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## Implementing Screening to Assess Readiness to Change in Overweight and Obese Patients at a Patient-Centered Medical Home

Jarrold Gant

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IMPLEMENTING SCREENING TO ASSESS READINESS TO  
CHANGE IN OVERWEIGHT AND OBESE PATIENTS AT A  
PATIENT-CENTERED MEDICAL HOME

by

Jarrold E. Gant

A Doctoral Project  
Submitted to the Graduate School,  
the College of Nursing and Health Professions  
and the School of Leadership and Advanced Nursing Practice  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Nursing Practice

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## ABSTRACT

Obesity is at epidemic levels within the United States (U.S.), but the Southern U.S. has some of the most obese states. Mississippi (MS) is the most obese state in the country (Robert Wood Johnson Foundation, 2018). Factors such as diet, sedentary lifestyle, cultural influences, and socioeconomic status contribute to the state's citizens being overweight and obese.

Contributing to the state's obesity is the fact that MS has more people living in poverty than any other state (Center for American Progress [CAP], 2018). Lacking the ability to afford healthy foods and the ability to afford quality healthcare adds to the state's obesity index. This multifaceted problem has placed MS further into a spiraling trend of poor health.

This doctoral project focused on assessing readiness to change in overweight and obese patients, ages 18-64, in a patient-centered medical home in South MS. A screening tool was given to patients identified as overweight and obese. The University of Rhode Island Change Assessment Scale (DiClemente & Hughes, 1990), psychotherapy version, was used to yield a readiness to change score indicative of the stage of change the patient was in at that point in time. Patients received education using handouts on a heart-healthy diet and physical activity.

A total of 37 patients were screened over a period of three weeks as part of this project. Sex distribution showed participants were 78% female (n=29) and 22% male (n=8). The data indicated that 62% of identified patients were in the precontemplation stage meaning they had not acknowledged their weight as a problem. Furthermore, 35% were in the contemplation stage and had only begun to recognize being overweight or

obese as a problem and were beginning to consider change. A large majority, 73% (n=27), of patients screened were African American. The mean body mass index (BMI) was 40.4 kg/m<sup>2</sup>.

These project findings indicate a need to establish a patient's readiness to change. Future projects should work to enhance interprofessional practices aimed at reducing obesity within their patient population. These practices should include primary care providers, psychologists, dieticians, and social workers.

## ACKNOWLEDGMENTS

I want to acknowledge my committee chair, Dr. Cathy Hughes, for her tireless patience and encouragement. Additional acknowledgments include The University of Southern Mississippi College of Nursing and Health Professions and the School of Leadership and Advanced Nursing Practice as well as the clinic in which this project was implemented. I would also like to acknowledge Dr. Sheree Conley-Donaldson for her mentorship and educational wisdom.

## DEDICATION

This work is dedicated to my mother and grandmother, without whom, I would not be where I am today. They have encouraged, inspired, and loved me throughout my educational career and life. I would also like to dedicate this work to my dear friend Bill. Bill has been like a father to me for many years and has selflessly helped me throughout my educational journey. His thoughtfulness and devoted friendship have been and remain a treasure in my life.

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## LIST OF ABBREVIATIONS

<i>AACN</i>	American Association of Colleges of Nursing
<i>AAMC</i>	Association of American Medical Colleges
<i>ACA</i>	Affordable Care Act
<i>ADA</i>	American Diabetic Associations
<i>ASA</i>	American Stroke Association
<i>ASCVD</i>	Atherosclerotic Cardiovascular Disease
<i>BMI</i>	Body Mass Index
<i>BRFSS</i>	Behavioral Risk Factor Surveillance System
<i>CAP</i>	Center for American Progress
<i>CDC</i>	Centers for Disease Control and Prevention
<i>CHNA</i>	Community Health Needs Assessment
<i>DNP</i>	Doctor of Nursing Practice
<i>FQHC</i>	Federally Qualified Health Center
<i>HCP</i>	Health Care Provider
<i>HHS</i>	Health and Human Services
<i>HPSA</i>	Healthcare Professional Shortage Area
<i>HTN</i>	Hypertension
<i>IHME</i>	Institute for Health Metrics and Evaluation
<i>IRB</i>	Institutional Review Board
<i>LPN</i>	Licensed Practical Nurse
<i>MCOR</i>	Mississippi Center for Obesity Research

<i>MS</i>	Mississippi
<i>MSDH</i>	Mississippi State Department of Health
<i>NP</i>	Nurse Practitioner
<i>ODPHP</i>	Office of Disease Prevention and Health Promotion
<i>OMB</i>	Office of Management and Budget
<i>ORC</i>	Obesity-Related Conditions
<i>PAD</i>	Peripheral Arterial Disease
<i>PCMH</i>	Patient Centered Medical Home
<i>RN</i>	Registered Nurse
<i>SDH</i>	Social Determinants of Health
<i>T2D</i>	Type II Diabetes
<i>U.S.</i>	United States
<i>UMMC</i>	University of Mississippi Medical Center
<i>URICA</i>	University of Rhode Island Change Assessment
<i>USM</i>	The University of Southern Mississippi
<i>WIC</i>	Women, Infants, and Children

## CHAPTER I - INTRODUCTION

Mississippi (MS) is known as one of the most obese states in the United States (U.S.) (Grant et al., 2018). Many factors contribute to the state's obesity epidemic. Socioeconomic factors, along with a sedentary lifestyle and poor food choices influence the state's obesity index. Adding to the state's obesity problem is a shortage of primary care providers in rural and underserved areas. Walton (2015) states that people who consumed a southern diet had a 56% increase in risk for developing coronary heart disease. The risk is present despite accounting for multiple variables. A southern diet consists of "added fats, fried food, eggs and egg dishes, organ meats, processed meats, and sugar-sweetened beverages" (Shikany et al., 2018). According to Grant et al. (2018), MS residents could ward off major obesity-related diseases: "86,347 people could be spared from type 2 diabetes (T2D), 66,897 from coronary artery disease and stroke, 56,741 from hypertension, 35,176 from arthritis, and 4,795 from obesity-related cancer" (p. 15).

### Problem Statement and PICOT Question

Overweight and obesity have harmful impacts on body systems. These impacts are largely preventable with lifestyle change. The issues Mississippians face are cultural, socioeconomic, behavioral, and physical. These problems require a multi-angle approach to improve the health and welfare of all MS citizens. Grant et al. (2018), identifies education as a major need in order to combat the increasing rate of obesity within the state. In the clinical setting for this project, healthcare providers (HCP) do not currently establish a patient's readiness to change regarding being overweight or obese. Following

years of observation in clinical practice and an in-depth review of literature, this author explored a clinical question. In overweight and obese patients, ages 18 to 64, how does screening for readiness to change, compared to no screening, influence educating patients during a clinic office visit at a patient-centered medical home (PCMH) in South MS?

This project explored this question through evidence-based practice inquiry.

### Background

According to the MS State Department of Health (MSDH) in the MS Behavioral Risk Factor Surveillance System (BRFSS), 69.9% of adults in MS were considered overweight or obese (2018). This statistic is an increase over the previous two years. The MS Center for Obesity Research (MCOR) at the University of MS Medical Center (UMMC) noted that this percentage of overweight or obese adults will result in a projected cost of \$3.9 billion in obesity-related health care by 2018 (University of Mississippi Medical Center [UMMC], n.d.). The State of MS has developed, through the MSDH (2018), an obesity action plan that lists provision of educational material regarding healthy eating as one strategy to lower obesity within the state.

### Significance

#### *Extent of the Problem*

The MS BRFSS reported that 74.3% of men and 65.7% of women were overweight or obese in MS in 2017 (MSDH, 2018). This same report details that 35.9% of adult men are obese and 38.9% of women are obese. The largest age group affected are individuals 55-64 years of age. Individuals with the lowest income, less than \$15,000 per year, rank higher in the overall percentage of obesity. Regarding employment status,

those individuals who are not employed or retired/unable to work rank higher in obesity percentage. The Center for American Progress (CAP) (2018) reports that MS is the most impoverished state in the nation at 19.8% of its citizens living in poverty and 21.7% of Mississippians living in poverty are uninsured. Having an impoverished citizenry makes affording medical care and having access to medical professional's advice difficult. The Centers for Disease Control and Prevention (CDC, 2017) affirms that environmental factors and the quality of food consumed affect obesity.

#### *Additional Factors*

One of the environmental factors described is physical activity. A large majority of Mississippians live sedentary lifestyles. The BRFSS findings reflected that Mississippians rank second in the nation for physical inactivity, at 33.2% (CDC 2017). This lack of exercise contributes greatly to the obesity within this state. Quality of food and eating healthy, as it relates to southern cuisine, can be subjective phrases in MS. For those people raised in the south, eating healthy means having meat, several starchy sides, a dessert, and some sweet tea to drink. This diet is a part of southern culture. Southern cooking involves having fried foods and using lard in nearly every dish, including vegetables. Poverty, no insurance, sedentary lifestyle, and poor eating habits have contributed to the obesity epidemic in MS but are not wholly to blame. The lack of primary care providers also adds to this growing problem (MSDH, 2016).

#### *Lack of Primary Care Providers*

Petterson et al. (2012), offers numerous reports stating the increased demand for more primary care physicians, especially in rural and underserved areas. Fifty-six percent



of the state's physicians' practice in four counties and two-thirds of Mississippi's counties are classified as a Health Professional Shortage Area (HPSA) (Gillette, 2006). According to the federal Office of Management and Budget (OMB), 79% of the counties in MS are considered rural. This statistic makes MS one of the most rural states in the country. The MSDH reports that 84% of the primary care HPSA labels are for these counties (MSDH, 2016). The Association of American Medical Colleges (AAMC), reported that in the year 2016, MS ranked 50<sup>th</sup> in active primary care physicians per 100,000 population (Association of American Medical Colleges [AAMC], 2017). These facts, coupled with an aging population and the Affordable Care Act (ACA) increasing the number of residents with health insurance, the state's physician workforce cannot meet the demand for health care.

#### Purpose Statement

The purpose of this project is to implement screening of overweight and obese patients to determine the patient's readiness for change. Use of a screening tool will allow HCPs to customize education and educational materials regarding heart-healthy food and physical activity to the appropriate stage of change the patient is in. Education and educational materials will be given to all patients identified as overweight or more as evidenced by having a body mass index (BMI) greater than or equal to 25 kg/m<sup>2</sup>. The aim of the educational handouts is to provide useful information on self-health risks and lifestyle choices that affect overall health as well as ways to eat healthy and be more physically active.

## Theoretical Framework

The theory utilized in this project is Prochaska and DiClementi's stages of change theory. James Prochaska and Carlo DiClementi, professors of psychology, conjectured that individuals progress through five stages when altering behavior (Prochaska & DiClemente, 1982). The five stages proposed were (a) pre-contemplation, (b) contemplation, (c) preparation, (d) action, and (e) maintenance. In the pre-contemplation stage, individuals have not thought about changing their behavior and/or have not acknowledged having a problem. The contemplation stage is when an individual is thinking about changing their behavior. Preparation is the stage in which the person is ready to change. The individual is planning to act, which progresses into the next stage. The next stage is action. In this stage, the person is actively attempting to make a behavioral change. Changes are being made to the environment, behavior, and experiences. People in this stage are at high risk for relapse. The final stage is maintenance. In maintenance, the person has achieved the desired change and is not actively working to avoid relapse. Throughout this cycle of stages, a person may go between different stages at different times but ultimately must progress through all five stages for the desired behavioral modification to be achieved. This model has been applied to numerous behavioral changes, and most notably and extensively applied to smoking cessation efforts (Prochaska, DiClemente, & Norcross, 1992). Application of the stages of change theory for dietary and physical exercise modification for weight loss was reviewed in 2014 (Mastellos, Gunn, Felix, Car, & Majeed, 2014).

## Needs Assessment

### *State Level*

MS ranks first among states in adult obesity (Robert Wood Johnson Foundation, 2018). The MS BRFSS has shown that 69.9% of residents are considered overweight or obese and of these residents, 37.5% of adults in MS are considered obese (MSDH, 2018). The rate of obesity has trended up each year for decades. Obesity has a profound impact on the state financially (UMMC, n.d.).

Grant et al. (2018) cited the MCOR as saying that MS spent \$925 million in obesity-related healthcare costs. The MCOR reports that obese persons accrue 40% more in health-related costs per year compared to non-obese individuals (UMMC, n.d.). The importance of combating obesity is further underscored with the knowledge that thousands of MS residents could be spared from developing major obesity-related diseases (Grant et al., 2018).

### *Local Level*

According to the Institute for Health Metrics and Evaluation (IHME), the prevalence of obesity in female residents of Jones County was 44.9%, compared to the state and national prevalence ranking of 44.5% and 36.1 %, respectively. For men, obesity prevalence within Jones County was 42.3% with state and national percentages for men at 39.1% and 33.8% respectively. From 2001-2011, obesity prevalence dramatically increased in both men and women. For women, the increase was 24.7%, and for men, the increase was 43.9% (IHME, 2016). Contributing to a high obesity rate within the county is an overall lack of physical activity. The IHME further found that

both men and women were far below achieving the recommended amount of physical exercise (2016). The author of this Doctor of Nursing Practice (DNP) project evaluated readiness to change among overweight and obese patients at a patient-centered medical home (PCMH) within a South MS county.

## Synthesis of Evidence

### *Search Strategies*

Searches were performed in CINAHL using the terms “change theory in nursing” which yielded 91 articles, “Mississippi obesity” which yielded 18 results. A search for “Southern Mississippi diet and obesity,” using google scholar, resulted in 19,200 articles. These results were filtered for results since 2016. Additional searches in google scholar using the terms “transtheoretical model of change nursing” resulted in 22,200 results. This search is further refined to articles since 2016. This refined search resulted in 5,350 articles. Relevant articles were sorted based on titles applicable to this project and chosen after reading abstracts to further narrow the search. Another search was performed, using the Google search engine, for the terms “Mississippi obesity CDC since 2016”. This search resulted in 2,230,000 results. Results were then narrowed to the first two pages of results. Chosen articles were selected from these searches based upon relevance to the project.

### *Obesity*

Obesity is a growing health concern for the entire United States. However, many southern states are at the top of the list of most overweight or obese. MS is further categorized as having the highest obesity rate in the country (Robert Wood Johnson

Foundation, 2018). The Obesity Society has taken the position that obesity is disease in and of itself (Jastreboff, Kotz, Kahan, Kelly, & Heymsfield, 2019). Being overweight or obese has a plethora of health effects on the human body and is a leading contributor in many disease states. A few examples of these obesity-related diseases include atherosclerotic cardiovascular disease (ASCVD), stroke, hypertension (HTN), and diabetes.

### *Atherosclerosis*

Lovren, Teoh, and Verma (2015) state that a major risk factor for atherosclerosis is obesity. Atherosclerosis, attributable to obesity, has multiple suggested origins, such as endothelial dysfunction, vascular inflammation, and oxidative stress (Lovren et al., 2015). Excess adipose tissue surrounding macrovascular and microvascular systems may be linked to a disruption in endothelial chemical secretions and gene expression. These disruptions can promote vasoconstriction, vascular disease, and thrombosis, that may be connected to obesity and atherosclerosis. Vascular inflammation is a critically important link to atherosclerosis and obesity. Obese individuals have an increased amount of free fatty acids that stimulate an inflammatory response. This inflammation has been shown to activate adipose tissue that leads to impaired insulin signaling and glucose balance. Oxidative stress is greatly associated with obesity. Increased oxidative production has been shown to increase atherosclerosis likelihood (Lovren et al., 2015). Hicks et al. (2018) describes an association between obesity and the development of a type of atherosclerosis known as peripheral arterial disease (PAD). PAD, if left untreated, can progress to chronic limb ischemia and limb loss (Hicks et al., 2018). Hicks et al. (2018)

concluded that weight loss and management of obesity-related cardiovascular risk factors are critical to reducing the risks of atherosclerosis. Atherosclerosis of the carotid artery can lead to a stroke (American Stroke Association [ASA], 2018).

### *Stroke*

Mitchell et al. (2015) identified obesity as a well-known risk factor for stroke. Their results showed a correlation between increased BMI and stroke. Kernan, Inzucchi, Sawan, Macko, and Furie (2013) calculated that every one unit of measure of BMI correlates with a 5% increase in risk for cerebrovascular accident. Kernan et al. (2013) showed that the connection between obesity and increased risk for stroke can be greatly attributed to hypercholesterolemia, HTN, and diabetes mellitus. The American Stroke Association (2018) suggested that losing as little as 5 to 10 pounds can lower risks. Being diabetic also increases a patient's risk for developing a stroke (ASA, 2018).

### *Diabetes*

MS has a current adult diabetes rate of 14.3%, which places the state at third among all U.S. states and territories (Robert Wood Johnson Foundation, 2018). An increase in fat cells results in defective insulin secretion and insulin resistance (Ye, 2013). Bhupathiraju and Hu (2016) reiterate the fact that obesity and T2D are interrelated and underscore the increase in childhood obesity and T2D diagnoses. The cost associated with diabetes and obesity, according to the American Diabetes Association (ADA) (2018), totaled \$327 billion. The economic cost ascribed to diabetes rose 26% from 2012 to 2017. This growth is due to the increased pervasiveness of diabetes (ADA, 2018).

### *Hypertension*

Obesity has damaging impacts on the body. The excess weight and adipose tissue create stressors and a cascade of other comorbid conditions that are interrelated. HTN is a medical condition where obesity contributes to its severity or may be the underlying cause. Multiple hormonal changes occur due to obesity. These changes affect norepinephrine levels and renin-angiotensinogen levels that can lead to adipocyte hypertrophy, causing HTN. This cause and effect relationship affects systemic vasoconstriction, sodium and water retention and aldosterone production (Jiang, Lu, Zong, Ruan, & Liu, 2016). Wade et al. (2018) states that even young adults suffer from unhealthy effects to cardiac structure related to an elevated BMI and resultant HTN. Efforts should be taken to reduce BMI, even in young adults, to avoid long-term negative cardiovascular effects (Wade et al., 2018).

### *Cost Burden*

Hammon and Levine (2010) have identified four main economic categories that obesity has an impact. These categories include direct medical costs, productivity costs, transportation costs, and human capital costs (Hammond & Levine, 2010). Direct medical costs are attributed to the comorbid conditions associated with obesity. These costs are related to diagnosis and treatment. Studies have shown the increase in cost associated with obesity-related conditions (ORC) (Li, Huang, Ganz, Blume, & Hammer, 2015). Spieker and Pyzocha (2016) report that obese individuals had a 36% higher average healthcare cost annually. This cost included 105% higher prescription costs and the cost of seeing a primary care provider were 38% higher. A similar comparison result was

found for overweight individuals (Spieker & Pyzocha, 2016). The largest productivity loss occurs through absenteeism. Spieker and Pyzocha (2016) note that obese employees are absent from work significantly more than their non-obese coworkers. Productivity loss also encompasses disability. Disability accounts for the loss of productivity related to those individuals unable to maintain meaningful employment. Another loss to productivity to consider is premature mortality. Due to comorbid conditions related to obesity, workers dying before retirement adds to this decrease in productivity. Another economic cost is transportation costs. Larger passengers require larger vehicles, and in turn, these vehicles require more fuel (Spieker & Pyzocha, 2016). Human capital may be diminished as well. This decrease potential is related to lower educational attainment, potentially from more missed school days, lower self-esteem, or early mortality.

#### Doctor of Nursing Practice Essentials

The DNP Essentials, adopted by the American Association of Colleges of Nursing (AACN, 2006), serve as the foundation for doctoral education in nursing practice. This project relates especially to Essentials I, III, VI, and VII. Essential I is scientific underpinnings for practice. The scientific basis for nursing practice includes human biology, genomics, therapeutic sciences, and psychosocial sciences. This project focus explored psychosocial sciences, using change theory, to determine the readiness of southern, overweight and obese patients to implement diet and activity changes. The effect of these changes will be evident in human biology through therapeutic intervention and education. Essential III is clinical scholarship and analytical methods for evidence-based practice. This Essential is the basis for perusing literature, analyzing the evidence,



and implementing recommended modifications to elicit the desired response. The third identified essential is Essential VI, which is inter-professional collaboration for improving patient and population health outcomes. Through effective communication and interdisciplinary, professional communication and collaboration, patients were educated on current laboratory results, recommendations, dietary modifications, and physical activity goals. After the patient was educated on the importance of needed change, their readiness to implement changes were evaluated, and necessary referrals and consultations were provided. The last Essential addressed is Essential VII, clinical prevention and population health for improving the nation's health. Essential VII is addressed by implementing educational programs and providing educational materials aimed at health promotion and illness prevention regarding obesity and overall health effects of the clinic's patient population.

### Summary

Overweight and obesity, along with obesity-related comorbidities, account for a significant number of health issues in MS. Despite real and perceived barriers to combating obesity in this state, a path forward exists in the fight to reduce obesity in MS. Healthcare professionals should establish a patient's readiness to make lifestyle changes and work together as an interprofessional team to ensure that all available resources are being utilized to ensure a patient's quality of life is as good as it can and should be.

## CHAPTER II – METHODOLOGY

### Context

The setting for this project was a PCMH clinic in a South MS county. The county population, as of the 2010 census, was 67,761 people. The census bureau estimated the 2018 population to be at 68,461 people (U.S. Census Bureau, 2019). This site is also a federally qualified health center (FQHC) with several satellite clinics in the surrounding area. The clinic offers, internal medicine, pediatrics, dentistry, obstetrics and gynecology, behavioral health, vision, Women Infants and Children (WIC) services, social workers, and pharmacy services. The target population for this project was patients age 18 to 64, that were overweight or obese, according to BMI. Patients were identified using age and BMI. Patients had to be able to read and speak English. If the patient agreed to take part in this project, they answered a brief survey to assess their readiness for change. The HCP then provided one on one education and educational handouts on a heart-healthy diet and physical activity.

### Interventions

Patients were screened for possible participation in this project during triage. If the patient met the age and BMI criteria and were able to read and speak English, they were asked to participate in the project voluntarily. Consent to participate was obtained. Participants were able to withdraw consent to participate at any time. The University of Rhode Island Change Assessment (URICA) tool (DiClemente & Hughes, 1990), psychotherapy version (Appendix B), was administered and scored by the licensed practical nurse (LPN), registered nurse (RN), DNP student, or nurse practitioner (NP).

This screening was conducted during one office visit. This screening tool was used to assist the HCP in implementation of an individualized plan of care. One-on-one education with a nurse practitioner, regarding recommendations for a heart-healthy diet and physical activity were given to participants. Educational handouts (Appendix C) regarding taught materials were given to the patient. Staff involved in this project's implementation included LPNs, RNs, a DNP student, and NPs. All staff that participated in this project were educated on how to obtain permission to participate in the project and which patients qualified to be part of the project through an instructional handout and in-service. Participating staff were also trained on how to administer the screening tool and collect the completed forms while maintaining confidentiality.

#### Study of Interventions

The target for this project was to collect data for 40 patients or 3 weeks, whichever came first. All participants were between 18 and 64 years of age, could read and speak English, and had a BMI greater than 24.9 kg/m<sup>2</sup> on a BMI chart. No data was collected for patients not meeting the participation criteria. No incentives were offered for participation in this project. Participation was completely voluntary and confidential. Participants were derived from this one PCMH facility.

#### Measures

Statistical measures included mean, median, mode, and responses to the URICA screening tool (DiClemente & Hughes, 1990) percentages. The purpose of this project was to implement screening of overweight and obese patients to determine the patients readiness for change by means of a calculated readiness score. The objective of change

theory is for patients to progress through the stages of change to the maintenance stage in order to mitigate increasing risk of harmful health outcomes (DiClemente, Schlundt, & Gimmell, 2004). The URICA tool (DiClemente & Hughes, 1990) conveyed an objective measurement for HCPs to know which stage of change a patient was in, which allowed for the provider to tailor education and treatment plans to better meet the patient's needs.

### Analysis

At the completion of the data collection time, all screenings were collected, evaluated, and statistical data was formulated. Patient responses were kept together throughout the three-week collection time. Descriptive analysis and calculation of mean, median, and mode were the primary methods used to analyze data. URICA screenings (DiClemente & Hughes, 1990) provided readiness scores related to four stages of change. These stages were pre-contemplation, contemplation, action, and maintenance. Results were given to the clinic's board of directors and Chief Medical Officer.

### Ethical Considerations

The primary ethical considerations for this project were the patient's right to privacy, education, confidentiality, and consent. Participants could withdraw consent at any time. All surveys were given in a private, patient exam room. No identifying information was collected on the patient surveys, other than age, height, weight, and calculated BMI. All forms and data were kept in a password-protected, personal computer or a locked box.

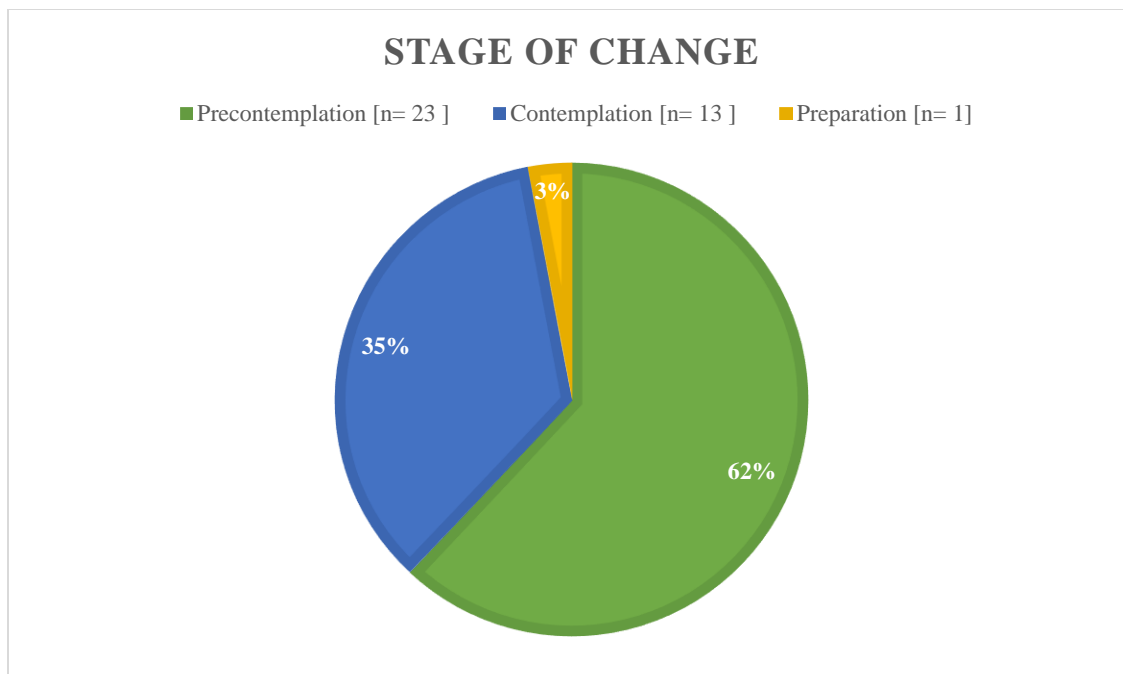
## Summary

After receiving approval from the Board of Directors at the PCMH in South MS and The University of Southern Mississippi (USM) Institutional Review Board (IRB), data collection began for IRB Protocol Number IRB-19-59 (Appendix A). Patients were identified for participation in this project by age, sex, and BMI. Identified participants were then asked if they were willing to participate. Any participant could withdraw from this project at any time. Willing participants were given a screening to determine their readiness for change. Individualized education and plans of care were then implemented by the HCP. Patient education was provided regarding heart-healthy diet and physical activity by the nurse practitioner and DNP student. Educational handouts were given to participants covering all taught material.

## CHAPTER III – RESULTS

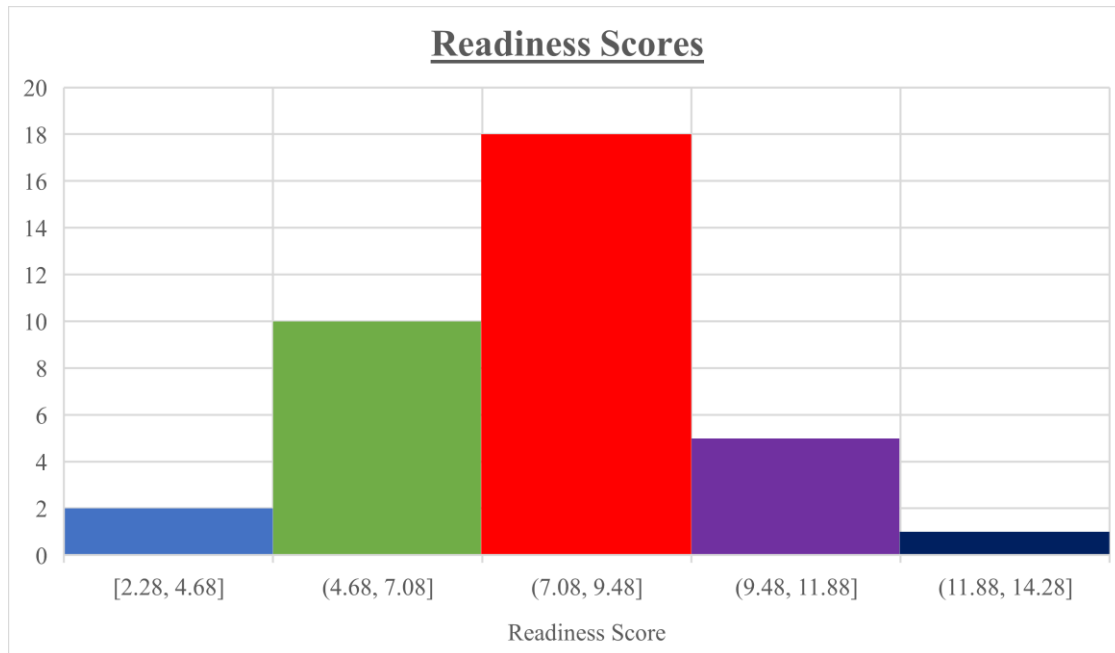
The purpose of this project was to employ screening of overweight and obese patients to establish the patient's readiness to change. Another intended result was to inform the HCP which stage of change the patient was in so that education and treatment plans could be more tailored to meet the patient's needs. The project occurred during July 2019 at a patient-centered medical home clinic in South MS. This project surveyed 37 patients who met the inclusion-criteria. Three individuals meeting the inclusion criteria did not participate because of limited time in the clinic or personal time restraints. The surveys were collected over a three-week period. All surveys were analyzed by this writer.

The survey analysis showed 62% (n=23) of respondents were in the precontemplation stage, 35% (n=13) were in the contemplation stage, and 3% (n=1) was in the preparation stage. No participants were in the action and maintenance stages. The precontemplation stage is characterized by the respondent being unaware their weight is a problem and they have no intention to make changes soon. Individuals in the contemplation stage have acknowledged having a weight problem and are considering making changes (U.S. Department of Health and Human Services [HHS], 2012). These results indicate that 62% of patients surveyed have not acknowledged that their weight is a problem and 35% have only begun to acknowledge having a problem with weight.



*Figure 1. Stage of Change.*

The figure above shows the stages of change found using the URICA survey. Most participants were in precontemplation (62% or n=23). Other stages were contemplation (35% or n=13) and preparation (3% or n= 1). No participants were in the action and maintenance stages.



*Figure 2. Readiness Scores.*

8 or less = Pre-contemplation Stage

9-11 = Contemplation Stage

12-14 = Preparation or Action Stage

Readiness scores show a normal distribution around the center. The readiness mean is 7.86. The readiness median and mode was 8.

Median and mode were calculated with readiness scores rounded to the nearest whole number.

Using Figure 3, the URICA screening scoring table, readiness scores were calculated (The University of Maryland, Baltimore County, n.d.). The results indicate that as the readiness score increased, so did the respondents' readiness to change, as demonstrated in Figure 2. The readiness scores median and mode were 8. Readiness score median and mode were calculated with scores rounded to the nearest whole number. Most screening participants were found to be predominantly in the precontemplation and contemplation stages.



## URICA 32 Item Versions

	Precontemplation	Contemplation	Action	Maintenance
Question Numbers	1	2	3	6
	5	4 (omit)*	7	9 (omit)*
	11	8	10	16
	13	12	14	18
	23	15	17	22
	26	19	20 (omit)*	27
	29	21	25	28
	31 (omit)*	24	30	32
Total:				
Divide by:	7	7	7	7
Mean:				

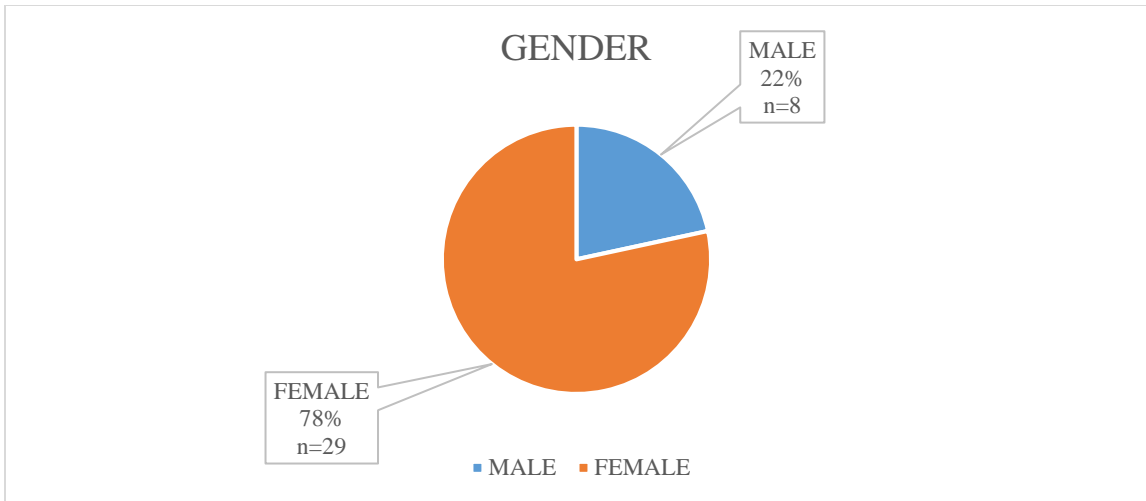
\*For the questions that say "Omit" do not include them in your summation of scores for each stage subscale.

To obtain a Readiness to Change score, first sum items from each subscale and divide by 7 to get the mean for each subscale. Then sum the means from the Contemplation, Action, and Maintenance subscales and subtract the Precontemplation mean ( $C + A + M - PC = \text{Readiness}$ ).

### Figure 3. Scoring Table for URICA Screening Readiness Score

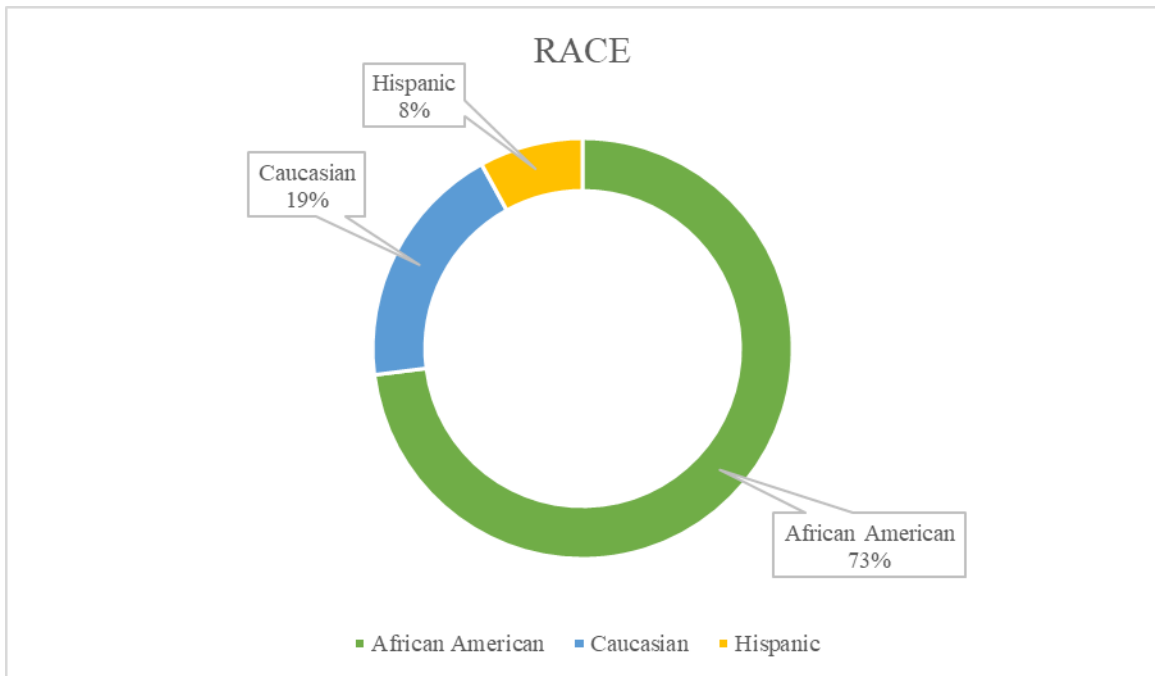
The University of Maryland, Baltimore County. (n.d.). *The HABITS Lab at UMBC*. Retrieved from <https://www.habitslab.umbc.edu/urica-readiness-score/>

Participants were 78% female (n=29) and 22% male (n=8). This data is represented in Figure 4 below. The racial makeup of screening participants was 73% African American (n=27), 19% Caucasian (n=7), and 8% Hispanic (n=3). This data is represented in Figure 5. The sample ages ranged from 18-64 years of age. A representation of the age distribution can be seen in Figure 6. Body Mass Indices ranged from 25.7 – 66.4 kg/m<sup>2</sup> with a mean BMI of 40.4 kg/m<sup>2</sup>. A representation on participants' BMI is shown in Figure 7. The data and results from this project were reported to the clinic board of directors, chief medical officer, HCPs, and staff. The project results can be used as a basis for an interprofessional practice program aimed at treating overweight and obese patients.



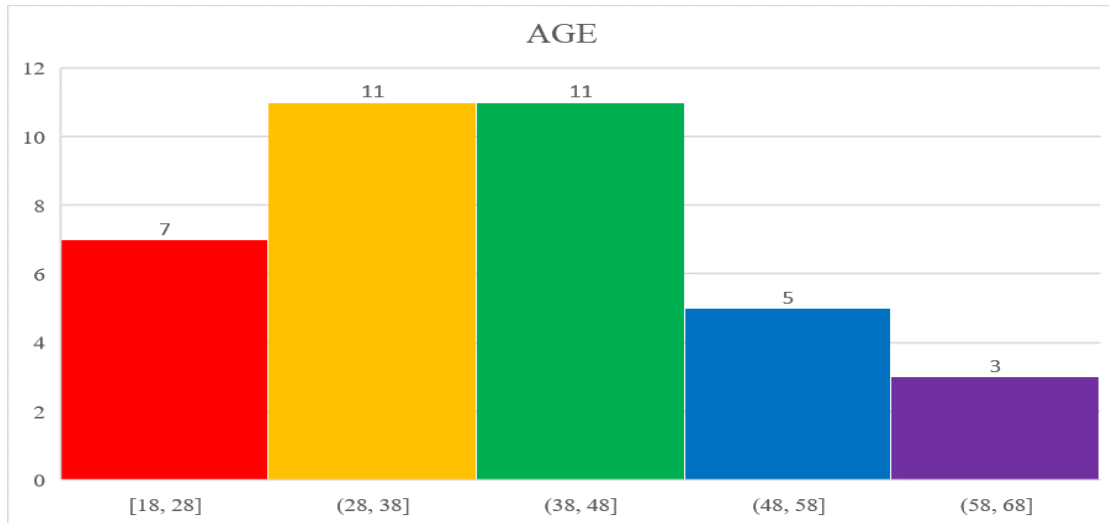
*Figure 4. Gender.*

The figure above represents the sex demographic of screening participants. Those individuals screened as part of the project were 78% female (n=29) and 22% male (n=8). The majority were female.



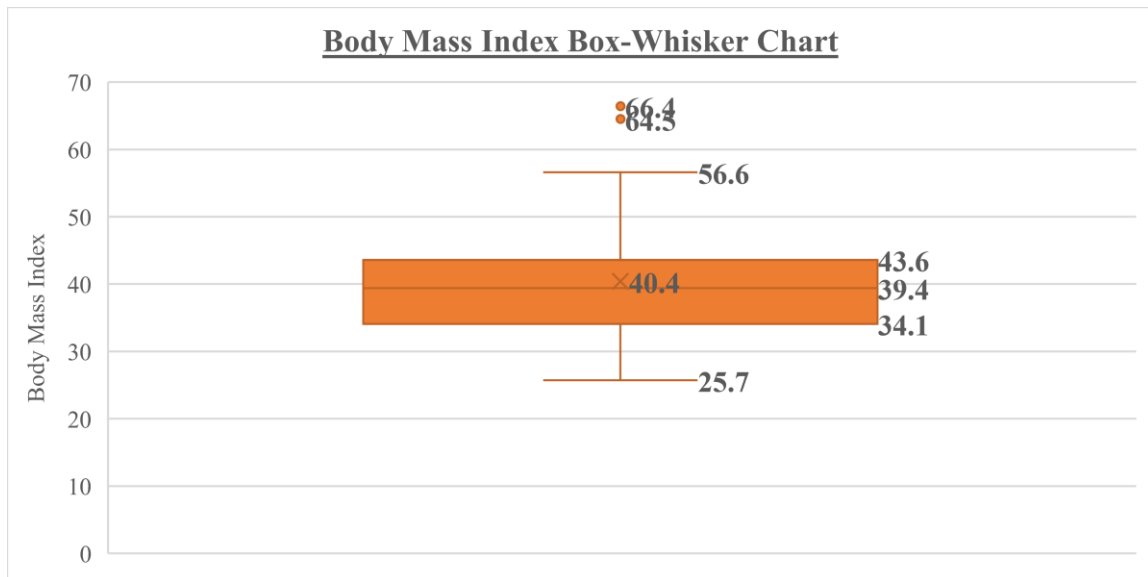
*Figure 5. Race.*

The figure above is representative of the racial demographic of screening participants. Project participants were primarily African American (73% or n=27), followed by Caucasian (19% or n=7), and Hispanic (8% or n=3).



*Figure 6. Age.*

The figure above is an analysis of the ages of screening participants. The diagram shows 7 participants were between ages 18 and 28, 11 were between 28 and 38 years of age, 11 were between 38 and 48 years of age, 5 were between 48 and 58 years of age, and 3 were between 58 and 68 years of age. Most project participants were between 28 and 48 years of age.



*Figure 7. Body Mass Index Box-Whisker Chart.*

The figure above shows a distribution of BMI from screening participants. The minimum BMI is 25.7 kg/m<sup>2</sup>, the second quartile is 34.1 kg/m<sup>2</sup>, the third quartile is 43.6 kg/m<sup>2</sup>, and the maximum BMI is 56.6 kg/m<sup>2</sup>. The two outlier BMIs are 64.5 kg/m<sup>2</sup> and 66.4 kg/m<sup>2</sup>. The mean BMI is 40.4 kg/m<sup>2</sup>. The median BMI is 39.4 kg/m<sup>2</sup>. The mode was determined by rounding BMI to the nearest whole number. The resultant mode was 44 kg/m<sup>2</sup>.

## Summary

Patients who participated in this doctoral project were predominantly African American women. The mean BMI of screened participants was 40.4 kg/m<sup>2</sup>. Most participants (n=22) were between 28 and 48 years of age. Readiness scores were a normal distribution with most scores between 7.08 and 9.48. The readiness score mean was 7.86. The readiness scores median and mode were 8. Median and mode were calculated with readiness scores rounded to the nearest whole number. The majority (62%) of screened participants were in the precontemplation stage of change, while 35% were in the contemplation stage. No participants were in the action and maintenance stages.

## CHAPTER IV – DISCUSSION

### Overview

This project focused on implementing a screening tool to assess readiness to change in overweight and obese patients at a PCMH in South MS. Another aim was to introduce consistent patient education from HCPs regarding a heart-healthy diet and exercise. MS is at the forefront of the obesity epidemic plaguing the United States (Grant et al., 2018). Many factors contribute to obesity and are modifiable with proper resources and planning. MS has developed an obesity action plan (MSDH, 2018) aimed at reducing the rate of obesity within the state. Education has been identified as a major need. HCPs play a major role in educating, encouraging, and assisting patients with healthy ways to diet, exercise, and ultimately lose weight. Assessing a patient's readiness to change is vital to understanding how to best meet the patient's needs and assist them in making diet and exercise lifestyle changes.

Approval to implement the URICA screening tool (DiClemente & Hughes, 1990) was obtained from the USM IRB and the Chief Medical Officer at the proposed clinic. Prochaska and DiClementi's stages of change theory provided a basis for this project. Once IRB approval was obtained, healthcare providers and nurses were educated on proper ways to identify overweight and obese patients using BMI. HCPs were given two educational handouts to supply patients with information on how to maintain a heart-healthy diet and be more active through physical activity. Over a three-week period, 37 patients agreed to participate in the screening and each of these patients completed the URICA screening tool (DiClemente & Hughes, 1990), received individual education and

educational handouts. Three patients declined to participate due to lack of time in their personal schedule. The results of the screening using the URICA tool (DiClemente & Hughes, 1990) was analyzed for aggregate data using de-identified data. Mean, median, and mode for the survey results and BMI were calculated. Screening participants were primarily in the pre-contemplation (62%) and contemplation (35%) stages of change theory while only one participant (3%) was in the preparation stage. No participants were in the action and maintenance stages. The mean BMI was 40.4 kg/m<sup>2</sup>. The median BMI was 39.4 kg/m<sup>2</sup>. The BMI mode, when rounded to the nearest whole number, was 44 kg/m<sup>2</sup>. Readiness scores showed a mean of 7.86 kg/m<sup>2</sup> with a median and mode of 8. These results indicate that most patients did not recognize being overweight or obese as a problem, according to the stages of change. The need to assess readiness to change and implement steps to progress through the stages of change was recognized through this project.

#### Limitations and Barriers

Limitations and barriers were encountered during implementation of this project. The limitations included staff buy-in/interest in the project, limited time to educate staff on the background, significance, and need for intervention, and limited time during patient encounters. Nursing staff did not screen all eligible participants for various reasons including lack of incentive to participate and lack of time during encounter. Patient encounter time is limited within the clinic due to increased need for productivity. Staff buy-in/interest and limited time during the patient encounter were also barriers to full implementation within this clinic. The addition of the URICA screening (DiClemente

& Hughes, 1990) was viewed as slowing down the time from triage to provider encounter.

### Implications for Future Practice

#### *Population*

This DNP project showed a need to establish a patient's readiness to change. However, considering the educational level of the patient is also important (Fruh, 2017). The ability of patients to use the education their HCP gives relies on the patient's ability to understand. A need to conduct education assessments and personal literacy level assessments exists within the community. The necessity to determine knowledge deficits is recognized as well. Not all patient's lack educational understanding or literacy but may have deficits in their knowledge of overweight and obesity. The clinic should conduct a community health needs assessment (CHNA) to help communicate local resources such as food, medical centers, therapy services, dental services, pharmacies, bus routes, community events, and recreational venues.

#### *Staff Education*

Providing more in-depth education to staff, including providers, regarding the background, significance, and the need for intervention could have increased staff buy-in for this project. During the staff in-service regarding this project, this author realized that the HCPs and nursing staff had little to no knowledge about the stages of change. Educating HCPs and nurses about the five stages of change would be beneficial for future implementation efforts. Developing a continuing education module on the stages of change is a potential method of delivery. Additional modules could focus on building

motivational interviewing skills and motivational learning for healthcare workers. Further modules could then be developed to address how to enhance motivation to change using treatment improvement protocol, Chapters 4-7, developed by the Substance Abuse and Mental Health Services Administration (HHS, 2012). All the potential educational projects mentioned above should be developed for use in an interprofessional practice setting. An unintended result of this project was consistency in the educational information and handouts provided to patients.

### *Interprofessional Practice*

In an Institute of Medicine (2003) report, healthcare professionals were tasked with working together as teams to provide best practice patient care. Becoming familiar with the scope and education of other disciplines within the healthcare field will help prevent errors, increase effectiveness and reduce costs (Jakubowski & Perron, 2018). This DNP project can be expanded by creating interprofessional practice teams within the patient-centered medical home that can address obesity. The team should consist of primary care providers, psychologists, social workers, exercise physiologists, and dietitians. This team would be able to specifically address the physical, mental, and socioeconomic factors that contribute to overweight and obesity.

### *Social Determinants of Health*

Social determinants of health (SDH) are the “conditions in the places where people live, learn, work, and play” (CDC, 2018, para. 1). All these conditions affect an individual’s health. Factors such as access to food sources, ability to pay for food, access to HCPs, ability to pay to see HCPs, ability to pay for prescriptions and tests, ability to



afford shelter and water, and many more are issues that are a part of SDH. Assessing SDH when formulating treatment plans for any disease or condition is incumbent upon HCPs. Consideration of SDH when evaluating and caring for overweight and obesity is particularly important. The Healthy People 2020 report (Office of Disease Prevention and Health Promotion [ODPHP], 2019) emphasis focusing on SDH by making it one of the four primary goals for the decade.

#### *Long-term Follow-up*

Implementation of quarterly follow-up would be beneficial for future adaptations of this project. Gathering and tracking data such as BMI, body measurements, vital signs, and laboratory tests could provide further avenues toward addressing overweight and obesity. Laboratory tests would include lipid panels, thyroid stimulating hormone, and a complete metabolic panel. The creation of an interprofessional practice team within the PCMH is one way to address the mental, physical, and socioeconomic aspects of change in order to address overweight and obesity. This practice team would be the avenue by which long-term follow-up could be implemented. Continuous quality improvement data can be gathered by having a quarterly follow-up schedule.

#### Conclusions

This DNP project implemented a screening tool to assess readiness to change in overweight and obese patients, ages 18 to 64 years, at a PCMH. The screening yielded a calculated readiness score. Results of this project show most participating patients (62%) were in the pre-contemplation stage of change theory with a readiness score of 8 or less. The second highest category was the contemplation stage, where 35% of participating

patients had a readiness score between 9 and 11. These two categories account for 97% of screening participants. The mean BMI for screened patients was 40.4 kg/m<sup>2</sup>. Establishing a patient's readiness to change can greatly increase the effectiveness of provider education and intervention by allowing HCPs to individualize education and treatment to the specific needs of the patient. This DNP project demonstrates the need to determine readiness to change. Healthcare providers and other professionals can and should collaborate to reduce the prevalence of overweight and obesity. This endeavor begins with determining the patient's readiness to change and meeting the patient at their stage of change and point of need. Implementation of the URICA tool (DiClemente & Hughes, 1990) into the clinical practice setting can help guide HCPs in providing individualized care. Initiating the previously mentioned assessments along with development and implementation of the continuing education modules and programs mentioned can contribute in the efforts to slow and reverse the current rise of overweight and obesity in MS.

## APPENDIX A – IRB Approval Form

Office of  
Research Integrity



118 COLLEGE DRIVE #5125 • HATTIESBURG, MS | 601.266.6576 | USM.EDU/ORI

### NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-19-59

PROJECT TITLE: Implementing Screening to Assess Readiness to Change in Overweight and Obese Patients at a Patient-Centered Medical Home

SCHOOL/PROGRAM: School of LANP

RESEARCHER(S): Jarrod Gant, Cathy Hughes

IRB COMMITTEE ACTION: Exempt

CATEGORY: Exempt

Category 2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless: (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

APPROVED STARTING: June 12, 2019

A handwritten signature in cursive script that reads "Donald Sacco".

Donald Sacco, Ph.D.

APPENDIX B – University of Rhode Island Change Assessment Tool (URICA)

Age: \_\_\_\_\_ Sex: \_\_\_\_\_ Race: \_\_\_\_\_  
 Height: \_\_\_\_\_ Weight: \_\_\_\_\_ BMI: \_\_\_\_\_

**University of Rhode Island Change Assessment Scale**

**(URICA)**

Each statement below describes how a person might feel when starting therapy or approaching problems in his life. Please indicate the extent to which you tend to agree or disagree with each statement. In each case, make your choice in terms of how you feel right now, not what you have felt in the past or would like to feel. For all the statements that refer to your “problem,” answer in terms of problems related to your weight.

There are five possible responses to each of the items in the questionnaire:

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Undecided
- 4 = Agree
- 5 = Strongly Agree

**Instructions:** Circle the number that best describes how much you agree or disagree with each statement.

	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
1. As far as I’m concerned, I don’t have any problems that need changing.					
2. I think I might be ready for some self-improvement.					
3. I am doing something about the problems that had been bothering me.					
4. It might be worthwhile to work on my problem.					
5. I’m not the problem one. It doesn’t make					

much sense for me to consider changing.					
6. It worries me that I might slip back on a problem I have already changed, so I am looking for help.					
7. I am finally doing some work on my problem.					
8. I've been thinking that I might want to change something about myself.					
	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
9. I have been successful in working on my problem, but I'm not sure I can keep up the effort on my own.					
10. At times my problem is difficult, but I'm working on it.					
11. Trying to change is pretty much a waste of time for me because the problem doesn't have to do with me.					
12. I'm hoping that I will be able to understand myself better.					
13. I guess I have faults, but there's nothing that I really need to change.					
14. I am really working hard to change.					
15. I have a problem, and I really think I should work on it.					
16. I'm not following through with what I had already changed as well as I had hoped, and I want to prevent a relapse of the problem.					
17. Even though I'm not always successful in changing, I am at least working on my problem.					
18. I thought once I had resolved the problem, I					

would be free of it, but sometimes I still find myself struggling with it.					
19. I wish I had more ideas on how to solve my problem.					
20. I have started working on my problem, but I would like help.					
21. Maybe someone or something will be able to help me.					
	Strongly Disagree (1)	Disagree (2)	Undecided (3)	Agree (4)	Strongly Agree (5)
22. I may need a boost right now to help me maintain the changes I've already made.					
23. I may be part of the problem, but I don't really think I am.					
24. I hope that someone will have some good advice for me.					
25. Anyone can talk about changing; I'm actually doing something about it.					
26. All this talk about psychology is boring. Why can't people just forget about their problems?					
27. I'm struggling to prevent myself from having a relapse of my problem.					
28. It is frustrating, but I feel I might be having a recurrence of a problem I thought I had resolved.					
29. I have worries, but so does the next guy. Why spend time thinking about them?					
30. I am actively working on my problem.					
31. I would rather cope with my faults than try to change them.					

32. After all I had done to try and change my problem, every now and then it comes back to haunt me.					
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Reference:

DiClemente, C.C. & Hughes, S.O. (1990). Stages of change profiles in alcoholism treatment. *Journal of Substance Abuse*, 2, 217-235.

## How Do I Follow a Healthy Diet?

The American Heart Association recommends an eating plan that emphasizes intake of vegetables, fruits, and whole grains and includes low-fat dairy products, poultry, fish, legumes (dried beans and peas), nontropical vegetable oils, nuts and seeds. It should limit intake of sodium, sweets, sugar-sweetened beverages and red meats.



### Vegetables

- One serving equals: 1 cup raw leafy vegetables (about the size of a small fist); ½ cup cut-up raw or cooked vegetables; ½ cup vegetable juice.
- Eat a variety of colors and types, especially deeply colored vegetables, such as spinach, carrots, and broccoli.
- Look for vegetables that are fresh, frozen, or canned in water without added sugar, saturated and *trans* fats, or salt.

### Fruits

- One serving equals: 1 medium fruit (about the size of a baseball); ¼ cup dried fruit; ½ cup fresh, frozen, or canned fruit; ½ cup 100% fruit juice.
- Eat a variety of colors and types, especially deeply colored fruits such as peaches and berries.
- Eat whole fruits to get all of the nutrients (such as fiber) that can be missing in some juices.

### Whole grains

- One serving equals: 1 slice bread; ½ cup hot cereal, 1 cup flaked cereal; or ½ cup cooked rice or pasta (about the size of a baseball).
- At least half of your servings should be high-fiber whole grains. Select items like whole-wheat bread, whole-grain crackers and brown rice.
- Aim for about 25-30 grams of fiber from foods each day.

### Poultry, fish and lean meats (less than 6 cooked ounces per day)

- A 3 oz. portion is about the size of a deck of playing cards, ½ of a chicken breast or ¾ cup of flaked fish.
- Enjoy at least 2 servings of baked or grilled fish each week; especially fish high in omega-3 fatty acids, like salmon, trout, and herring. (3 oz. of grilled or baked fish is about the size of a checkbook).
- Trim all visible fat from meats before cooking.
- Remove skin from poultry before eating.

(continued)





#### Nuts, seeds, and legumes

- One serving equals:  $\frac{1}{3}$  cup or  $1\frac{1}{2}$  oz nuts; 2 Tbsp. peanut butter (no salt added); 2 Tbsp. or  $\frac{1}{2}$  oz seeds;  $\frac{1}{2}$  cup cooked legumes (dried beans or peas).
- Add beans to your soups, salads, and pasta dishes.
- Try unsalted nuts in your salads, stir-fries, or stirred into yogurt.

#### Low-fat dairy products

- One serving equals: 1 cup milk or yogurt or  $1\frac{1}{2}$  oz. low sodium, fat-free or low-fat cheese (about the size of 6 stacked dice).
- Use only milk products with 0% to 1% fat. 2% milk is not low-fat.
- Have only fat-free or low-fat yogurt with no added sugars.
- Use dry-curd, fat-free or low-fat cottage cheese.
- Cheeses (low-sodium, fat-free or low-fat) should have no more than 3 grams of fat per oz. and no more than 2 grams of saturated fat per oz.



#### HOW CAN I LEARN MORE?

- 1 Call 1-800-AHA-USA1 (1-800-242-8721), or visit [heart.org](http://heart.org) to learn more about heart disease and stroke.
- 2 Sign up to get *Heart Insight*, a free magazine for heart patients and their families, at [heartinsight.org](http://heartinsight.org).
- 3 Connect with others sharing similar journeys with heart disease and stroke by joining our Support Network at [heart.org/supportnetwork](http://heart.org/supportnetwork).

#### Do you have questions for the doctor or nurse?

Take a few minutes to write your questions for the next time you see your healthcare provider.  
For example:

- How many calories should I eat each day?**
- What's a good, healthy cookbook?**

#### My Questions:

We have many other fact sheets to help you make healthier choices to reduce your risk, manage disease or care for a loved one. Visit [heart.org/answersbyheart](http://heart.org/answersbyheart) to learn more.



©2015, American Heart Association

Reference:

American Heart Association. (2015). *How do I follow a healthy diet?* Retrieved from [https://www.heart.org/-/media/data-import/downloadables/pe-abh-how-do-i-follow-a-healthy-diet-ucm\\_300467.pdf](https://www.heart.org/-/media/data-import/downloadables/pe-abh-how-do-i-follow-a-healthy-diet-ucm_300467.pdf)

## You Have **Control**

Physical inactivity is one of several major risk factors for heart disease that you can do something about. The other major risk factors are:

**Smoking.** People who smoke are up to six times more likely to have a heart attack than nonsmokers. Check with local community groups for free or low-cost programs designed to help people stop smoking.

**High blood pressure increases your risk of heart disease, stroke, and other conditions.** It can be controlled by getting regular physical activity, losing excess weight, cutting down on alcohol, and changing eating habits, such as using less salt and other forms of sodium. For some people, medication is also needed.

**High blood cholesterol** can lead to a buildup of plaque in your arteries, which raises your risk for a heart attack. You can lower high blood cholesterol by getting regular physical activity, eating less saturated fat and *trans* fat, and managing your weight. For some people, medication is also needed.

**Overweight.** If you're overweight or obese, you're more likely to develop heart disease even if you have no other risk factors. However, there is good news: Losing just 5–10 percent of your current weight will help to lower your risk for heart disease and many other medical disorders.

**Type 2 diabetes** greatly increases your risk for heart disease, stroke, and other serious diseases. Ask your health care provider whether you should be tested for diabetes. Many people at high risk for diabetes can prevent or delay the disease by reducing calories as part of a healthy eating plan and by becoming more physically active.

things, such as taking a walk or climbing steps. But it's important to know that you have a lot of power to protect your heart health. Getting regular physical activity is especially important because it directly reduces your heart disease risk *and* your chances of developing other risk factors for heart disease. Physical activity can also protect your heart by helping to prevent and control diabetes. Finally, physical activity can help you to lose excess weight or to stay at a healthy weight, which will also help to lower your risk of heart disease.

### The Benefits Keep Coming

In addition to protecting your heart, staying active:

- May help to prevent cancers of the breast, uterus, and colon
- Strengthens your lungs and helps them to work more efficiently
- Tones and strengthens your muscles
- Builds your stamina
- Keeps your joints in good condition
- Improves your balance
- May slow bone loss

Regular physical activity can also boost the way you feel. It may:

- Give you more energy
- Help you to relax, cope better with stress, and beat the blues
- Build your confidence
- Allow you to fall asleep more quickly and sleep more soundly
- Provide you with an enjoyable way to share time with friends or family

### Physical Activity: The Calorie Connection

One way that regular physical activity protects against heart disease is by burning extra calories, which can help you to lose excess weight or stay at your healthy weight. To understand how physical activity affects calories, it's helpful to consider the concept of "energy balance." Energy balance is the amount of calories you take in relative to the amount of calories you burn. If you need to lose weight for your health, eating fewer calories and being more active is the best approach. You're more likely to be successful by combining a healthful, lower calorie diet with physical activity. For example, a 200-pound person who consumes 250 fewer

# Go for the Burn!

Some physical activities burn more calories than others. Below is the average number of calories a 154-pound person will burn, per hour, for a variety of activities. (A lighter person will burn fewer

calories; a heavier person will burn more.) As you can see, vigorous-intensity activities burn more calories than moderate-intensity activities.

Moderate-Intensity Physical Activity	Calories Burned per Hour	Vigorous-Intensity Physical Activity	Calories Burned per Hour
Hiking	370	Running/jogging; bicycling (more than 10 mph)	590
Light gardening/ yard work	330	Swimming (slow freestyle laps)	510
Dancing; golf (walking and carrying clubs)	330	Aerobics	480
Bicycling (less than 10 mph)	290	Walking (4.5 mph)	460
Walking (3.5 mph)	280	Heavy yard work (chopping wood, for example)	440
Weight lifting (light workout)	220	Weight lifting (vigorous workout)	440
Stretching	180		



If you are just starting or significantly increasing your physical activity, take proper precautions and check with your doctor first.

Source: Adapted from the 2005 Dietary Guidelines Advisory Committee Report

calories per day and walks briskly each day for 1½ miles will lose about 40 pounds in 1 year. Most of the energy you burn each day—about three-quarters of it—goes to activities that your body automatically engages in for survival, such as breathing, sleeping, and digesting food. The part of your energy output that *you* control is daily physical activity. Any activity you take part in beyond your body's automatic activities will burn extra calories. Even seated activities, such as using the computer or watching TV, will burn calories—but only a very small number. That's why it's important to make time each day for moderate-to vigorous-intensity physical activity.

## Great Moves

Given the numerous benefits of regular physical activity, you may be ready to get in motion! Three types of activity are important for a complete physical activity program: aerobic activity, resistance training, and flexibility exercises.

## Types of Physical Activity

**Aerobic activity** is any physical activity that uses large muscle groups and causes your body to use more oxygen than it would while resting. Aerobic activity is the type of movement that most benefits the heart.

Examples of aerobic activity are brisk walking, jogging, and bicycling. If you're just starting to be active, try brisk walking for short periods such as 5 or 10 minutes, and build up gradually to 30 to 60 minutes at least 5 days per week. Always start with a 5-minute, slower paced walk to warm up, and end with a 5-minute, slower paced walk to cool down.

**Resistance training**—also called strength training—can firm, strengthen, and tone your muscles, as well as improve bone strength, balance, and coordination. Examples of resistance training are pushups, lunges, and bicep curls using dumbbells.

**Flexibility exercises** stretch and lengthen your muscles. These activities help improve joint flexibility and keep muscles limber, thereby preventing injury. An example of a flexibility exercise is sitting cross-legged on the floor and gently pushing down on the tops of your legs to stretch the inner-thigh muscles.

### Family Fitness

When it comes to getting in shape, what's good for you is good for your whole family. Children and teenagers should be physically active for at least 60 minutes per day. A great way to pry kids off the couch—and help you to stay fit as well—is to do enjoyable activities together. Some ideas include:

- **Kick up your heels.** Take turns picking out your favorite music, and dance up a storm in the living room.
- **Explore the out doors.** Hit your local trail on weekends for some biking or hiking. Pack a healthy lunch, and let the kids choose the picnic spot.
- **Get classy.** Join family members in an active class, such as martial arts, yoga, or aerobics.
- **Play pupil.** Ask one of your children or grandchildren to teach you an active game or sport. Kids love to be the experts, and you'll get a work out learning a new activity!
- **Use online resources.** Check out the We Can! Web site at <http://wecan.nhlbi.nih.gov>. You'll find more family-friendly ideas for making smart food choices, increasing physical activity, and reducing "screen time" in front of the TV and other electronic attractions.

4

## Creating Opportunities

It's easier to stay physically active over time if you take advantage of everyday opportunities to move around. For example:

- Use the stairs—both up and down—instead of the elevator. Start with one flight of stairs and gradually build up to more.
- Park a few blocks from the office or store and walk the rest of the way. If you take public transportation, get off a stop or two early and walk a few blocks.
- While working, take frequent activity breaks. Get up and stretch, walk around, and give your muscles and mind a chance to relax.
- Instead of eating that extra snack, take a brisk stroll around the neighborhood or your office building.
- Do housework, gardening, or yard work at a more vigorous pace.
- When you travel, walk around the train station, bus station, or airport rather than sitting and waiting.

### To Learn More

Contact the National Heart, Lung, and Blood Institute (NHLBI) for information on physical activity, heart disease, and heart health.

NHLBI Health Information Center  
P.O. Box 30105  
Bethesda, MD 20824-0105  
Phone: 301-592-8573  
TTY: 240-629-3255  
Fax: 301-592-8563  
[www.nhlbi.nih.gov](http://www.nhlbi.nih.gov)



U.S. Department of Health and Human Services  
National Institutes of Health



National Heart  
Lung and Blood Institute  
People Science Health

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