300	7.86	1.703

Research question two was answered utilizing data collected on the pretest from question 14, and the data collected on the eight-week posttest was from question seven (Table 12). The pretest and eight-week posttest questions consisted of a multiple-choice frequency rating question and were identical for both the pretest and the eight-week posttest. For both the pretest and the eight-week posttest, the largest response for this question was never (pretest = 64.7%, eight-week posttest = 57.1%). The findings indicate by the self-reported responses of the providers on the eight-week posttest that no increase in measuring waist circumferences at routine office visits had occurred.

Table 12.

How often do you measure waist circumference during your patient assessment?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Never	22	64.7	8	57.1
	10%	3	8.8	2	14.3
	20%	3	8.8	1	7.1
	30%	2	5.9	2	14.3
	40%	1	2.9		
	50%	3	8.8	1	7.1
	Total	34	100	14	100

The research question was answered utilizing data collected on the pretest from question 15, and the data collected on the eight-week posttest was from question eight (Table 13). The pretest and eight-week posttest questions consisted of a yes/no answer. The questions were identical for both the pretest and the eight-week posttest. For both the pretest and the eight-week posttest, the largest response for this question was no (pretest = 73.5%, eight-week posttest 57.1%). More than one quarter (26.5%) of the participants on the pretest and more than one-third (42.9%) of the participants on the eight-week posttest did not hesitate to address obesity for fear of offending the patient.

Table 13.

Do you hesitate to address obesity for fear of offending the patient?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	yes	9	26.5	6	42.9
	no	25	73.5	8	57.1
	Total	34	100	14	100

Research Question 3

Will nurse practitioners self-report that the 4-State Advanced Practice Nursing (APN) conference education increased the diagnosis of overweight and obese adult patients in their primary care clinic?

The frequency of diagnosing obese patient in practice for research question three was answered utilizing data collected on the pretest from question eight, and the data collected on the eight-week posttest was from question two (Table 14). The pretest and eight-week posttest questions consisted of a multiple-choice frequency rating question and were identical for both the pretest and the eight-week posttest. The pretest and the eight-week posttest results identified that the provider's self-reported daily diagnosis of obese patients as increased from 36.4% on the pretest to 50% on the eight-week posttest Table 14.

In your current practice, how often do you diagnose adult patients ages 20-65 as obese?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Daily	12	36.4	7	50.0
	1-2 times per week	6	18.2	3	21.4
	3-5 times per week	6	18.2	2	14.3
	Monthly	4	12.1	1	7.1
	Never	5	15.2	1	7.1
	Total	33	100.0	14	100.0

The frequency of diagnosing overweight patients in practice for research question three was answered utilizing data collected on the pretest from question nine, and the data collected on the eight-week posttest was from question three (Table 15). The pretest and eight-week posttest questions consisted of a multiple-choice frequency rating question and were identical for both the pretest and the eight-week posttest. The pretest and the

eight-week posttest results identified that the provider's self-reported daily diagnosis of overweight patients as increased from 40.6% on the pretest to 50% on the eight-week posttest.

Table 15.

In your current practice, how often do you diagnose adult patients ages 20-65 as being overweight?

		Pretest		Eight-Week Posttest	
		Frequency	Percent	Frequency	Percent
	Daily	13	40.6	7	50.0
	1-2 times per week	4	12.5	4	28.6
	3-5 times per week	6	18.8	2	14.3
	Monthly	3	9.4		
	Never	6	18.8	1	7.1
	Total	32	100.0	14	100.0

Research Question 4

Will the educational presentation increase nurse practitioner knowledge of gender-specific waist circumference measurements that increase the risk for the development of comorbidities in adults between 20-65 years of age?

The male waist circumference parameters for this research question were answered utilizing data collected on the pretest from question 18, and data collected on the posttest came from question three (Table 16). The questions were multiple-choice questions and identical for both pretest and posttest. For both the pretest and the posttest, the largest response for this question was >40 inches (pretest = 61.8%, posttest = 96.8). The correct answer was >40 inches. Respondents on the posttest did better on this item than those on the pretest.

Table 16.

Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in men ages 20-65?

		Pretest		Posttest	
		Frequency	Percent	Frequency	Percent
	>45 inches	2	5.9	1	3.2
	> 40 inches	21	61.8	30	96.8
	> 35 inches	9	21.5		
	> 30 inches	2	5.9		
	Total	34	100	31	100

The female waist circumference parameters for this research question was answered utilizing data collected on the pretest from question 19, and data collected on the posttest was from question four (Table 17). The questions were multiple-choice questions and identical for both pretest and posttest. For both the pretest and the posttest, the largest response for this question was >40 inches (pretest = 58.8%, posttest = 96.8). The correct answer was >35 inches. More respondents selected the correct answer on the posttest.

Table 17.

Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in women ages 20-65?

		Pretest		Posttest	
		Frequency	Percent	Frequency	Percent
Valid	>45 inches				
	> 40 inches	4	11.8	1	3.2
	> 35 inches	20	58.8	30	96.8
	> 30 inches	10	29.4		
	Total	34	100	31	100

Research Question 5

Will nurse practitioners have a self-reported increase in providing overweight or obese adult patients with lifestyle modification education eight weeks after the presentation of education at the 4-State APN conference?

The obese lifestyle modification education for this research question was answered utilizing data collected on the pretest from question 20, and the data collected on the eight-week posttest was from question nine (Table 18). The pretest and eight-week posttest questions consisted of a five-point scale and were identical for both the pretest and the eight-week posttest. Based on the five-point rating scale of recommendations by the self-reported eight-week posttest responses, providers most frequently chose exercise (pretest mean = 4.15, eight-week posttest mean = 4.29) as a lifestyle modification to address obesity. The summative mean indicates that providers recommend lifestyle changes about half the time (pretest mean = 3.08, eight-week posttest mean = 3.0).

Table 18.

Lifestyle Education for Obese

	Pretest		Eight-Week Posttest	
	Mean	Std. Deviation	Mean	Std. Deviation
Exercise	4.15	1.158	4.29	.914
Food Diary	3.38	1.477	3.07	1.328
Low Fat Diet	3.34	1.405	3.14	1.027
Low carbohydrate diet	3.50	1.344	3.43	1.016
High protein	3.44	1.366	3.14	1.231
Supplement meal replacement	2.31	1.230	2.08	1.038
Weight Watchers Diet	2.19	1.203	2.57	1.089
Ketogenic diet	1.97	1.204	2.46	1.391
Dietary consult	3.06	1.273	2.71	1.326
Summative Measurement	3.0845	1.00712	3.0000	.63605

NOTE: 1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

The overweight lifestyle modification education for this research question was answered utilizing data collected on the pretest from question 21, and the data collected on the eight-week posttest was from question ten (Table 19). The pretest and eight-week posttest questions consisted of a five-point scale and were identical for both the pretest and the eight-week posttest. Based on a five-point scale rating provider recommendations by the self-reported eight posttest responses, providers most frequently recommended exercise (pretest mean = 4.06, eight-week posttest mean = 4.67) for a lifestyle modification to address overweight patients in their clinical practice. Based upon the summative mean, it appears that providers recommend lifestyle changes about half the time (pretest mean = 2.90, eight-week posttest mean = 3.47).

Table 19.

Lifestyle Education for Overweight

	Pretest		Eight-Week Posttest	
	Mean	Std. Deviation	Mean	Std. Deviation
Exercise	4.06	1.229	4.67	1.496
Food Diary	3.12	1.596	3.73	1.907
Low Fat Diet	3.25	1.368	3.14	.949
Low carbohydrate diet	3.31	1.378	3.14	.949
High protein	3.21	1.474	3.07	1.207
Supplement meal replacement	2.13	.973	2.08	1.188
Weight Watchers Diet	1.97	1.159	2.43	1.222
Ketogenic diet	1.88	1.129	3.77	5.946
Dietary consult	2.82	1.290	2.36	1.499
Summative Measurement	2.9038	.97796	3.4783	1.82976

NOTE: 1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

Summary

The purpose of the project was to determine the feasibility of incorporating waist circumference measurement screenings to initiate lifestyle modification education to

prevent the onset of weight-related comorbidities. The findings of the study reflected a self-reported provider deficiency in waist circumference measurements on the eight-week posttest. Limited evidence previously supported the clinical practice of waist circumference screenings at routine office visits (Depres, 2014; Ness-Abramof & Aovian, 2008). This study disseminated the self-reported responses to determine provider willingness to incorporate waist circumference screenings. Self-reported provider practices toward diagnosing overweight and obese patients and attitudes toward weight management had not significantly changed. Self-reported provider practices for performing waist circumference screenings had also not significantly increased. This finding was evidenced by the evaluation of waist circumference measurement implementation, as evidenced on the self-reported eight-week posttest. Based on the evaluation of the study data, it was extrapolated that no discernible changes by the participating nurse practitioners were made to incorporate waist circumference screenings to identify patients at risk and provide preventative lifestyle modification education in clinical practice. The discussion of study results was reviewed in Chapter V.

Chapter V

Discussion

The study consisted of an educational presentation directed toward nurse practitioners in order to evaluate perceived nurse practitioner attitudes toward incorporating waist circumference screenings as a practice change. The study sought to determine provider knowledge of obesity, gender-specific waist parameters, and the associated health risks. A PowerPoint presentation with a pretest and posttest instrument was utilized. The abdominal girth measurement tool (AGMT) with printed gender-specific waist circumference parameters and the NICE clinical practice guideline recommendations were distributed to the participants following the presentation to implement into practice. Eight weeks following the educational presentation, a follow-up posttest was sent via email to the participants who voluntarily submitted an email address on the pretest.

Relationships of Outcomes to Research

As stated, the overall purpose of the study was for providers to screen for gender-specific abdominal girth measurements at routine office visits, and survey the provider's perceived provider attitudes. Based on this criteria, the objectives of the study were met. Provider awareness of associating excessive adipose tissue in and around the abdomen with comorbidities alerted providers to educate the patient on preventative lifestyle

modifications. As evidence-based practice findings identify increased waist circumference as a risk factor for developing comorbidities, providers were anticipated to provide preventative lifestyle modifications. To reflect this association, anticipatory changes of practice guidelines would lead to the recommendation of incorporating waist circumference screenings (Forte et al., 2012). Based on the analysis of the study results, providers had not automatically initiated waist circumference screenings without a practice guideline prompting that assessment. Results of the study data either supported or refuted the research questions.

Increased Provider Accuracy of Diagnosing Overweight and Obese Patients

Analysis of previous studies have identified inaccuracies in the provider's identification of obese and overweight patients during routine office visits (Bleich, Pickett-Blakely, & Cooper, 2011; Farran, Ellis, & Barron, 2013; Jensen et al., 2013). Previous studies analyzed self-reported data, chart review criteria, and questionnaires to determine provider practices (Terry, 2015). Self-reported data collection relied on provider recall and required the provider to provide an estimation of current practices. Questionnaires and chart reviews were identified as definitive tools to avoid data bias (Terry, 2015).

Given the previous study findings, the results of this study utilized a pretest to determine provider awareness of body mass index (BMI) parameters necessary to diagnose overweight and obese patients. Following the educational presentation, a posttest reevaluated the accuracy of the BMI parameters to diagnose overweight and obese patients. The pretest and posttest immediately following the presentation revealed that the largest response for the identification of overweight patients was BMI >25

(pretest = 90.9%, posttest = 87.1%). It could be speculated that the change in the number of the posttest sample population may have contributed to the conflicting results. The pretest and posttest results immediately following the presentation revealed the selection of the BMI >30 (pretest = 94.1%, posttest = 100%). The results identified that 100% of the participants correctly identified the BMI parameter to diagnose obese patients indicating that there was an increase in the provider accuracy of diagnosing obese patients.

Self-Reported Improved Perception of Addressing Overweight or Obese Patients

The results indicated that given the sensitive nature of the topic, providers did not have inhibitions for offending the patient by addressing weight-related issues 73.5% of the time before the presentation and 57.1% of the time eight weeks following the educational presentation. Consequently, the outcome did correlate with an improved perception toward addressing overweight and obese patients. Selection of the eight-week posttest target population could have attributed to the deviation in the results of the target population. The results of the study acknowledged an improvement in the perception of addressing obese and overweight patients. It could also be speculated that the total summation of the conference participants included in the survey on the pretest and posttest compared to those participants meeting the inclusion and exclusion criteria for the eight-week posttest as contributory to the variation in answers and perceptions.

Self-Reported Increase in Diagnosis of Overweight or Obese Patients

Based on the statistical analysis of the pretest, posttest, and eight-week posttest self-reported findings, provider awareness of the BMI criteria to diagnose overweight and obese patients was compared. Prior to the educational presentation, the providers were

accurate in diagnosing overweight adults 90.9% of the time and obese adults 94.1% of the time. Following the educational offering, providers were able to diagnose overweight adults 87% of the time and obese adults 100% of the time. Decreased accuracy for diagnosing overweight patients from pretest to the posttest. The refuted data could be speculated that preventative lifestyle modification education was not routinely addressed toward patients who were overweight. It could also be speculated that there is a deficiency in provider awareness of BMI parameters that diagnosis a patient as overweight. Provider accuracy for diagnosing obese patients was noted as 100% accurate on the posttest providing statistical evidence that learning had occurred following the educational presentation.

Diagnosing overweight and obese patients was identified by the most common response of daily diagnosing (pretest overweight = 40.6%, eight-week posttest overweight = 50%; pretest obese = 36.4%, eight-week posttest obese = 50%). Given that the diagnostic criteria of BMI was to represent a clinical diagnosis of an overweight or obese patient, the diagnosis was determined by recording height and weight (NIH, 2017). Depending on the provider's office electronic medical record (EMR) utilized, the office program should automatically prepopulate a diagnosis based on that submission of data without additional steps initiated by the provider (Mummah et al., 2016). According to the eight-week posttest, overweight and obese patients were both diagnosed daily 50% of the time. The statistical analysis of the results supported an increase in the diagnosis of overweight and obese patients on the eight-week posttest. Unfortunately, it did not correlate the diagnosis of overweight and obese patients with any preventative lifestyle modification education provided by the provider.

Self-Reported Identification of Gender-specific Waist Circumference

Analysis of the study findings of the pretest and on the posttest reflected an increase in provider awareness of the waist circumference parameters in both men and women ages 20-65 (pretest men 61.8%, posttest men 96.8%; pretest women 58.8%, posttest women 96.8%). This also identified an association of provider awareness of the increased risk for the development of weight-related comorbidities supporting an increase in knowledge following the educational presentation. Based on this correlation, a provider's preventative assessment could speculate that the provider would identify these patients at-risk by gender-specific waist circumference screenings and provide preventative lifestyle modification education. Analysis of a previous study findings supported that an increase in gender-specific waist circumferences placed patients at greater risk for the development of comorbidities (Cerhan et al., 2014; Depres, 2014; Forte et al., 2012).

A retractable tape measure abdominal girth measurement tool (AGMT) with gender specific waist circumference parameters clearly printed for provider reference was distributed to the participants of the 21st annual 4-State APN Conference. This tool was provided to the conference participants as an accessible measurement tool and prompting device to initiate preventative lifestyle modifications for at risk patients exceeding the gender specific parameters. According to previous studies, providers did not routinely measure waist circumference at routine office visits (Depres, 2014). A comparison of the pretest with the eight-week posttest self-reported findings revealed a moderate increase in lifestyle modifications of exercise from for overweight patients (pretest mean = 4.06, eight-week posttest mean = 4.67) and obese patients (pretest mean = 4.15, eight-week

posttest mean = 4.29). The data was supported by an increase in initiation of lifestyle modifications education by the nurse practitioners following the educational presentation.

Unfortunately, actual provider usage of the AGMT to initiate lifestyle modification eight weeks after the educational presentation was refuted based on the most frequent provider response of never measuring WC decreasing from 64.7% on the pretest to 57.1% % of the time on the eight-week posttest. Limited patient provider appointment time, inhibitions for offending the patient, or the unwillingness for a provider clinical practice change could speculate this lack of WC measurements. Inclusion and exclusion criteria determining the selected target population for the eight-week posttest could bed contributed to the change in sample population.

Self-Reported Increase in Lifestyle Modification Eight Weeks Following Educational Presentation

According to previous studies, diet and exercise were the most commonly utilized lifestyle modifications (Appel et al., 2011; Lundquist et al., 2017; Booth et al., 2014). This was supported with the dissemination of the study results. To analyze the implementation of provider education of lifestyle modification education eight weeks following the educational presentation, provider recommendations of lifestyle modification were disseminated.

Based on a five-point scale rating of the provider practices in recommending lifestyle modification, the most frequent provider response was exercise in both the pretest and eight-week posttest for both obese and overweight patients (pretest obese mean 4.15, eight-week posttest obese mean 4.29; pretest overweight mean 4.06, eight week posttest 4.67). An increase in the frequency was noted on both the pretests and

eight-week posttest. To disseminate the results, analysis of the standard deviation reflects an increased consistency of answers (pretest obese SD 1.158, eight-week posttest obese SD 0.914; pretest overweight SD 1.229, eight-week posttest SD 1.496).

Overall dietary lifestyle modifications were reflected by the most frequent provider response of recommending a low carbohydrate diet (pretest obese mean 3.50, eight-week posttest obese mean 3.43; pretest overweight mean 3.31, eight-week posttest overweight mean 3.14), This reflected the providers most frequent dietary recommendation of lifestyle modification in both obese and overweight patients.

Observations

Noteworthy observations of the study address the identified provider awareness of the risks associated with gender-specific increased abdominal girth measurements. Unfortunately, the study findings did not report a significant change in current practices to incorporate waist circumference screenings at routine office visits. As the evidence supports the association of increased abdominal girth with advanced weight-related comorbidities such as diabetes and coronary heart disease, it was necessary to take a broader effort for change. Given that providers follow practice guidelines, it would benefit the patient to incorporate waist circumference screenings and address patient waist circumference measurements which exceeded the gender-specific parameters.

According to analysis of the research findings, the study revealed a lapse in the ability or desire of the provider to incorporate waist circumference into clinical practice. Unless providers were required to measure waist circumference at routine office visits via a clinical practice guideline directing the measurement as a quality improvement standard

of care, no change occurred. Upon observation, practice guidelines needed to require waist circumference screenings for definitive changes to occur.

Evaluation of Conceptual Framework

The study results supported the utilization of the Theory of Planned Behavior conceptual framework. The concepts of key variables were normative beliefs, subjective norms, control beliefs, perceived behavioral control, behavioral intension, and behavior (Ajzen, 1991). The purpose of the theory sought to connect current attitudes and beliefs to modify behaviors or actions (Ajzen, 1991). To evaluate the efficacy of the application of the theory with regard to the inclusion of WC measurement at office visits, it was necessary to attach complementary qualities resembling the variables of this theory.

Analysis of the conceptual framework for this study assessed the provider's existing attitudes and beliefs toward inclusion of waist circumference screenings as a practice change. This was initiated by incorporating waist circumference screenings using the AGMT to shape the provider's behavioral intension to include waist circumference measurements. The goal of the provider's perceived behavior control was to identify those patients exceeding the gender-specific parameters and provide preventative lifestyle modification of diet and exercise.

Perceived behavioral control was an extension of self-efficacy (Ajzen, 1991). As patient outcomes were successfully obtained, the provider accomplished self-efficacy (Ajzen, 1991). Self-efficacy was a precondition to incorporate waist circumference screenings for a behavior practice change for incorporation into clinical practice, and self-efficacy was a necessary precondition for the behavioral change to occur (Ajzen, 1991). The eight-week analysis incorporating waist circumference screenings was not

sufficient to develop provider self-efficacy. Given that the provider's intensions were determined by the provider's attitudes that they have toward obesity, actual behavior control was limited. No variables were determined to be omitted. Although provider change in actual behaviors to implement waist circumference screenings into clinical practice was not successful in this research study, the conceptual framework for implementation of provider change in behavior was supported by this theory.

Evaluation of Logic Model

The waist circumference screening clinical practice change logic model was supported by the results of the study. The study evaluated the attitudes of practicing nurse practitioners at the 21st annual 4-State APN Conference to determine if waist circumference screening was accepted as a clinical practice change. The model successfully demonstrated the process to determine the feasibility for provider implementations. The model addressed intentions, perceived behavioral control, and the planned change following the educational presentation at the 4-State APN conference through the utilization of a pretest, posttest, and eight-week posttest.

A pretest prior to the educational presentation surveyed the participant's knowledge of overweight and obese patients, gender-specific waist circumference parameters that increase the risk for comorbidities, current provider practices, and provider's current interventions of lifestyle modification management. A posttest following the educational presentation measured the provider's knowledge of BMI criteria to diagnose overweight and obese and the provider's knowledge of gender-specific waist circumference parameters that increase the risk for comorbidities. The eight-week posttest evaluated the same practice criteria as the pretest but omitted

demographics. The evaluated outcomes for the study consisted of the incorporation of AGMT to initiate lifestyle modifications, self-reported improved perception of addressing overweight or obese patients, self-reported increase in diagnosis of overweight or obese patients, self-reported identification of at-risk patients, and self-reported increase in lifestyle modification eight weeks following the educational presentation.

For both the pretest and posttest, the study model outcomes revealed an increase in the participant's knowledge of gender-specific waist circumference measurements that were associated with an increase in the patient's risk for developing comorbidities immediately following the educational presentation. As represented by the pretest and eight-week posttest, a consistency for recommending lifestyle modifications of exercise was identified as the most common recommended intervention. The model supported the study for both short-term and medium-term results. Comparing the pretest to the eight-week posttest, a nominal improvement in self-reported provider inclusion of waist circumference measurements was identified to validate the logic model.

Study Limitations

The primary limitation of the scholarly project was attributed to the self-reported practices of the provider leading to potential bias in data. The self-reported data required the provider to recall an estimated summation of their current practice without a definitive chart review of exact patient interactions. Accuracy of data collection could be improved via chart reviews. Additional modifications in rating the provider inhibitions for addressing overweight and obese patients would be better served as a rating scale rather than a definitive yes or no answer.

Given that the pretest and posttest were administered via paper and pencil, legibility of writing and placement of circles on the rating scales were identified as obstacles with entering data for the study. The components of the questionnaire that were not clearly marked were marked as 99, signifying missing data and omitted from the data analysis. To improve this process and prevent a translation error, spacing the rating scale with well-demarcated areas or incorporating a fill in the circle option would have served to avoid data entry bias and error.

Implications for Future Research

Contributing to the preventative lifestyle modification efforts of diet and exercise to prevent disease and promote health, it was necessary to analyze existing processes and adjust existing provider practices to improve patient outcomes. To accomplish this task, research was necessary to accurately determine the provider and patient perception for a clinical practice change. Modifications in data collection identified from this research were identified as the next steps for future research.

Upon analysis of the data collection process, a process improvement would be to collect data from a chart review to replicate a definitive reflection of provider practices. The improved design would minimize data bias and not solely rely on the provider's recall. In a uniform approach to analyze data, data collection would also best be served from a community health center. The community health center would reflect patient office visits that would potentially compare multiple providers managing the care of a given patient. Additional data to evaluate the perceptions of patients could contribute to the acceptance and implementation of waist circumference screenings as a clinical practice change. Ongoing research to implement a practice change is necessary to

determine the feasibility for inclusion of waist circumference screenings as a practice change.

To address the core variable associated with abdominal obesity and its associated comorbidities, it was necessary to evaluate the pathophysiology of insulin resistance. As adipose tissue develops in and around the abdomen and abdominal organs, the ability of the body to effectively utilize insulin is suppressed, predisposing the patient to diabetes. The accumulative effects further lead to coronary heart disease as well as other weight-related comorbidities. Future combined studies to incorporate clinical trials of diabetes medications to effectively utilize insulin would provide justification for waist circumference screenings and address treatment interventions. Focusing on the metabolism of the body to improve efficient utilization of insulin can be a concurrent effort of clinical trials for new diabetic medications as well as patient awareness of the relationship between advancing waist circumference and expected health outcomes.

Further studies with a larger cohort of participants were recommended to determine the provider's willingness to incorporate waist circumference screenings. In addition, patient acceptance of waist circumference screenings was another contributory factor to determine attitudes toward the clinical implementation. Both provider and patient attitudes could be dually surveyed to determine a combined feasibility for the clinical practice change.

Implications for Practice, Policy, and Education

As previously stated, there is a correlation between obesity, increased abdominal girth, and weight-related comorbidities (Cerhan et al., 2014). In clinical practice, the implications of incorporating waist circumference measurements would promote health

and prevent the advancement of weight-related disease processes. To initiate waist circumference screenings, the provider and patient must be educated about the associated risks with elevated gender-specific waist circumference measurements.

As advanced practice nurses, it is necessary for nurse practitioners to take an active role to address practice management gaps, health policy, risk management, education, and an evaluation of the data collected for evidence-based practice (Apold, 2008). Previous studies associate increased abdominal girth to weight-related comorbidities, which leads to increased healthcare spending (Despres, 2014; Min & Stevens, 2015). It is necessary to incorporate a screening that incorporates measurements of abdominal girth to take a proactive practice approach to addressing the trend of increased abdominal girth and the associated healthcare costs. Studies support the findings that the inclusion of adult gender-specific waist circumferences be incorporated as a clinical practice change (Despres, 2014). The act of measuring abdominal girths would prompt the provider to provide preventative education. As a preventative measure to avoid the associated healthcare costs and decreased quality of life associated with increased gender-specific waist circumferences, waist circumference screenings would take a proactive approach to healthcare delivery.

Changes in recommended practices need to be initiated at the collegial level in preparing providers to deliver the highest quality of healthcare with improved patient outcomes. A clinical practice change to incorporate waist circumference screenings is the critical point where the decisive change will be initiated. The implications to incorporate waist circumferences will promote preventative healthcare.

Conclusion

In conclusion, the purpose of the study was to determine the feasibility of implementing a provider practice change of waist circumference screenings at routine office visits. As determined by the nurse practitioner self-reported study results, the nurse practitioners did not adopt a significant change to complete waist circumference screenings in their practices. Exceeding the gender-specific waist circumference measurement has proven to predispose patients to weight-related comorbidities such as diabetes and coronary heart disease (Depres, 2014). The outcome of the study contributed to nursing knowledge and a greater awareness of the associated risks for increased waist circumference. Although the participants were provided a retractable tape measure with gender-specific parameters at the 4-State APN conference, it was not determined to be definitively utilized within the clinical practice sites. Given that the nurse practitioners reported a predominant lack of inhibitions for addressing obesity, the nurse practitioners did not reflect a congruent increase in waist circumference measurements. Although the dissemination of the results did not definitively support or refute the provider's willingness for the inclusion of waist circumference screenings for this study, recommendations for future research were addressed. The outcome of the project identified that additional research is needed to determine feasibility for a clinical practice change. Without interventions highlighting the need for preventative lifestyle modifications, no change in current practices occurred. To change the culture of healthcare to incorporate waist circumference screenings as a practice change, both the providers and patients must take collaborative actions to alter health outcomes. Without a change in current practices, obesity is anticipated to increase at an accelerated rate unless

preventative measures are taken (Touray, 2013). Therefore, the concept of incorporating waist circumference screenings as a practice change to initiate preventative lifestyle modifications is effectively summarized by a quote from C. S. Lewis, “You can’t go back and change the beginning, but you can start where you are and change the ending.” To address the global epidemic of obesity, it is necessary to view waist circumference screenings as a provider prompting tool to educate the patient on preventative lifestyle modifications to improve patient health outcome.

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APPENDIX

Appendix A:

Body Mass Index (BMI) Table
(Adult Men & Women)

	Underweight			*Normal*						*Overweight*					*Obese*					
BMI	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**
Height	*Body Weight (pounds)*																			
4'10"	77	82	86	91	96	100	105	110	115	119	124	129	134	138	143	148	153	158	162	167
4'11"	79	84	89	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168	173
5'	82	87	92	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174	179
5'1"	85	90	96	100	106	111	116	122	127	132	137	143	148	153	158	164	169	174	180	185
5'2"	88	93	99	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186	191
5'3"	91	96	102	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191	197
5'4"	93	99	105	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197	204
5'5"	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210
5'6"	99	106	112	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210	216
5'7"	102	109	115	121	127	134	140	146	153	159	166	172	178	185	191	198	204	211	217	223
5'8"	105	112	119	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223	230
5'9"	109	115	122	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230	236
5'10"	112	119	126	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236	243
5'11"	115	122	129	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243	250
6'	118	125	133	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250	258
6'1"	121	129	137	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257	265
6'2"	125	133	140	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264	272
6'3"	128	136	144	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272	279

Source: Adapted from *Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults*, 1998.

Appendix B:

Code_____

Provider Abdominal Girth Measurement Survey

Pretest

Demographics (Check only one item for each of the following)

1. Type of Practice:
   ___ Family Practice
   ___ Adults
   ___ Specialty
   ___ Other (please specify)_____

2. Years in practice:
   ___ 0-2 years
   ___ 3-5 years
   ___ 6-10 years
   ___ 11-20 years
   ___ >20 years
   ___ NP student

3. Current state(s) of NP licensures:
   ___ Kansas
   ___ Missouri
   ___ Arkansas
   ___ Oklahoma
   ___ Other (please specify)_____

4. Your Gender:
   ___ Male
   ___ Female

5. Your email address:_____

Provider's Current Practice

6. Do you treat adult obesity within your practice?
   ___ Yes
   ___ No

7. How often do you measure BMI at office visits?
   ___ Never
   ___ 10%
   ___ 20%
   ___ 30%
   ___ 40%
   ___ 50%
   ___ 60%
   ___ 70%
   ___ 80%
   ___ 90%
   ___ 100% of the time

8. In your current practice how often do you diagnose adult patients ages 20-65 as obese?
   ___ Daily
   ___ 1-2 times per week
   ___ 3-5 times per week
   ___ Monthly
   ___ Never

9. In your current practice how often do you diagnose adult patients ages 20-65 as being overweight?
   ___ Daily
   ___ 1-2 times per week
   ___ 3-5 times per week
   ___ Monthly
   ___ Never

10. Do you recommend diet and exercise for patients at risk?
    ___ Never
    ___ 10%
    ___ 20%
    ___ 30%
    ___ 40%
    ___ 50%
    ___ 60%
    ___ 70%
    ___ 80%
    ___ 90%
    ___ 100% of the time

11. Do you prescribe weight loss medications?
    ___ Never
    ___ 10%
    ___ 20%
    ___ 30%
    ___ 40%
    ___ 50%
    ___ 60%
    ___ 70%
    ___ 80%
    ___ 90%
    ___ 100% of the time

12. On a scale from 1 to 10 how comfortable are you in addressing the diagnosis of obesity with the patient?
    Not comfortable 1 2 3 4 5 6 7 8 9 10 Very comfortable

13. On a scale from 1 to 10 how comfortable are you in addressing the diagnosis of overweight with the patient?
    Not comfortable 1 2 3 4 5 6 7 8 9 10 Very comfortable

14. How often do you measure waist circumference during your patient assessment?
    ___ Never
    ___ 10%
    ___ 20%
    ___ 30%
    ___ 40%
    ___ 50%
    ___ 60%
    ___ 70%
    ___ 80%
    ___ 90%
    ___ 100% of the time

15. Do you hesitate to address obesity for fear of offending the patient?
    ___ Yes
    ___ No

Questions related to BMI based practice guidelines and waist circumference measurements

16. What measurement reflects your diagnosis of obesity in adults 20-65 years of age?
    ___ BMI >30
    ___ BMI>25
    ___ BMI>20
    ___ BMI>10

17. What measurement reflects your diagnosis of overweight in adults 20-65 years of age?
    ___ BMI >30
    ___ BMI>25
    ___ BMI>20
    ___ BMI>10

18. Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in men ages 20-65?
    ___ >50 inches
    ___ >45 inches
    ___ >40 inches
    ___ >35inches
    ___ >30inches

19. Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in women ages 20-65?
    ___ >50 inches
    ___ >45 inches
    ___ >40 inches
    ___ >35inches
    ___ >30inches

Questions related to current practices of lifestyle modification education

Please rate the following lifestyle modifications

20. How often do you provide the following lifestyle recommendations for obese patients in your practice?

1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

a.	Exercise	1	2	3	4	5
b.	Food diary	1	2	3	4	5
c.	Low fat diet	1	2	3	4	5
d.	Low carbohydrate diet	1	2	3	4	5
e.	High protein	1	2	3	4	5
f.	Supplemental meal replacement	1	2	3	4	5
g.	Weight Watchers diet	1	2	3	4	5
h.	Ketogenic diet	1	2	3	4	5
i.	Dietary consult	1	2	3	4	5

21. How often do you provide the following lifestyle recommendations for overweight patients in your practice?

1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

a.	Exercise	1	2	3	4	5
b.	Food diary	1	2	3	4	5
c.	Low fat diet	1	2	3	4	5
d.	Low carbohydrate diet	1	2	3	4	5
e.	High protein	1	2	3	4	5
f.	Supplemental meal replacement	1	2	3	4	5
g.	Weight Watchers diet	1	2	3	4	5
h.	Ketogenic diet	1	2	3	4	5
i.	Dietary consult	1	2	3	4	5

Appendix C:

Code_____

Provider Abdominal Girth Measurement Survey

Posttest

Questions related to BMI based practice guidelines and waist circumference measurements

1. What measurement reflects your diagnosis of obesity in adults 20-65 years of age?
   ___ BMI >30
   ___ BMI>25
   ___ BMI>20
   ___ BMI>10

2. What measurement reflects your diagnosis of overweight in adults 20-65 years of age?
   ___ BMI >30
   ___ BMI>25
   ___ BMI>20
   ___ BMI>10

3. Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in men ages 20-65?
   ___ >50 inches
   ___ >45 inches
   ___ >40 inches
   ___ >35inches
   ___ >30inches

4. Which waist circumference measurement is the smallest waist measurement to identify the patient's increased risk for the development of comorbidities in women ages 20-65?
   ___ >50 inches
   ___ >45 inches
   ___ >40 inches
   ___ >35inches
   ___ >30inches

Appendix D:

Provider Abdominal Girth Measurement Survey

Eight-Week Posttest

Email Address: _____

Provider's Current Practice

1. How often do you measure BMI at office visits?
   ___ Never
   ___ 10%
   ___ 20%
   ___ 30%
   ___ 40%
   ___ 50%
   ___ 60%
   ___ 70%
   ___ 80%
   ___ 90%
   ___ 100% of the time

2. In your current practice, how often do you diagnose adult patients ages 20-65 as obese?
   ___ Daily
   ___ 1-2 times per week
   ___ 3-5 times per week
   ___ Monthly
   ___ Never

3. In your current practice, how often do you diagnose adult patients ages 20-65 as being overweight?
   ___ Daily
   ___ 1-2 times per week
   ___ 3-5 times per week
   ___ Monthly
   ___ Never

4. Do you recommend diet and exercise for patients at risk?
   ___ Never
   ___ 10%
   ___ 20%
   ___ 30%
   ___ 40%
   ___ 50%
   ___ 60%
   ___ 70%
   ___ 80%
   ___ 90%
   ___ 100% of the time

5. On a scale from 1 to 10 how comfortable are you in addressing the diagnosis of obesity with the patient?
   Not comfortable 1 2 3 4 5 6 7 8 9 10 Very comfortable

6. On a scale from 1 to 10 how comfortable are you in addressing the diagnosis of overweight with the patient?
   Not comfortable 1 2 3 4 5 6 7 8 9 10 Very comfortable

7. How often do you measure waist circumference during your patient assessment?
   ___ Never
   ___ 10%
   ___ 20%
   ___ 30%
   ___ 40%
   ___ 50%
   ___ 60%
   ___ 70%
   ___ 80%
   ___ 90%
   ___ 100% of the time

8. Do you hesitate to address obesity for fear of offending the patient?
   ___ Yes
   ___ No

Questions related to current practices of lifestyle modification education

Please rate the following lifestyle modifications.

9. How often do you provide the following lifestyle recommendations for obese patients in your practice?

1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

a.	Exercise	1	2	3	4	5
b.	Food diary	1	2	3	4	5
c.	Low fat diet	1	2	3	4	5
d.	Low carbohydrate diet	1	2	3	4	5
e.	High protein	1	2	3	4	5
f.	Supplemental meal replacement	1	2	3	4	5
g.	Weight Watchers diet	1	2	3	4	5
h.	Ketogenic diet	1	2	3	4	5
i.	Dietary consult	1	2	3	4	5

10. How often do you provide the following lifestyle recommendations for overweight patients in your practice?

1 = Never, 2 = Seldom, 3 = About half the time, 4 = Usually, 5 = Always

a.	Exercise	1	2	3	4	5
b.	Food diary	1	2	3	4	5
c.	Low fat diet	1	2	3	4	5
d.	Low carbohydrate diet	1	2	3	4	5
e.	High protein	1	2	3	4	5
f.	Supplemental meal replacement	1	2	3	4	5
g.	Weight Watchers diet	1	2	3	4	5
h.	Ketogenic diet	1	2	3	4	5
i.	Dietary consult	1	2	3	4	5