# 2017 Obesity Clinical Practice Guidelines Update for Healthcare Providers Managing Obesity in Mississippi

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## Abstract

One can observe the prevalence of obesity merely by walking down the street in any given Mississippi town or city. The Centers for Disease Control and Prevention (CDC) rank the national annualized obesity rate for the years 2011-2014 at 28.3 percent (U. S. Department of Health and Human Services, 2016). According to The State of Obesity (2016a), four states in the United States (U. S.) had adult obesity rates above 35%. One of those states was Mississippi at 35.6%, tying in second place for the most cases of adult obesity in the nation.

As rates of obesity continue to rise, it is the responsibility of healthcare providers to analyze what methods are in use to combat this epidemic disease. In reviewing practices, perhaps we as healthcare providers can formulate plans of how to change practice and effectively reverse this trend. However, a thorough knowledge of current recommendations is required. Understanding evidence-based guidelines can bolster provider confidence to align practice patterns more with the current guidelines.

The purpose of this scholarly project was to increase provider knowledge level and confidence in using the 2013 adult obesity guidelines. The study design was a quantitative, quasi-experimental, descriptive approach. Seventeen healthcare providers consisting of nurse practitioners (NP) and NP students were included in the sample. The setting was a School of Nursing in a rural University town in Mississippi.

Pre and posttests were used to assess provider practice patterns, and confidence levels were administered prior to and approximately two weeks after the intervention. All data was analyzed using SPSS. Provider awareness of NHLBI and AHA/ACC/TOS guidelines as well as utilization of the AHA/ACC/TOS and AACE/ACE guidelines was significantly higher on the post-test. Additionally, participants reported a significantly higher level of agreement with feeling well-educated on overweight and obesity management on the posttest. These findings

indicate an increase in confidence and alignment with current clinical practice guidelines. Limitations of the study included short timeframe from intervention to posttest, recruitment methods, and small sample size. Further research should be done with larger samples. Additionally, more research utilizing methodologies other than self-report should be conducted in the Mississippi delta. This research should impress the importance of education regarding obesity management techniques in nurse practitioner programs on educators. Additionally, providers should take it upon themselves to critically appraise their practices in managing overweight and obese patients. Only when we understand exactly what is not working, or we are not doing can we change the rising rates of obesity.

## 2017 Obesity Clinical Practice Guidelines Update for Healthcare Providers Managing Obesity in Mississippi

One can observe the prevalence of obesity merely by walking down the street in any given Mississippi town or city. The Centers for Disease Control and Prevention (CDC) rank the national annualized obesity rate for the years 2011-2014 at 28.3 percent (U. S. Department of Health and Human Services, 2016). According to The State of Obesity (2016a), four states in the United States (U. S.) had adult obesity rates above 35%. One of those states was Mississippi at 35.6%, tying in second place for the most cases of adult obesity in the nation. The other number two ranked states were Alabama and West Virginia. Of Mississippi's citizens, 31.9% of men and 37.4% of women were obese in 2012 (The State of Obesity, 2016c). Trending data shows that obesity rates have skyrocketed from around 15% in 1990 to the current rate of 35.6%. The delta counties have some of the highest obesity rates in the state, with Coahoma, Holmes, Humphreys, Leflore, Quitman, Sunflower, Tunica and Washington counties having rates above 40% (County Health Rankings, 2016). Bolivar County is among the delta counties with the lowest obesity rates at 34%. Obesity rates are rising in children as well. The CDC reports that the national obesity rate in children ages six to 11 increased from 7% in 1980 to approximately 18% in 2012 (CDC, 2015). In the same timespan, the rate in children aged 12 to 19 increased from 5% to 21%. A positive within the state of Mississippi, the obesity rate for two to four-year-olds from low-income families was 13.9% in 2011, a significant decrease from 14.6% in 2008 (The State of Obesity, 2016c). The state also ranks first in childhood obesity for children aged 10 to 17 and high school students, 21.7% and 18.9% respectively. In 2010, Bolivar County had a 15.1% obesity rate among low-income preschoolers (National Institute for Children's Health Quality, 2016). County-level obesity rates for other childhood age groups were not found. The childhood obesity statistics are very ominous. Obese children grow up to be obese adults. The long-term

outlook for children living with this chronic disease and the complications that go hand-in-hand with it are frightening. Incidence rates of obesity-related health problems such as diabetes, hypertension, heart disease and cancer have risen along with the obesity rates (Hurt, Kulisek, Buchanan & McClave, 2010).

The economic impact of obesity is astounding. According to data from The State of Obesity 2016, the estimates of the healthcare costs associated with obesity in the United States range from 147 to 210 billion dollars annually (The State of Obesity, 2016b). Other economic factors associated with obesity that burden the country include absenteeism and low productivity, with an estimated cost of 4.3 billion and 506 dollars per obese worker per year respectively.

**Project**

When looking at the ever-increasing national and state obesity rates, the question becomes 'What are healthcare providers doing to curtail this epidemic?'. In 2011, Bleich, Pickett-Blakely and Cooper found that only one-third of obese adults received the diagnosis of obesity in their office visit (N=2458). The findings also show that only one-fifth actually had any treatment for weight reduction, including discussions about diet and/or exercise. Foster, Wadden, Makris, Davidson, Sanderson, Allisson and Kessler (2003) found that primary care physicians (N=2500) believed treatment for obesity was substantially less successful than treatment for nine other chronic conditions. Additionally, over half of these physicians reported that they would spend more time with obesity and weight management issues if reimbursement for their time was adequate. Providers have also reported insufficient skills with counseling as barriers to implementing obesity guidelines (Sinfield, Baker, Pollard & Tang, 2013).

Obesity has historically not been considered a disease; therefore, providers had to code for treatment of obesity-related health problems. In 2012, however, the Center for Medicare and

Medicaid Services (CMS) made intensive behavioral therapy for obesity reimbursable (Center for Medicare & Medicaid Services, 2012). Individuals with obesity receiving Medicare can now qualify for up to twenty-two visits in a twelve-month period. The reimbursement rate is still considered low at $26 for a fifteen-minute visit, but it is a beginning.

## Internal Data

National, state, and county initiatives have recognized the need to increase healthcare provider assessment and treatment of obesity (Healthy People 2020, 2014; Mississippi State Department of Health, 2015). According to Hurt, Kullisek, Buchanan and McClave (2010), many believe obesity has become a bigger public health threat than smoking. Public health initiatives have dramatically changed the culture in the United States, certainly in the state of Mississippi with regard to smoking. The cultural norm in the 1990s involved smoking in bars, restaurants, and just walking around on the streets in Mississippi. Today, it is very unusual to be walking down the street and catch the scent of a cigarette. Most bars and restaurants do not allow smoking, and if they do, it is certainly contained away from the rest of the public. This transition shows the difference well-planned public health initiatives can make. Developing similar initiatives to address obesity may be a viable strategy to reduce obesity rates.

### National.

Healthy People 2020 (2014) has several objectives toward this end. Objective NWS-5 is to "Increase the proportion of primary care physicians who regularly measure body mass index of their patients" (para. #2). Objective NWS-6.2 calls for an "Increase in the proportion of physician office visits made by adult patients who are obese that include counseling or education related to weight reduction, nutrition, or physical activity" (para. #2).

Updated guidelines for the management of obesity were released in 2013, and most recently in 2016 (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014; American Association of Clinical Endocrinologists and American College of Endocrinology, 2016). These guidelines offer providers an in-depth algorithm for treating obesity as a chronic disease, and include behavior modification, pharmaceutical and surgical treatments.

In 2013, The American Nurse Practitioner Foundation (ANPF) released a white paper describing recommendations for nurse practitioners in the treatment of obesity in adults (ANPF, 2013). In this paper, ten steps are outlined for nurse practitioners to use in assessing and treating obesity. The steps include assessing the patient's readiness and motivation to change, personalized diet recommendations, setting goals with the patients, and a regular follow-up schedule in two to four week increments. These steps are of vital importance, promoting behavior change, which is at the core of weight loss.

Nationally, a number of organizations exist with the sole purpose of creating forums for leaders and policymakers to discuss ways to prevent and adequately treat obesity. The Strategies to Overcome and Prevent (STOP) Obesity Alliance (STOP Obesity Alliance, n.d.) is one such organization. The website for the organization contains a number of resources for providers to use when talking to patients, but no actual examples of policy change are available. Additionally, it is noted that funding sources for the alliance include a number of pharmaceutical companies and big-name weight loss companies. One could infer that materials could be biased in their favor. Another such organization is the Campaign to End Obesity (Campaign to End Obesity, 2014). This organization's website contains much news about obesity in America, as well as a list of obesity and weight related legislation passed nationally. Other national initiatives include

Partnership for a Healthier America (Partnership for a Healthier America, n. d.), and Let's Move! (Let's Move, n.d.). Both initiatives are focused on creating healthier habits in children through increased physical activity and consumption of healthier foods.

A number of new initiatives were established in New York focusing on decreasing obesity rates (Hurt, Kullisek, Buchanan & McClave, 2010). Firstly, empowering the public to make more informed decisions, fast food companies have been required to label all foods with nutrition facts in New York City. Essentially all artificial trans fats had to be removed from their foods by 2007 based on a proposal by the Department of Health and Mental Hygiene. The city has also placed a tax penalty on non-diet sodas. The bold steps are isolated to one city; however, the steps indicate the beginning of a change in culture. This is exactly how the anti-smoking initiatives began.

**State.**

The state of Mississippi has also begun a number of initiatives to address the problem of obesity in the development of the 2015 Obesity Action Plan (The Mississippi State Department of Health [MSDH], 2015). The plan calls for changes in the healthcare system with regard to the treatment of obesity. Goal four in the plan is to "Increase support for the promotion of healthy eating and physical activity within Mississippi's health care system and among health care professionals" (p. 13). The plan's strategy for meeting this goal is to educate providers about obesity in order to recognize, prevent and treat obesity. The call for providers to adopt current national clinical practice guidelines is an initiative that can be led by nurse practitioners in the state.

A number of other initiatives are in place within the state, such as the Partnership for a Healthy Mississippi (Robert Wood Johnson Foundation, 2015). A Mississippi Grocery Access

Task force composed of the National Grocers Association and The Food Trust to has been established through this initiative to address a lack of markets offering healthy affordable foods within the state. Additionally, the Just Have a Ball program in elementary schools. This program sponsors interactive assemblies about the importance of being active and eating a healthy diet. All participants are also given a ball to encourage activity. The state set nutrition standards in 2006 to encourage healthier food in school vending machines. In 2010, the state became involved in the Safe Routes to School National Partnership's State Network Project designed to aid in attaining funding to make streets and sidewalks safe for walking and bicycling. Finally, the Move to Learn program was implemented, encouraging teachers to incorporate short activity breaks in their classrooms. During these breaks, the teachers lead the students in some form of physical activity.

The state legislature has also been involved in the battle to combat obesity, passing the Healthy Students Act in 2007 (Robert Wood Johnson Foundation, 2015). This piece of legislation set very specific standards for physical education and health education in schools in the state. It also set wellness policies, and guidelines for school meals, snacks and drinks. All of the aforementioned activities have resulted in an 11.6% decline in overweight and obese elementary age children in Mississippi from 2007 to 2013.

The Mississippi State Department of Health has joined the Take Charge of Your Health Initiative (Mississippi State Department of Health, n.d.). The initiative has a website that contains a number of tools and resources for the state's citizens to use in aiding weight loss efforts. Overall, the state needs more initiatives targeting overweight and obese adults.

**County.**

Bolivar County has benefitted from the Delta Fresh Foods Initiative funded through Project Change, a project of My Brother's Keeper, Inc. (My Brother's Keeper 2011). Through the Farm to School Project, students in Bolivar County have benefitted from having food options in school of locally grown fruits and vegetables. The project has helped in the development of local farmer's markets through the Delta Regional Farmers' Market Alliance. The county also has been involved in the Eating Good and Moving Like We Should initiative supported by the Delta Health Alliance and The University of Mississippi (The University of Mississippi, 2016). This program educates teachers how to incorporate activity into classrooms, educating food workers in school systems on nutrition, and creating weight-loss programs in the community. Again, most of the initiatives seem to address childhood obesity, preventing them from growing up to be obese adults. The obese adults have few resources from which to draw aid.

**Local.**

On the local level, the most outstanding initiative to combat obesity has been the Healthy Campus/Community Initiative led by the College of Education at Delta State University (Delta State University, 2016). This initiative has touched the campus as well as the local community of Cleveland. Through the project, a well-lit walking track was built on the campus and is open to the public at all times of the day and night. Additionally, the public elementary schools in Cleveland received Project Fit America activity equipment. Biometric screenings are offered to students and faculty members at the beginning and end of the fall semester. Education and support resources regarding health were provided for local educators. The initiative has a number of additional programs. A Delta Health and Wellness day on Delta State's main campus each year, offering screening and educational services to all age groups. OKRA Camp is held during

the summers for school-aged kids to offer a variety of recreational programs for kids. A number of other recreational programs are offered through this initiative.

The Delta Healthy Families Grant awarded to Delta State University Robert E. Smith School of Nursing has enabled the development of a Healthy Lifestyle Center in Cleveland, Mississippi. The center focuses on preventive types of care. Care provided helps patients meet their own healthcare goals through behavior-change.

**External Data**

In analyzing provider knowledge of and confidence using the adult obesity treatment guidelines in Mississippi, one needs to know more about the provider population on the national, state, and local level.

**National.**

In 2016, the Kaiser Family Foundation gathered statistics on the number of healthcare providers in the country (Kaiser Family Foundation, 2016b). The number of professionally active primary care providers in the country is 1, 175, 523. This number includes 91, 994 physician's assistants (PAs), 17, 021 nurse practitioners (NPs) and 908,508 physicians. Using these numbers, the Foundation calculated that nationally, 57.81 percent of the need for providers is met, based on a patient-to-provider ratio of 3, 500 to 1. The foundation also found the percent of overweight or obese adults treated by providers to be 64.1% (Kaiser Family Foundation, 2016a). The statistics infer that providers, who are already operating in numbers well below what is needed, are trying to manage individuals who have health issues complicated by their weight status. To provide optimal care, the providers must treat not only the health issue bringing the patient in to the healthcare facility, but also the obesity and any possible chronic problems that accompany the diagnosis.

### State.

In 2016, the Kaiser Family Foundation gathered statistics on the number of healthcare providers in the state of Mississippi as well (Kaiser Family Foundation, 2016b). The providers in the state consisted of 5,992 physicians, 2,235 NPs, and 103 PAs, with a grand total of 8,330 healthcare providers. Using these numbers, the Foundation calculated 59.21 percent of the need for providers is met. This is slightly better than the national percentage of need met. The foundation found the percent of overweight or obese adults treated by providers in the state of Mississippi to be 70.7% (Kaiser Family Foundation, 2016a), substantially higher than the national percentage.

### Local.

Although the Mississippi delta contains some of the fattest counties in one of the three second fattest states in the nation, Bolivar County itself has one of the lower percentages of obesity in the state at 34% (County Health Rankings & Roadmaps, 2016). However, the overall health ranking of Bolivar County within the state's 82 counties is 76$^{th}$. Statistics show Bolivar County has an acceptable patient-to-healthcare provider ratio, at 1890:1 for primary care physicians, and 1351:1 for other primary care providers.

## Problem Statement

In order for providers to adopt current guidelines, a thorough knowledge of current recommendations is required. Understanding evidence-based guidelines can bolster provider confidence in treatment and align practice patterns more with the current guidelines. Research on the efficacy of educational interventions on changes in practice has been mixed. A recent study by Barnes, Theeke and Mallow (2014) found that educational sessions did not have any impact on aligning practice patterns with obesity treatment guidelines. Alternatively, Farran, Ellis and

Barron (2013) found significant improvement in documentation of body mass index, height, diagnosis and counseling with regard to BMI following an educational intervention.

**Research questions.**

The purpose of this scholarly project was to increase provider knowledge level of and confidence in using the 2016 adult obesity guidelines and to increase the number of patients treated according to these guidelines. The first research question was: Will healthcare providers' confidence in management of adult obese patients according to the obesity clinical practice guidelines significantly two weeks after attending a one-day conference? The second question was: Will healthcare providers' practice patterns align significantly more with the adult obesity clinical practice guidelines two weeks after attending a one-day conference?

**Goals and objectives.**

The first goal of the project was that healthcare providers would have significantly improved confidence levels in the management of adult obese patients according to the clinical practice guidelines one month after attending a one-day conference. The objectives for this project were:

- 100% of participants will complete the *2016 Obesity Management Patterns in Mississippi* pre-test prior to the conference.
- Thirty-five to 50 healthcare providers will take part in a day-long conference, which will familiarize them with current clinical practice guidelines for the management of adult obesity.
- Conference participants will be made aware that continuing education documentation will be held until the post-test(s) are received by the researcher.

- Contact information will be collected from all participants including email and standard mailing address.
- The 2016 *Obesity Management Patterns in Mississippi* post-test will be sent to all participants who completed the conference four weeks after the conference by email to those who provided email addresses and by standard mail for those who did not list email addresses.
- The final *2016 Obesity Management Patterns in Mississippi* post-test will be sent to all participants who completed the conference six weeks after the conference by email to those who provided email addresses and by standard mail for those who did not list email addresses.
- The total response rate of the post-test will be 60%.

The final goal of the project was that healthcare providers' practice patterns would be significantly more aligned with the adult obesity clinical practice guidelines two weeks after attending a one-day conference. The objectives for this project were:

- 100% of participants will complete the *2016 Obesity Management Patterns in Mississippi* pre-test prior to the conference.
- Thirty-five to 50 healthcare providers will take part in a day-long conference, which will familiarize them with current clinical practice guidelines for the management of adult obesity.
- Conference participants will be made aware that continuing education documentation will be held until the *2016 Obesity Management Patterns in Mississippi* post-test(s) are received by the researcher.

- Contact information will be collected from all participants including email and standard mailing address.
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- The final *2016 Obesity Management Patterns in Mississippi* post-test will be sent to all participants who completed the conference six weeks after the conference by email to those who provided email addresses and by standard mail for those who did not list email addresses.
- The total response rate of the post-test will be 60%.

**Expected outcomes.**

Upon scoring and statistical analysis of the initial and follow-up survey instruments, a number of outcomes were desired.

- Sixty percent of respondents would report increased confidence levels in management of adult obese patients according to the clinical practice guidelines after attending a one-day conference.
- Sixty percent of respondents would report practice patterns more aligned with the adult obesity clinical practice guidelines after attending a one-day conference.

## Literature Review

As rates of obesity continue to rise, it is the responsibility of healthcare providers to analyze what is being done to combat this epidemic disease. In reviewing practices, perhaps we

as healthcare providers can formulate plans of how to change practice and effectively reverse this trend. My literature search was conducted by using the initial search terms "obesity guidelines" and "provider adherence" to search Academic Search Premier and CINAHL with 11 results only 2 of which dealt with the general adult population. Searching more broadly, with merely "Adult obesity guidelines" resulted in 37 articles, only 2 of which were relevant to the topic at hand. "Obesity treatment" and "adult" and "primary care" searched through all databases in EBSCOhost returned 366 results. Upon viewing titles, less than 5 were relevant to the current study. The first term was changed to "obesity management", with 344 returned results. Scanning the titles revealed 5 usable articles. Identical searches were put into google scholar in the same order. The first search yielded 17 results, with 1 to two relevant studies. The second search yielded 979,000 results. Changing "obesity treatment" to "obesity management" resulted in 2,580 results. The titles of these results were scanned for relevance to the current project. Several articles were additionally obtained by looking up references of the articles pulled from the databases.

**Current Obesity Guidelines**

Prior to the publication of the *2013 AHA/ACC/TOS Guideline for the Management of Overweight and Obesity in Adults* (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014), clinical practice guidelines for the management of the obese adult had not been updated since 1998 in the U. S. The aforementioned bodies conducted a systematic review of the body of evidence with regard to the management of overweight and obesity in adults through the year of 2011, focusing on randomized control trials, meta-analyses, and observational studies. An expert panel created critical questions (CQs), interpreted the evidence and crafted recommendations specifically

related to the critical questions only. The CQs were chosen specifically to aid providers in primary care who often work with obese patients to identify patients at risk for developing weight-related comorbidities and update them on the varying approaches to weight-loss as well as the benefits and risks of each. The clinical questions did not deal with issues of genetic causes of obesity, binge-eating disorders, pharmaceutical management, or cost-effectiveness of interventions. Recommendations were presented in simple format, including a treatment algorithm with boxes for clarification of relevant data.

Recommendations of the guideline were very straightforward (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). Height and weight should be measured, and BMI calculated at least annually. Waist circumference should be measured annually in all patients, more frequently in overweight or obese patients. Current standard cut points are still acceptable for both BMI and waist circumference. Patients considered overweight should be identified as being at increased for CVD, while patients considered obese should be identified as at increased risk for all-cause mortality. Overweigh and obese patients should be educated that the higher the BMI, the higher risk for CVD, type 2 diabetes and all-cause mortality.

The guidelines also recommend that providers educate overweight and obese patients with risk factors for the development of cardiovascular disease that weight loss of 3-5% can have health benefits, with greater losses producing more benefit (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). Triglycerides, blood sugar, glycosylated hemoglobin, and risk for developing diabetes can be meaningfully decreased by maintenance of a weight loss in this range. Higher levels of weight loss can reduce blood pressure, LDL, HDL, and decrease the need for

pharmacotherapy for related diseases. Specific recommendations are given dealing with diets for weight loss. Reduced calorie intake is recommended as part of a comprehensive lifestyle modification. Caloric intake recommendations for women are between 1,200 and 1,500 kcal daily. The recommendation for men is between 1,500 and 1,800 kcal daily. Alternatively, if the daily caloric intake is known, providers can recommend a deficit of 500 to 759 kcal daily. A final alternative for providers is to recommend any of the diets supported by evidence that restricts certain types of foods. This could include low-carbohydrate, high-fiber, or low-fat diets, as all ideally produce a lower food intake overall. Providers are urged to take the patient's preferences and state of health into account, and consider referring to a dietician or nutrition professional.

The guideline describes a number of recommendations for a comprehensive weight loss lifestyle intervention (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). Providers are urged to recommend a >6 month comprehensive lifestyle program to overweight and obese patients to aid in compliance with a low-calorie diet combined with increased levels of physical activity. High-intensity interventions, defined as 14 or more sessions in a six month timeframe, should be provided for the individual or group of individuals by a trained professional. Electronically delivered programs are deemed acceptable, but result in lower levels of weight loss. Commercial-based programs are also deemed acceptable if they are evidence-based programs. Use of very low calorie diets (<800 kcal/d) are only recommended in limited number and require medical monitoring and high-intensity intervention. If patients have lost weight, providers should recommend a long-term (> or = to 1 year) maintenance program. During this maintenance phase, require contact at least monthly with a trained provider who can help patients maintain high

levels of physical activity and diet within calorie range for weight. Patient should also monitor weight regularly, at least weekly.

Bariatric surgery is covered in the guideline with regards to assisting in selecting patients who are candidates for these procedures (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). Adults with BMI greater than or equal to 40 $kg/m^2$ or 35 $kg/m^2$ with comorbidities who have not been successful in weight loss efforts using behavioral treatment may be appropriate candidates for bariatric procedures, and appropriate referrals should be made. Use of prescription weight loss medications has no effect on their candidacy for these procedures. Providers are urged to counsel patients that a number of patient-specific factors affect which procedures may be appropriate for them.

Position statements designating obesity as a chronic disease were released by the American Association of Clinical Endocrinologists (AACE) and the American Medical Association (AMA) in 2012 and 2013 respectively (American Association of Clinical Endocrinologists & American College of Endocrinology, 2016). The most recent set of clinical practice guidelines for the management of overweight and obesity in adults was subsequently published. Nine clinical questions are raised and addressed with 160 specific statements developed in a similar manner to the guidelines previously discussed. The guidelines first urge providers to apply the three phases of chronic disease prevention and treatment to obesity. A variance from the previous guideline discussed is the recommendation that waist circumference should be checked in all patients with BMI<35$kg/m^2$, only recommending this measure in this population. Additionally, specific cutoff points for BMI and waist circumference with regard to ethnicity are given. The relationships between obesity and 15 other chronic diseases are

analyzed, with specific recommendations for each disease with regard to obesity and optimal treatments for the presence of the combination of disorders present. Weight-loss recommendations to treat the disorders generally ranges between 5 and 10%. This set of guidelines also recommends structured lifestyle changes, and reducing caloric intake as the main component of weight-loss interventions. Patients are to be considered to optimize adherence to the interventions. Activity recommendations are a total of 150 minutes or more a week divided between three to five days. Resistance training should be urged 2-3 days per week in this population to help preserve muscle mass. Pharmacotherapy is only warranted in conjunction with lifestyle therapy. Pharmacotherapy does increase greater weight loss and maintenance of the loss, but should be considered a long-term part of treatment. This form of treatment is highly individualized. The guideline also recommends lifestyle behavioral therapy conducted by a multidisciplinary team.

Due to the escalating obesity epidemic, the American Nurse Practitioner Foundation held a meeting in January of 2013 to discuss obesity management strategies readily implementable in nurse practitioner (NP) practice (American Nurse Practitioner Foundation, 2013). A White Paper was published, outlining recommendations by the Foundation. The paper outlines strategies providers can utilize to start a discussion about weight with patients in a nonoffensive manner, assessment methods to measure the patient's motivation to change behaviors, and motivating the patient through goal-setting. The paper describes setting long and short term goals, with short-term focusing on diet and physical activity goals. The importance of referrals and regular follow-up are also stressed. Pharmacological approaches are discussed briefly, with the idea being stressed that they should only be used as an adjunct to lifestyle modification.

**Summary and limitations.**

A number of relevant clinical practice guidelines exist. Some are more detailed than others, but for the most part all agree on the cut points for the diagnosis of overweight and obesity, and the primary treatment strategy being lifestyle modification. The White Paper was published in 2013, and many of the recommendations are based on the National Institutes of Health clinical practice guideline from 1998 (American Nurse Practitioner Foundation, 2013). It is the only guideline specifically developed by a national nurse practitioner association. The guidelines developed by the endocrinologist societies are a bit difficult to follow, and have a lot of depth with regard to specific treatments of combinations of disorders. However, the AHA guidelines do not consider pharmacotherapy at all, which can be a very beneficial addition to management of the disorder.

## Provider Practice Patterns

Clinical practice guidelines exist to afford healthcare providers with clear evidence-based management strategies for care of certain populations. In reviewing the literature with regard to provider management of the adult overweight and obese patient, an excellent starting place is how well the care being provided aligns with these practice guidelines. Antognoli, Smith, Mason, Milliner, Davis, Harris-Haywood, Seeholzer, Smith and Flocke (2014) found in a descriptive study of 544 overweight and obese adult patients of 28 primary care physicians in Ohio that overall adherence to the United States (US) National Heart, Lung and Blood Institute (NHLBI) clinical practice guidelines for the management of overweight and obesity in adults was poor. In this descriptive study, patients consecutively scheduled to be seen by physicians on a given day were invited to participate in the study. Participants were contacted by telephone and completed a short questionnaire before their visit. The visit was then directly observed and audio

recorded. The researchers found that only 50% of the visits included some discussion about weight. At least one of the NHLBI assessment elements (body mass index [BMI] reported to patient, waist circumference measured, discussion of health risk status, or assessment of patient's motivation to lose weight) was included in about 47% of visits. Discussions with regard to at least one treatment element of the NHLBI guidelines (setting specific weight loss goals, discussion of diet, discussion of exercise, recommendation of behavioral therapy methods, pharmacotherapy, or discussions about surgery) were less frequent, occurring in only 38% of visits. Additionally, only 35% of visits included both an assessment and a treatment strategy. None of the office visits in the study included all of the NHLBI-recommended elements. Of particular concern was the finding of very low rates of reporting BMI to the patient (2%), measuring waist circumference (1%) and setting realistic weight-loss goals (6%).

In 2008, Kenefick, Lee and Fleishman sought to investigate where the gaps were in clinical practice between the care recommended in the clinical practice guidelines and actual care provided by physicians in a descriptive survey of 231 physicians. The nationwide sample included primary care providers and specialists who has been in practice for at least two years. The physicians had to work in an office or clinic not affiliated with an integrated health system. They received an honorarium for their participation. The researchers found that use of clinical practice guidelines did not significantly vary by age of the provider; with 36% of younger physicians compared to 25% of older physicians considering themselves heavy users of clinical practice guidelines. Additionally, the researchers found that most physicians considered themselves "'light'" (p. 7) users of guidelines. Sixty-four percent of those aged 40 or below and 75 percent of those over 40 reported this.

Several studies have found that educational-type interventions can improve provider alignment of practice patterns with clinical practice guidelines (Barnes, Theeke, & Mallow, 2015; Farran, Ellis & Barron, 2013; Schuster, Tasosa & Terwood, 2008). In a translational experimental research study, Schuster, Tasosa and Terwood (2008) found that 53% of physicians initially uncomfortable discussing obesity with their patients decreased to 0% ($p=0.41$) at follow-up after receiving the academic detailing intervention. The sample consisted of 21 physicians in a suburban, middle class population in the Midwestern US. Academic detailing involves a peer reviewing clinical performance of a provider, providing constructive critical feedback on ways to improve outcomes. This peer is someone with credentials making them adept. Ten physicians were assigned to an enhanced intervention group, in which they were asked to place a special sticker in the chart of their overweight and obese patients. From this sample of physicians, 641 patient charts were reviewed for clinical outcomes at baseline, and were compared to outcomes in 631 charts at 12-months after intervention. Outcomes investigated included physician obesity awareness, weight, height, BMI blood pressure, lipids and glycosylated hemoglobin levels. In addition to the comfort level of providers, findings included increased reference to obesity management in the plan of care from 2.4% to 9.2% ($p=0.001$) in the Intervention group and from 2.4% to 15.6% ($p=0.002$) in the Enhanced Intervention group. Additionally, in the year-long period investigated, patients in the intervention group lost 2.5% ($p=0.20$) versus 3.3% ($p=0.083$) in the Enhanced Intervention group. The overall average weight loss of patients was significant ($p=0.027$) at 5.4 pounds. The authors call for more research with larger samples and with a control group for purposes of determining which interventions are more effective.

Significant improvement was also found in documentation of BMI ($p<0.0001$), height ($p<0.0001$), diagnosis ($p<0.05$), and counseling for diet ($p<0.05$) and physical activity ($p<0.05$),

as well as completeness score ($p<0.0001$) calculated by tallying the indicators of compliance with the NHLBIs obesity guidelines 3 months after a continuing education (CE) session (Farran, Ellis & Barron, 2012). In this quasi-experimental retrospective study, encounter notes for 210 patients in 3 urban private practices in Nashville, Tennessee were reviewed before and 3 months after the CE session. Results in a similar study (Barnes, Theeke & Mallow, 2015) were not quite as encouraging. A random sample of 100 charts of patients seen on a given day in a primary care center affiliated with the School of Medicine at a large state University in West Virginia was reviewed 6 months prior to the planned intervention and again 6 months after. The authors designed an intervention based on the National Institutes of Health (NIH) clinical guidelines on the management of obesity, which included educational sessions for providers, resources for the providers to give patients, a provider reminder system and provider feedback. Although providers did not significantly increase documentation of diagnosis and management of obesity in patients with a BMI greater than or equal to thirty, recording of height weight and BMI in the patient chart by medical assistive personnel increased significantly by 13% ($p<0.05$). Given these findings, the importance of investigating barriers and enablers to management of the obese patient is underscored.

The literature with regard to the alignment of provider practice patterns with clinical practice guidelines has a few limitations. Firstly, most of the studies involve physicians as the only provider participants. Secondly, the setting is limited by geographic region in most of the studies analyzed. Only one study included a nationally representative sample. Finally, most of the studies were conducted in urban areas.

The literature reviewed above indicates low compliance overall with clinical practice guidelines for the management of overweight and obesity in adults. Therefore, investigators

would like to know what care is being provided in the management of adult overweight and obesity.

In 2006, Forman-Hoffman, Little and Wahls investigated the care for obesity in the Veteran's Health Administration (VHA). Their sample included all primary care physician's assistants and physicians at the Iowa City Veteran's Affairs Medical Center and affiliated primary care clinics (n=97). Participants were given a 47-item survey. Rates of current weight-management practices reportedly utilized by providers was low on a Likert-type of 4 point scaling system of Never, Rarely, Sometimes and Always. BMI was calculated at a mean of 3.2, but informing patients of their BMI or weight only received a mean of 2.7. Providers reported recommending weight loss to their patent at a mean of 3.3, but the mean of specifically discussing diet was 3.1 or exercise was 3.3. Referral to specialized care was by far the lowest scored management strategy; dietician (2.7), physical therapy (2.3), behavioral counselor (1.8), group weight loss treatment (1.7), and bariatric surgery (1.5). Over sixty-five percent of participants reported never prescribing medications for weight loss.

Low rates of obesity management services have been found by a number of other studies (McAlpine &Wilson, 2007; Brown, Stride, Psarou, Brewins & Thompson, 2007; Bleich, Pickett-Blakely & Cooper, 2011; Diffenderfer, 2016). McAlpine and Wilson aimed to analyze obesity-related counseling services in the U.S. from 1995 to 2004. They investigated trends in counseling for diet, exercise and weight loss as well as characteristics of patients, physicians, and the visit itself. Data was collected from the National Ambulatory Medical Care Survey (NAMCS) surveys given from 1995 through 2004. The samples ranged from 2,095 to 7,891 in those years. The rates of reported counseling of patients for weight loss decreased by 30% in the 8-year span

of the study. The most frequent obesity management activities included counseling for diet or nutrition (20%), exercise (14%) and weight loss (16%).

Factors found to increase the likelihood that obesity-management activities took place during the visit included longer visit time, pre-existing obesity diagnosis and reason for visit being weight-related concerns. Brown et al. (2007) sought to uncover the practice patterns of primary care nurses in the United Kingdom. Questionnaires were given to 564 nurses, with a response rate of 72.3%. In the United Kingdom, there are three different types of nurses. District nurses care for the elderly requiring care at home. The practice nurse works with more of a focus on prevention and disease management in a general practice setting. Lastly, primary prevention-type of activities for families and children are primarily carried out by health visitors. The study found that practice nurses were the only ones reporting substantial obesity management activities, accounting for approximately 5% of their time. Activities performed with relation to obesity-management included BMI assessment (64.4%, 36.2%) much more often than measurement of waist circumference (16.1%, 3.3%), as well as lifestyle change counseling with regard to diet (55.4%, 29.6%) and exercise (55.9%, 28.4%). Percentages indicate percent of respondents who have ever performed the activity listed, followed by the percentage who perform the activity in a given week.

In a similar descriptive study, Bleich et al. (2011) analyzed data from the 2005 NAMCS survey. The investigators found that only 28.9% of obese adults received a diagnosis of obesity. Significant predictors for receiving the diagnosis of obesity included female sex, age 18-29, severe or morbid obesity. The diagnosis of obesity was one of the largest predictors of weight-related counseling. Counseling for weight reduction occurred in 17.6% of the visits of obese patients. Counseling with regard to diet occurred in 25.2% and exercise in 20.5% of visits by

obese patients. Each type of counseling was significantly associated with the visit being a preventive-type visit and with longer visit times. Diffenderfer (2016) found in a retrospective chart review of 100 charts randomly sampled between 2013 and 2015 at the primary care clinics of the University of Kentucky's Health Sciences Center that only 44% of charts of obese patients had ICD codes present. People with higher classes of obesity were significantly more likely to have these codes present (p=0.039), as were African Americans (p=0.47). Patients with Class III obesity had the highest ICD code rate at 40%. They also had the highest percentage of obesity-related education provided at the last visit (47.8%) as well as the highest percentage of referrals (44%), although these findings were not significantly different from the other classes. Education was provided to obese patients 23% of the time, with the presence of comorbidities having significant impact on the frequency of education. Prescribing of medications to aid weight loss was only mentioned in two of the 100 charts.

Alternatively, in a descriptive study of 101 physicians (54% response rate) practicing in New England, Phelan, Nallari, Darrock and Wing (2009) found a large number of participants (75.5%) reported addressing overweight and obesity issues with their patients when relevant "'always'" or "'nearly always'" (p. 117). Participants were asked to rate the frequency with which they used weight loss strategies on a Likert scale where 1=never and 7=always.

Recommendations with regard to diet and exercise, including increasing physical activity, reducing consumption of fast food and sodas, reducing consumption of fast food and eating a low fat diet were at the top of the recommendations with mean frequency scores of 5.4 and above. Recommendations with regard to specific calorie or carbohydrate goals, weighing regularly and keeping a food diary ranged in scores from 3.8 to 4.5. Even the recommendation to decrease the amount of television viewed received a very low score of 3.6. While the most

recommended items are important for providers to discuss, setting goals and self-monitoring are key features of successful weight loss.

**Summary and limitations.**

Generally, practice patterns of providers do not align well with the guidelines. Low levels of obesity management interventions were also found in the literature. All of the studies deal with practice patterns of providers in the U. S. with the possible exception of one deal with the care provided by physicians. The one study dealing with the nursing population was conducted in the United Kingdom, in which the healthcare structure is quite different from ours. Additionally, only one article was written since the updated clinical practice guidelines were released.

## Barriers and Enablers to Effective Obesity Management

A great deal of literature exists on the perceptions of barriers and enablers to obesity management. Much of this literature overlaps with beliefs and attitudes. Those topics are discussed later in this paper. In this section, literature is reviewed that deals independently with topics identified by the study authors as merely barriers and enablers.

**International considerations.**

In 2011, Lugtenberg, Burgers, Besters, Han and Westert attempted to uncover perceived barriers to guideline adherence in general in 703 general practitioners in the Netherlands. The questionnaire dispersed was completed by 264 providers, giving a 38% response rate. Barriers to implementation of the guidelines included difficulties changing routines and habits (35%). Additionally, external factors were identified as the biggest barriers to implementation, including patient ability and behavior (30%) and patient preference (23%). Because this study was conducted on barriers to implementation of specific guidelines provided with the questionnaire instead of care in general, other barriers identified included lack of applicability in general (22%)

of the specific guideline the provider was being questioned on and lack of applicability to individual patient (25%).

Barriers and enablers to implementing the 2006 National Institute of Health and Clinical Excellence's (NICE) guidelines for the prevention and management of overweight and obesity have been investigated (Gunther, Guo, Sinfield, Rogers & Baker, 2012; Sinfield, Baker, Pollard & Tang, 2013). In a qualitative study of 7 general practitioners, 7 practice nurses and 9 obese patients in the East Midlands, England, semi-structured interviews were conducted (Gunther et al., 2012). Transcripts of recordings were analyzed using a thematic framework analysis. Patient barriers identified included the stigma of diagnosis of obesity, the cost of services in the private sector, and previous experience and failure with weight loss efforts. Enablers identified by patients included a trusting relationship with their provider. Providers reported that implementation of the guidelines was not their responsibility, but that of local commissioners, another healthcare role in the British medical system. Additional barriers identified by providers included a view that obesity is a non-medical issue, lack of consistency in services provided, lack of time with patients and lack of counseling skills. Enablers identified by the providers included provider confidence and having the guidelines embedded in practice policies and procedures. The final area of evaluation in this study was barriers and enablers of primary care services identified by providers and patients. The biggest barrier identified was lack of availability of certain services due to restriction criteria or lack of capacity. The primary enabler at this level was implementation of the quality and outcomes framework, which increased awareness of obesity management.

Data from interviews with providers and patients regarding barriers and enablers to implementing the NICE guidelines on management of adult obesity collected in another study

was presented to 12 medical practitioners (Sinfield et al., 2013). Two implementation groups were formed to determine the most important enablers and barriers and suggest possible interventions to aid in implementing the guidelines. Groups agreed that the most important barriers were provider and patient "inertia" (p. 244), or motivation, and lack of resource availability. Interventions recommended to overcome these barriers included better weight management within the practice and better patient information. Enablers identified included practitioner attitude, confidence, availability of services to refer to, and availability to patients who have successfully lost weight.

**Primary care in the United States.**

A number of barriers to addressing and treating obesity in primary care within the U. S. have been identified in the literature (Forman-Hoffman, Little & Wahls, 2006; Glauser, Roepke, Stevenin, Dubois & Ahn, 2015). Sub-optimal levels of training with regard to obesity management in medical school (23.6%) and residency (30.9%) was an identified barrier in a study of 55 primary care clinicians in the Iowa City Veteran's Affairs Medical Center (Forman-Hoffman, Little & Wahls, 2006). Providers reported system-level barriers including more information with regard to weight-management services offered by the Veteran's Affairs (VA) (94.4%), and need for the VA to create more comprehensive care for such services (83.6%). Few (27.3%) identified payment deficits by insurers as a barrier to weight management services. Glauser et al. (2015) identified a number of barriers with regard to communication between provider and patient that may exist. The researchers distributed a survey to 1625 physicians in the U. S. Over half of the physicians surveyed rated each category of the barriers in communication section of the survey as somewhat or very significant. Categories included "Fear of offending the patient by raising the issue", "Concern that the patient is not interested in

discussing the issue", "Lack of training on how to discuss obesity", "Lack of resources to which I can refer…" and "Low likelihood of succeeding in helping my patients…" (p. 5). Another barrier to the management of adult obesity in the U. S. identified in this study was an overall lack of familiarity with the clinical practice guidelines. On a 10-point familiarity scale, the most familiar guideline was a guideline specifically for the support of the bariatric surgery patient among bariatricians (6.5). The bariatricians were more familiar with all of the guidelines than the cardiologists, endocrinologists, and primary care providers (PCP) with the exception of PCP familiarity with the Institute for Clinical Systems Improvement guideline on prevention and management of obesity. Both scored a 3.7 familiarity level with this guideline.

**Interdisciplinary care.**

In order to adequately manage overweight and obesity, an interdisciplinary management approach would be ideal. In 2016, Asselin, Osulana, Ogunleye, Sharma and Campbell-Sherer conducted a mixed-method randomized control trial including a 6 month team-based educational intervention designed to improve obesity management quality in primary care. Twenty-nine healthcare providers (7 mental health workers, 7 dieticians, and 15 registered nurses or nurse practitioners) at 12 family practice clinics were included in the intervention. Qualitative data was collected from interviews, field notes and logs. Four themes emerged from the data. The first theme identified was availability, referring to the ability of people to meet and communicate in a reasonable timeframe. Participants identified that tight scheduling of patients limited time for face-to-face communication. Another issue with availability was schedules of providers; they may not be in the clinic at the same times often. The second theme identified was Referrals. Providers indicated that there was more of a need for referrals to take place as well as for referrals to be appropriate for provider referred to and for the patient. The third theme was role

perception, or the understanding of the provider's role by the interdisciplinary team members. The fourth and final theme was Messaging. This theme dealt with the approach to weight management by the providers in the clinic, as well as communication strategies by personnel within the clinic between themselves and patients. Interestingly, participants reported that communication and interdisciplinary relationships allowing for continual cooperation in meeting the needs of the patients with negotiation in the areas of these themes was more important than strictly defining the themes themselves.

**Summary and limitations.**

The literature provides a wide range of identified barriers and enablers, from a patient, provider, and system-level perspective. The items identified overlap with beliefs and attitudes discussed next, and are almost impossible to separate. Limitations in the literature with regard to barriers and enablers include low response rates, low sample numbers, and minimal numbers of studies dealing specifically with primary care among various providers in the U. S.

## Attitudes and Beliefs

In reviewing the literature with regard to perspectives, attitudes and beliefs of providers, a number of primary topics repeat themselves. The primary areas of investigation in the literature include overall attitudes of providers with regard to obese patients, provider beliefs about the causes of obesity, self-efficacy of providers with regard to treatment of obesity, and the outcome expectations of providers.

**Provider attitudes toward obesity.**

In a qualitative meta-synthesis of 20 studies, healthcare providers and students were found to have negative and biased attitudes toward overweight patients (Digiacinto, Gildon, Stamile &Aubrey, 2015). Supporting this finding, a descriptive study found that over 50% of

primary care physicians from a national sample described obese patients as awkward, unattractive, ugly and noncompliant (Foster, Wadden, Makris, Davidson, Sanderson, Allison & Kessler, 2003). In 2009, Tina Lundeen published a descriptive study of 97 nurse practitioners in the state of North Dakota. Among her findings, 93% of the nurse practitioners reported that the risks of obesity are overstated, 34% agreed or strongly agreed that they feel "disgusted when faced with a patient who is morbidly obese" (p. 54).

Alternatively, a couple of studies found positive attitudes among providers or students. In the study by Forman-Hoffman, Little and Wahls (2006) described previously, only 32.7% of respondents believed that most of their obese patients were not motivated to do anything about their weight. Brown, Stride, Psarou, Brewins and Thompson (2007) found that 45.2% of nurses viewed obese patients as unmotivated. However, 51.9% disagreed that obesity is due to lack of self-control and 60.7% disagreed that obese patients are lazier than other patients. Only 4.3% reported feeling disgusted by obese patients as well.

Ip, Marshall, Vitolins, Crandall, Davis, Miller, Kronner, Vaden and Spangler (2013) found medical students to have a mildly positive attitudes about caring for obese patients, with a mean score of 24.4 on their NEW Attitudes Scale. This measurement scale was deemed reliable and valid in the study.

Puhl, Peterson and Luedicke (2013) examined the public perception of provider language related to overweight and obesity in a descriptive survey of 1064 American adults. The perceptions and preferences of 10 terms used by providers to describe body weight were analyzed using a five-point Likert scale. Most desirable terms for providers to use included weight (3.43) and unhealthy weight (3.24). Terms viewed as most motivating to lose weight by respondents included unhealthy weight (3.77) and overweight (3.51). Terms viewed as most

undesirable (1.61-2.06), stigmatizing (3.66-4.05) and blaming (3.622-3.94) included morbidly obese, fat, and obese. Respondents reported that if they felt stigmatized about their weight by their doctor 19% would avoid future appointments and 21% would find another doctor.

In a descriptive study of 500 U. S. Health professionals, individual behavioral factors were believed to be important causes of obesity (Bleich, Bandara, Bennett, Cooper & Gudzune, 2015). These factors included physical inactivity, overconsumption of food, eating out, consumption of high-sugar beverages, lack of will power and lack of knowledge of good eating habits. Brown et al. (2007) found similar factors attributed to obesity including lack of will power around food (34.7%), and personal choices with regard to food and activity (68.9). Family history was also cited as a potentially important cause in this study (57.4%). In the study previously described by Foster et al. (2003), physicians rated low levels of physical activity as the most significant cause of obesity ($p<0.0009$). The next highest rated causes for obesity were overeating and a high-fat diet. Genetic factors, poor knowledge of nutrition and psychological problems were identified by about 50% of the physicians as very or extremely important causes of obesity as well. An interesting finding by Lundeen (2009) was that over 50% of the nurse practitioner respondents believed that obesity is tied to patient personality type. Additionally, supporting other studies, 88% of respondents reported personal choices with regard to diet and exercise explained the patient's obesity. Only 30% believed that a patient's obesity was caused in most cases by another medical problem.

**Provider self-efficacy.**

Dieticians or nutrition professionals were found to be significantly more likely to report high confidence levels (88%) in helping obese patients achieve significant weight loss than other health professionals including nurses (61%), mental health professionals (51%), exercise science

(52%) or pharmacy (61%) ($p<0.05$ ) (Bleich et al., 2015). These nutrition professionals were also more likely to feel successful in helping obese patients achieve significant weight loss (81% compared to <50% for all others) ($p<0.05$). Similarly, Brown et al. (2007) found in their study of nurses in the U.K. that only 21.6% felt effective in managing obesity. Alternatively, Lundeen (2009) found that only 33% of nurse practitioner respondents believed that they were ineffective in motivating patients to lose weight.

Physicians also report low self-efficacy with regard to management of obesity (Foster et al., 2003). Of the sample of 620 physicians, less than 50% reported feeling competent in prescribing weight loss programs. Only 14% reported feeling successful in helping obese patients with weight loss efforts.

**Provider outcome expectations.**

Overall, provider expectations are that patients will not meet goals. DiGiacinto et al. (2016) found in their qualitative meta-analysis that physicians believed obese patients had unrealistic goals, and that physicians believed that most patients could not loose and maintain their weight loss. Treatment of obesity was found to be considered significantly less effective than treatment for 9 of 10 other chronic conditions by a sample of 620 physicians in the U. S. (Foster et al., 2003). Of these physicians, 75% agreed with recommendations that 10% reduction in body weight is enough to improve complications. They viewed 14%, however, as an acceptable outcome. Similar increased weight loss expectations by physicians were found by Phelan et al. (2009). In this descriptive study of 101 physicians, the adequate weight loss goal for an obese patient would be the equivalent of 21.5%, with a 10.6% loss described as "disappointing" (p. 115).

**Summary and limitations.**

Generally, providers seem to have low opinions of their obese patients, at times even finding them disgusting. The overall consensus is that behavioral factors cause obesity in the majority of cases. Providers in general do not feel confident or prepared in managing their obese patients. They do not believe generally that the obese patient will be successful in maintaining their weight loss, and may even set weight loss goals initially too high. Limitations with the literature relating to expectations, attitudes and beliefs would include few recent studies. Newer clinical practice guidelines have been published in 2013 and 2016, and most of these studies were conducted prior to these dates.

**Conclusion**

The literature paints a poor picture with regard to the appropriate obesity management practices based on clinical practice guidelines. Additionally, a number of barriers to care are identified that will require significant changes in practice and systems to overcome. Some enablers identified are noteworthy, including a trusting relationship between provider and patient. Finally, a number of challenges are identified with regard to provider perspectives, beliefs and attitudes. Many of these falsely held beliefs will require extensive educational intervention to overcome. Within the literature, a number of limitations exist. A large proportion of the studies are solely dealing with physicians. Additionally, the large majority of the studies are descriptive design, which cannot only describe characteristics or patterns, but not provide any insight into causes of the phenomenon. Most of the studies included in the literature review are survey or questionnaire type of studies with self-report of data by participants. This design can lead to false reporting. Finally, many of the studies are more than five years old. However, there seems to be a gap in the literature since publication of the most recent clinical practice guidelines in the United States.

## Implementation Plan

With the obesity epidemic escalating at alarming rates, new clinical practice guidelines have been published in recent years (American Association of Clinical Endocrinologists & American College of Endocrinology. 2016; American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). Research has been mixed on the impact of educational sessions on improving obesity care management of providers, with some finding no impact on provider practice (Barnes, Theeke & Mallow, 2014) and others finding improvement (Farran, Ellis & Barron, 2013).

### Project Design

The scholarly project was one of healthcare delivery innovation focus. The design was a quantitative, quasi-experimental, descriptive approach. Pre and post tests to assess provider practice patterns, beliefs and attitudes were administered prior to and approximately two weeks after the intervention.

### Research Questions

The scholarly project being undertaken sought to answer two questions:

- Will healthcare providers' confidence in management of adult obese patients according to the obesity clinical practice guidelines significantly increase two weeks after attending a one-day conference?
- Will healthcare providers' practice patterns align significantly more with the adult obesity clinical practice guidelines two weeks after attending a one-day conference?

### Sample

A purposive sampling strategy was used. Healthcare providers consisting of nurse practitioners (NP), NP students, physicians, or physicians' assistants (PA) were invited to be included in the sample. Inclusion criteria consisted of a current license to practice as a NP, PA or physician in the state of Mississippi. Registered nurses licensed to practice in the state of Mississippi who were currently enrolled in a Nurse Practitioner program were also included in the sample. Exclusion criteria was lack of these credentials.

**Setting**

The setting was a School of Nursing in a rural University town in Bolivar County, MS. The School of Nursing had a Nurse Practitioner Program and affiliations with many local and statewide healthcare facilities. Additionally, the School of Nursing is involved with many health-promotion activities, and the research was certain to be well received in this arena. The mission of the School was to "transform healthcare in the Mississippi Delta and beyond" (Delta State University, 2016). The current project could transform care of the obese patient. No research was found regarding the obesity management practice patterns of providers in the region. The town was located in a central area of the state to draw participants from Washington, Sunflower, Humphreys, Leflore, Grenada, and Coahoma counties, as well as Bolivar. However, the recruitment methods could have brought practitioners from distant areas of Mississippi if they were willing to travel.

**Barriers.**

Several barriers were anticipated to the current research. Firstly, the continuing education workshop could have been presented on a day of the week that was not convenient for healthcare providers who were interested. Secondly, some providers who were interested may not have wanted to travel if they resided in a distant area within the state. Also, some providers who work

in solo practice and were not members of the Mississippi Association of Nurse Practitioners (MANP) may not have received notice of the CE session. Finally, some providers in the area may not have been interested in learning more about management of obesity.

**Facilitators.**

A number of entities were identified as possibly functioning as facilitators to the research, making the research possible. The Health Resources and Services Administration (HRSA) provided funding for the Delta Healthy Families Project which helped make the research possible by providing funding for the continuing education units providers were awarded, as well as for printing and other supplies needed. Delta State University and specifically the Robert E. Smith School of Nursing provided the venue for the continuing education workshop. The University Institutional Review Board reviewed the legitimacy and ethical quality of the research. The MANP aided with recruitment through sending email blasts to the Nurse Practitioners within the state. Finally, Mississippi Nurses' Foundation awarded the continuing education intervention with continuing education units (CEUs), which made it more worthwhile for providers to attend.

The biggest anticipated challenge to the research in the setting described was actually making an impact on the practice of providers. Providers are still stuck in the mindset of seeing high numbers of patients a day. Proper management of obesity in the adult client takes time, and the number of patients potentially needing the treatment is very high. Gaining provider buy-in that the continuing education (CE) session was worth their time was the first challenge. However, this challenge was partially overcome by offering free CEUs. Getting provider buy-in to attempt to align their management of the obese adult with the clinical practice guidelines was another challenge altogether. The CE session addressed specific ways to overcome the time

challenge easily and get the necessary treatment completed as well as see results in patient outcomes and their bottom line.

**Stakeholders**

Several stakeholders were identified for the current project. Healthcare providers in Mississippi, specifically the delta had an interest because of possible reimbursement through changing their practice patterns to include more structured weight loss programs. Patients had an interest because the project could impact the care they are provided. Additionally, healthcare facilities had an interest in the project because the project could affect the manner in which care is provided by their employees. Insurance companies had an interest as well.

**Congruence of Organization to Scholarly Project**

The facility in which the scholarly project was implemented was the Robert E. Smith School of Nursing (SON) on the Campus of Delta State University. The SON has a five-year plan with four goals (Delta State University Robert E. Smith School of Nursing, 2016). The academic nature of the facility lends to most of the goals dealing with maintaining high integrity of programs and increased enrollment to fulfill the healthcare needs of the area. The SON has a close relationship with the community. It strives for community involvement and feedback, and the fourth goal of the five-year plan is for the SON to "to increase university outreach, service, and partnership initiatives to benefit the citizens of the region" (p. 11). One method by which it aims to accomplish this goal is through support of evidence-based research that can support positive outcomes in healthcare. The current scholarly project was directed toward aligning practice patterns of healthcare providers with evidence-based practice guidelines. This project was congruent with the SON goal of supporting positive outcomes in healthcare for the citizens of the delta.

**Recruitment Plan**

A variety of methods were utilized to recruit participants. An email blast was sent out in February of 2017 through the Mississippi Association of Nurse Practitioners (MANP). Flyers were sent to contact people at local healthcare facilities for review and distribution if approved by their individualized procedures. The flyer was sent to leaders in local Mississippi Nurses' Association (MNA) chapters for distribution as well. The Robert E. Smith School of Nursing Facebook page, as well as pages of numerous School of Nursing faculty members were used for promotional materials for the conference as well. Registration was required at least one week prior to the conference through mail, email or fax.

**Evidence-Based Measures**

Permission was obtained by Dr. Ian Brown to utilize and edit a questionnaire used in his research on the practices, beliefs and attitudes of practice nurses in the United Kingdom (Brown, Stride, Psarou, Bewins & Thompson, 2007). Two advisory groups were used in development of the survey. One group included nurses and the other group included patients with obesity. Initial testing of the questionnaire was done with nurses. The questionnaire was amended, and then piloted with a group of 32 nurses. Having included clinicians and patients in development of the questionnaire, content validity was considered "good" (p. 337). The researchers also established reliability through follow-up in the initial testing phase as well as the pilot study phase.

All parts of the questionnaire, except for the demographic data, were 5-point Likert scale questions (Brown, et al., 2007). Descriptive statistics were primarily used including Mann-Whitney U and chi-square; however, some parametric tests such as the Pearson r were also cited. The Brown questionnaire consisted of 12 sections containing 59 questions; including 13

demographic questions, 21 questions regarding practice activities, and 25 questions about attitudes, beliefs and views on obesity.

**Translation Strategies**

The first step to implementation of the current scholarly project was the development of the CE program and applying for CE credit with Mississippi Nurses' Foundation. The next step was to begin recruitment as described above. Initial announcements of the upcoming CE were announced as soon as MNF approved the program for CE credit, in February. During this time, the details of registration and promotional items for distribution were developed. Attempts were made during January and early February to make arrangements with various nursing organizations to send information about the conference to their constituents. MANP graciously agreed to assist the researcher in this capacity. The CE program was held March 3 at the Robert E. Smith School of Nursing.

Upon arrival to the CE program, participants completed the *2016 Obesity Management Patterns in Mississippi* pre-test including questions related to confidence levels with regard to the management of obese adult patients and provider practice patterns. Demographic data was collected from all participants including current email address. Conference participants were made aware that continuing education documentation would held until the follow-up survey(s) were received by the researcher. The six-hour CE program familiarized providers with current clinical practice guidelines for the management of adult obesity. The *2016 Obesity Management Patterns in Mississippi* post-test was sent to all participants who completed the conference March tenth by email. The final follow-up survey was sent by email to all participants who completed the conference March 13. The expected response rate was 60%. CE certificates were sent to respondents within two to three days after receipt of the post-test.

**Outcomes**

Three items on the edited survey related to familiarity with the clinical practice guidelines. These items included two questions with regard to familiarity with different guidelines. One question asked if all providers within the facility of the provider practiced according to the same set of guidelines, and required a yes or no answer. Frequency distribution was used to analyze these questions. Participants were retested on these three questions on the two-week follow-up questionnaire. Results were compared to initial results to see if the CE had any impact on provider knowledge of the clinical practice guidelines using a t-test.

Three point Likert-scale items were used to analyze provider levels of confidence in managing obesity. Nine items were included on the survey including past educational experience, feelings about managing obesity, and perceived effectiveness. Items were completed in the initial survey and in the two-week follow-up to see if the CE intervention had any impact on the scores. The items were analyzed with descriptive statistics including frequencies and means, with a paired t-test used to determine the impact of the intervention.

Practice patterns utilized by providers were measured using 8 Likert-type questions with answer selections of “Rarely”, “At comprehensive visit only”, “At problem focus obesity visit only”, and “At every visit”. Descriptive statistics were used to analyze this ordinal data. Five additional questions regarding referral activities were included in this management section. These items collected information on the number of patients referred to different services in a given month. Answer choices for this ordinal data include: “0-5 patients”, “6-10 patients”, “11-15 patients”, “16-20 patients” and “>20 patients”. Again, descriptive statistics were used to analyze these questions giving frequencies and means for each question. The scores on the initial questionnaire was compared to scores on the two-week follow-up questionnaire to see if there

was any increase in management strategies and rates of referrals following the CE intervention using inferential statistics. Using repeated measures design, paired t-tests were used to determine if the intervention had any effect practice patterns of primary care providers in Mississippi.

## Results

To combat the skyrocketing obesity epidemic, providers must change something about the manner in which they practice. To begin this transition, a thorough knowledge of current evidence-based recommendations is required. Only then can can providers gain the confidence needed to treat overweight and obesity properly, aligning current practice patterns with up to date guidelines.

The National Institutes of Health (NIH) Office of Extramural Research online training module entitled *Protecting Human Research Participants* was completed on August 27, 2016 as required by the Delta State University Institutional Review Board (IRB). The Delta State University IRB reviewed the research project and granted it exempt status from full review, IRB approval # 17-003. Two amendments were requested to the original application, and approved by the IRB. On February 13, 2017 request was made to update the year within the project title from 2016 to 2017 and to include RNs licensed to practice in the state of Mississippi who are currently enrolled in a Nurse Practitioner program. This amendment was approved on the same day. A second amendment was requested on March 2, 2017 to change the post-test follow-up time from one month to two weeks. This request was approved on March 3, 2017.

**Demographics**

Figure 1. Age

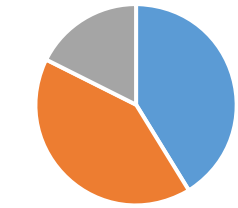



Figure 2. Years in Practice

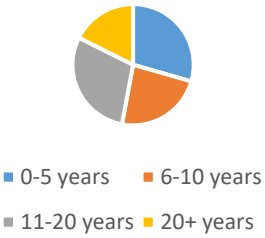
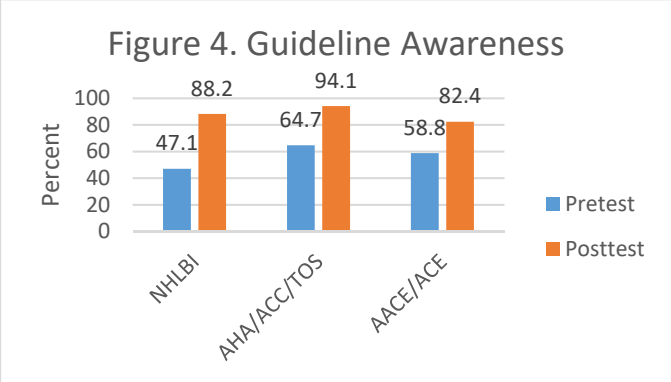


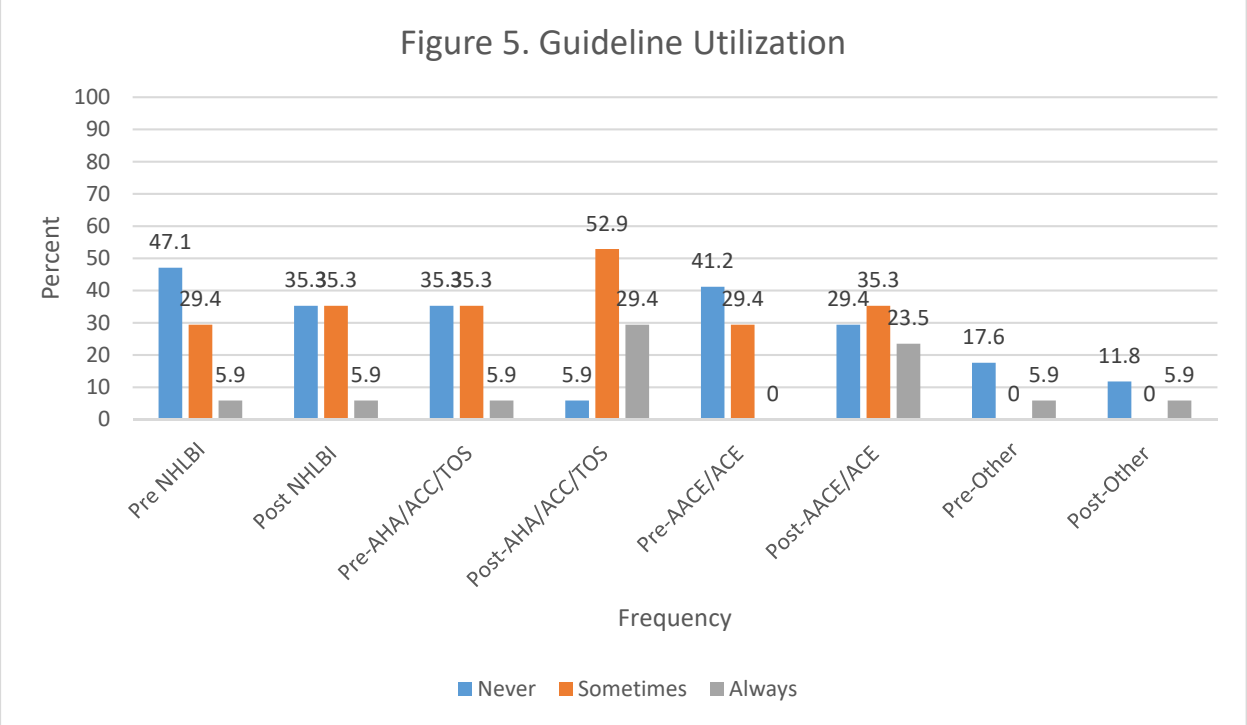

Figure 3. Current BMI


On March 4, 2017, nineteen females attended the six-hour workshop *2017 Obesity Clinical Practice Guidelines Update for Healthcare Providers Managing Obesity in Mississippi*. Of those 19 attendees, only 17 completed the study by returning the post-test required for them to receive the CE certificate for the workshop. Therefore, pretest data from these two participants was excluded from the study. The response rate of the study was therefore 89.47%. Data was analyzed using IBM SPSS Statistics Package 23. Full demographic data of the population is presented in Appendix A. The age of the participants was distributed among the age groups provided on the questionnaire, with the majority being below the age of 60 (Figure 1). The participants consisted primarily of Nurse Practitioners (52.9%) and Nurse Practitioner students (41.2%). One participant was a Nurse Educator student. The majority of participants practiced in primary care (76.5%) full time (70.6%). Providers reported a wide range of years in practice (Figure 2). The majority of providers (70.6%) reported managing between 10-20 patients per day in their office. Approximately 77% of participants self-reported a body mass index (BMI) placing them in the overweight or obese classification levels, with 11.8% reporting not knowing their BMI (Figure 3). Additionally, approximately 94% reported attending at least one continuing education event focusing on obesity in the past three years.

## Awareness and Utilization of the Guidelines

Provider awareness of the three sets of most recent overweight and obesity management guidelines was measured before and two weeks after the workshop (Figure 4). Provider awareness increased for each set of guidelines. Awareness on the post-test was highest at 94.1% for the set of guidelines the workshop focused on the most. A significant increase was found for awareness of the NHLBI guidelines ($t$= -2.746, df=16, p=0.014) and AHA/ACC/TOS guidelines ($t$ = -2.582, df=16, p=0.020). Provider guideline utilization improved as well (Appendix B, Figure 5). In comparing pretest to posttest response rates, the number of providers answering "Never" to the frequency with which they use each guideline decreased, most dramatically with the AHA/ACC/TOS guidelines, with 35.3% reporting never using the guidelines on the pretest, and only 5.9% reporting never using them on the posttest. With this same guideline, the number of providers reporting "Sometimes" using them increased from 35.3% to 52.9%. The number of providers reporting

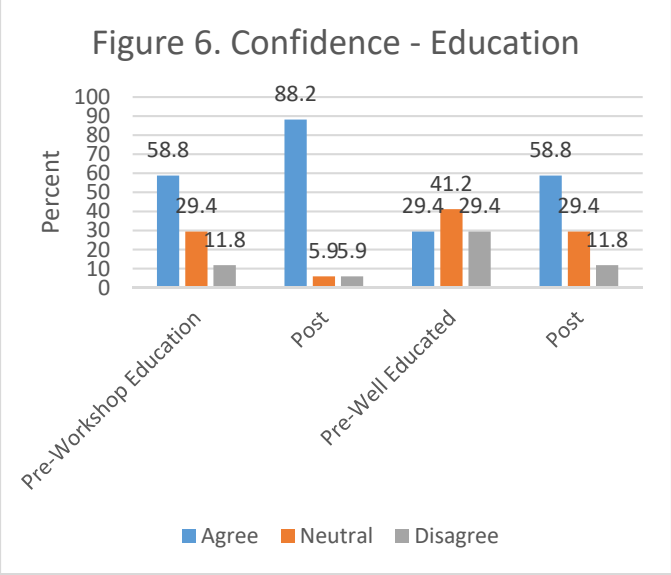


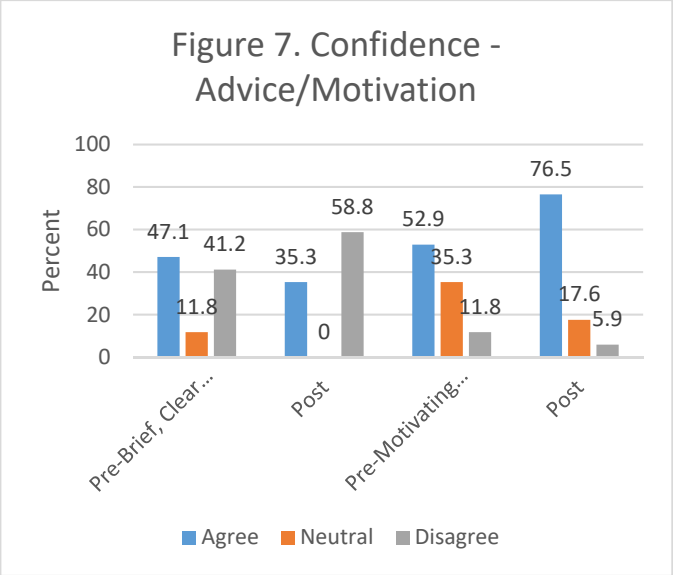



"Always" using them increased dramatically from 5.9% pretest to 29.4% posttest. Providers reported a slight increase in utilization of the NHLBI guidelines as well. Providers reported a dramatic difference in the "Always" category with use of AACE/ACE guidelines as well from 0% pretest to 23.5% posttest. A significant increase was found in self-reported utilization of the AHA/ACC/TOS ($t$= -3.054, df=16, p= 0.008) and AACE/ACE guidelines ($t$=-0.168, df=16, p=0.013) following the workshop.

**Confidence Levels**

Two of the questionnaire (Appendix E) items asked about provider beliefs and feelings with regard to their education dealing with overweight and obesity management. The first stated, "I believe my education provided the information needed to manage overweight and obese patients". The percentage of participants who marked "Agree" on the questionnaire increased from 58.8% to 88.2% following the workshop provided (Appendix C, Figure 6). The second question dealing with education on the questionnaire stated, "I feel I am well-educated on overweight and obesity management". Again, improvement was shown from pre-workshop to post-workshop, with the percentage of participants marking "Agree" rising to 58.8% from 29.4%. The number of participants who marked "Disagree" dropped from 29.4% to 11.8%. The difference in this question pre-workshop and post-workshop showed statistical significance on analysis ($t$=2.704, df=16, p=0.016). Providers reported an increase in disagreement with the following statement "It is usually sufficient to give a patient brief, clear advice about weight management" from 41.2% before the workshop to 58.8% afterwards (Figure 7). Additionally, providers reported a substantial, yet

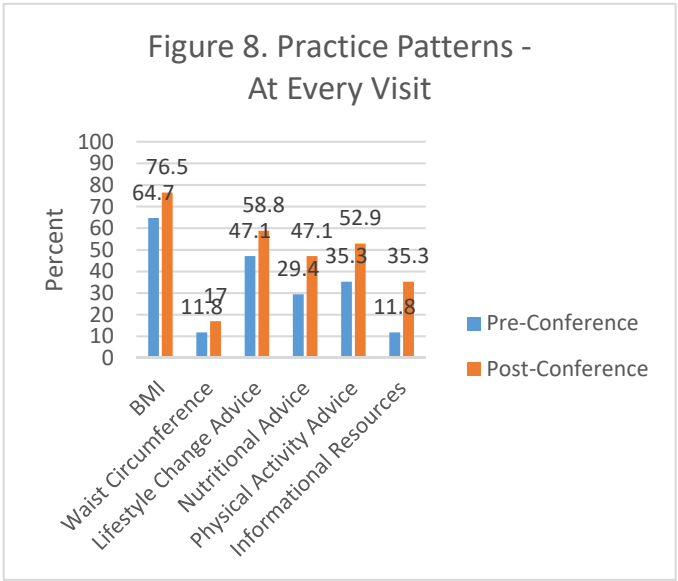




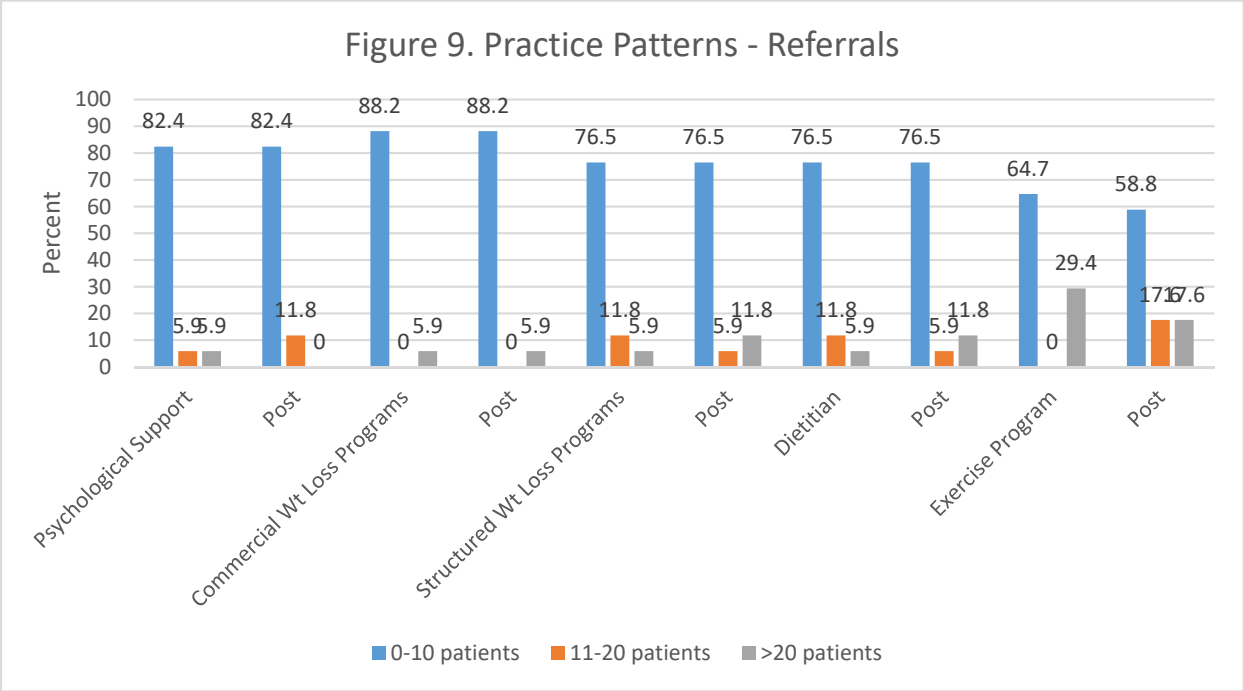

statistically insignificant increase in their effectiveness in motivating patients to lose weight (Figure 7). Two additional questions on the questionnaire with regard to confidence dealt with awkwardness and embarrassment talking with patients about weight loss. There was very little change in the stratification of responses (Appendix C). However, while 11.8% of the participants reported feeling embarrassed discussing weight loss with patients before the workshop, only 5.9% reported this feeling afterward.

**Practice Patterns**

According to the guidelines; BMI, height, weight and waist circumference should be recorded at least annually on patients who are overweight or obese (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). For each practice pattern listed in the questionnaire (Appendix E), participants were given the following options to choose from "At every visit", "At problem focus obesity visit only", "At comprehensive visit only" and "Rarely". One participant on the pre-test and two on the post-test marked both "At problem focus obesity visit only" and "At comprehensive visit only". These answers were coded in SPSS

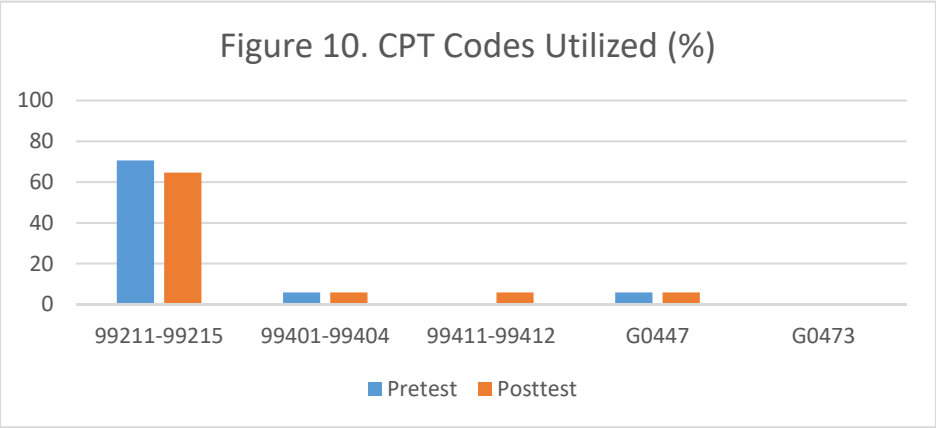


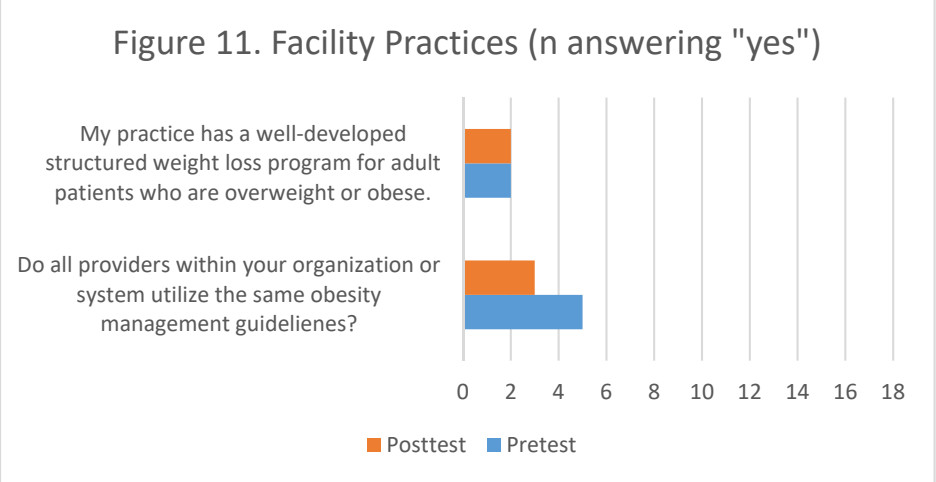
as “At every visit”. All of the obesity management practices where providers are assessing or intervening themselves demonstrated an increase in percentage answering “At every visit” from pretest to posttest (Figure 8). The only item not included in the previously mentioned figure




asked providers about their weight loss medication usage. The responses for this item remained unchanged with only 64.7% of providers reporting “Rarely” prescribing medications for weight reduction and 17.6% reporting prescribing only at “problem focus obesity visit”. The remainder of the participants omitted the question. Full data for all practice pattern questions is provided in Appendix D. Five of the questionnaire items asked about provider referrals to different services. Provider responses changed very little from pretest to posttest. Providers reported referring a slightly higher number of patients for psychological support, structured weight loss programs, dieticians, as well as to exercise programs after the workshop (Figure 9). Of the possible CPT codes to be used for overweight and obesity visits, the majority of the participants reported using 99211-99215 on both the pretest and posttest at 70.6% and 64.7% respectively (Figure 10). Minimal numbers of participants reported use of any other billing codes. Of the 17 participants,

only two reported their practice having a "well-developed structured weight loss program" (Figure 11). Very few reported all providers managing overweight and obesity using similar guidelines in their facility on either the pretest or posttest.




## Discussion

The project was fully implemented; however, actual attendance at the workshop was lower than desired. Only 19 individuals participated, with only 17 completing the process. The project sought to answer two research questions: Will healthcare providers' confidence in management of adult obese patients according to the obesity clinical practice guidelines significantly two weeks after attending a one-day conference? Will healthcare providers' practice patterns align significantly more with the adult obesity clinical practice guidelines two weeks after attending a one-day conference?

In dealing with providers' confidence in managing adult obese patients, it is essential to understand that lack of counseling skills and training regarding how to discuss obesity have been identified by a number of studies as significant provider-identified barriers to effective treatment of obesity (Gunther, et al., 2012; Sinfield et al., 2013). Most of the research reviewed revealed moderately low levels of provider confidence or feelings of effectiveness in managing obesity (Bleich et al., 2015; Brown et al., 2007; Foster et al., 2003). The current study had similar findings, with only 52.9% of providers reporting agreeing that they believed they were effective in motivating patients to lose weight (Figure 7) on the pretest. In an effort to increase provider self-efficacy and confidence; counseling skills, goal-setting, literacy assessment and other such skills constituted the beginning of the workshop provided in this research project. Interestingly, the participants in this research study reported an increase in self-reported agreement that they are effective in motivating patients to lose weight of 23.6%. Participants also had a decrease in reported embarrassment in discussing weight loss with patients from 11.8% to 5.9%.

Familiarity with current evidence-based guidelines also increases confidence of providers in treating any disorder. Overall, the research has demonstrated a lack of familiarity with current clinical practice guidelines on the management of overweight and obesity (Forman-Hoffman, Little, & Wahls, 2006). The current study supports these findings, with pre-workshop self-reported awareness of the three different guidelines discussed previously ranging from 47.1% for the NHLBI (1998) guidelines to 64.7% for the AHA/ACC/TOS (2014) guidelines. Pre-workshop self-reported utilization of the guidelines was very poor as well, with the highest rate of use of guidelines "Sometimes" was 35.3% for the AHA/ACC/TOS guidelines and "Always" was 5.9% for both the NHLBI and AHA/ACC/TOS guidelines. Following the workshop, awareness of all

three sets of guidelines was increased, with a significant increase shown in awareness of the NHLBI and AHA/ACC/TOS guidelines.

Self-reported utilization of the various sets of guidelines increased following the workshop as well, with a significant increase in self-reported utilization of the more current AHA/ACC/TOS and AACE/ACE guidelines. The rates of guideline utilization reported among the participants in the study remained dismally low, with the only percentage of utilization exceeding 50% being providers "Sometimes" using the AHA/ACC/TOS guidelines. In looking at specific practice patterns, the rates of providers performing some assessment or intervention themselves, such as counseling or measuring BMI, "At every visit" rates increased following the workshop. The only exception was for prescribing weight loss medications. None of these findings were statistically significant; however, improvement in all of these varied activities is a substantial finding. Self-reported measurement of BMI was higher than expected at 64.7% pretest and 76.5% post-test reporting performing this assessment "At every visit". Much lower rates have been recorded in the literature. In 2014, Antognoli et al. found with direct observation BMI assessment to be done on only 2% of patients seen by 28 primary care physicians. These researchers found waist circumference measured in only 1% of the patients seen. One single assessment component of the NHLBI guidelines (1998) was performed in only 47% of the patients seen, with one treatment component performed in only 38% of the patients seen. The current study had low rates of both as well (Appendix D), again, with rates for each item increasing slightly after the workshop.

Rates of providers referring obese patients was essentially unchanged following the workshop. Providers reported referral of 0-10 patients monthly, for all services pre- and post-workshop at rates of over 50%. If one considers the number of overweight and obese patients

being seen by providers in this region, much larger numbers would be expected. These low rates of referral are similar to other findings in the literature (Forman-Hoffman, Little & Wahls, 2006). The ACC/AHA/TOS Guidelines encourage providers to take patient preferences into account when counseling them on diet and/or activity, and encourage consideration of referral to a nutrition professional (American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society, 2014). However, 76.5% of participants in this study reported only referring 0-10 patients per month for these services both before and after the workshop. Providers should also be referring patients to structured weight loss programs according to these guidelines; however, 76.5% of participants only reported referring 0-10 patients monthly at both points in time. However, in the delta region, the number of these types of programs are limited and providers may be uncertain of where to send patients.

The number of participants who believed that their education gave them the information needed to manage overweight and obese patients increased from 58.8 to 88.2%; while those who felt they were well-educated on overweight and obesity management increased significantly from 29.4 to 58.8%. In combination with the other findings of participants feeling more effective in motivating patients to lose weight, the null hypothesis for the first research question is rejected. Providers self-reported a significant increase in utilization of the AHA/ACC/TOS (2014) guidelines and the AACE/ACE (2016) guidelines; however, no significance was found in individual items within the practice patterns. Nonetheless, the null hypothesis for the second research question must be rejected based on their self-reported utilization.

## Conclusion

This study demonstrates that provider confidence in managing overweight and obese patients, as well as alignment of practice patterns with current guidelines can be improved with

educational interventions. Additionally, it reinforces the low levels of familiarity with guidelines, and guideline usage. Very little research was found investigating specifically the practice of nurse practitioners in managing overweight and obese patients, or with the geographic region of the Mississippi delta where obesity rates are the highest in the nation. Because of these two factors, this research is of monumental importance. Providers must understand how we are managing patients in order to determine what must be done to slow the escalating rates of obesity in the region.

**Limitations**

Several limitations were identified for this study. Educational interventions, such as the one used in this project, have been shown in the literature to improve alignment of practice patterns with clinical practice guidelines (Antognoli, et al., 2014; Barnes, Theeke & Mallow, 2015, Schuster, Tasosa & Terwood, 2008). These studies were conducted a minimum of 3 months after the educational intervention, and were either direct observation or retrospective chart review, however. In the current study, the posttest was completed two to three weeks after the workshop. Change in actual practice patterns takes time, and the short timeframe from workshop to posttest simply may have not been enough to implement enough changes to produce significant results in specific practice patterns. A second limitation to the study was the small sample size. Finally, recruitment strategies could have been improved. Time needed to have approval from facility boards for distribution of materials was not taken into account. Additionally, procedures to obtain permission for email blasts by organizations were unfamiliar and should have been investigated before beginning the research. Because of the roadblocks identified with recruitment, the recruitment start date was delayed, which may have impacted the sample size.

## Implications to Advanced Nursing Practice

The study underscores the fact that nurse practitioners feel underprepared with regard to counseling services and obesity management practices. Educators teaching in nurse practitioner programs should use the findings to incorporate more information regarding how to talk with patients, measure their literacy level, and helping them to set goals as well as basic obesity management principles into their nurse practitioner programs.

Realizing the low rates of guideline utilization in the most obese area of the most obese state, more research should be done in the area. Stronger studies relying more on direct observation or retrospective chart analysis could further determine the true guideline utilization rates. Additionally, due to the very low number of participants, research with larger sample sizes should be conducted.

Practicing primary care providers must begin to realize that perhaps the obesity rates are escalating because we are not practicing according to the evidence-based guidelines. We must do an introspective analysis of our practices, identify weaknesses, and strive to improve if we are to turn the health of our country, state, and region around.

## Acknowledgements

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## Appendix A—Characteristics of Study Participants

| | Sample (N = 17) |
|---|---|
| *Age* | |
| 2 < or = to 39 | 41.2% (n = 7) |
| 40-59 | 41.2% (n = 7) |
| 60+ | 17.6% (n = 3) |
| *Gender* | |
| Male | 0% (n = 0) |
| Female | 100% (n = 17) |
| *Practice Setting* | |
| Rural | 88.2% (n = 15) |
| Urban | 11.8% (n = 2) |
| *Practice Type* | |
| Primary | 76.5% (n = 13) |
| Specialty | 11.8% (n = 2) |
| Student | 11.8% (n = 2) |
| *Role/Licensure* | |
| Nurse Practitioner | 52.9% (n = 9) |
| Physician's Assistant | 0% (n = 0) |
| Physician | 0% (n = 0) |
| NP Student | 41.2% (n = 7) |
| MSN Student | 5.9% (n = 1) |
| *Years in practice* | |
| 0-5 years | 29.4% (n = 5) |
| 6-10 years | 23.5% (n = 4) |
| 11-20 years | 29.4% (n = 5) |
| 20+ years | 17.6% (n = 3) |
| *Clinical Practice hours per week* | |
| <10 hours per week | 11.8% (n = 2) |
| 10-40 hours per week | 76.5% (n = 13) |
| >40 hours per week | 11.8% (n = 2) |
| *Average number patients seen per day* | |
| 0-10 | 23.5% (n = 4) |
| 10-20 | 70.6% (n = 12) |
| 20+ | 5.9% (n = 1) |
| *My current BMI* | |
| I do not know | 11.8% (n = 2) |
| 20-24.9 | 11.8% (n = 2) |
| 25-29.9 | 35.3% (n = 6) |
| > Or = 30 | 41.2% (n = 7) |
| *Obesity CEs in past 3 years* | |
| Omitted | 5.9% (n = 1) |
| 1-3 | 82.4% (n = 14) |
| >5 | 11.8% (n = 2) |

## Appendix B—Utilization of Guidelines

| | Sample (N = 17) | |
|---|---|---|
| | Pretest | Post-test |
| *NHLBI Guidelines* | | |
| Omitted | 17.6% (n = 3) | 23.5% (n = 4) |
| Never | 47.1% (n = 8) | 35.3% (n = 6) |
| Sometimes | 29.4% (n = 5) | 35.3% (n = 6) |
| Always | 5.9% (n = 1) | 5.9% (n = 1) |
| *AHA/ACC/TOS Guidelines* | | |
| Omitted | 23.5% (n = 4) | 11.8% (n = 2) |
| Never | 35.3% (n = 6) | 5.9% (n = 1) |
| Sometimes | 35.3% (n = 6) | 52.9% (n = 9) |
| Always | 5.9% (n = 1) | 29.4% (n = 5) |
| *AACE/ACE Guidelines* | | |
| Omitted | 29.4% (n = 5) | 11.8% (n = 2) |
| Never | 41.2% (n = 7) | 29.4% (n = 5) |
| Sometimes | 29.4% (n = 5) | 35.3% (n = 6) |
| Always | 0% (n = 0) | 23.5% (n = 4) |
| *Other Guidelines* | | |
| Omitted | 76.5% (n = 13) | 82.4% (n = 14) |
| Never | 17.6% (n = 3) | 11.8% (n = 2) |
| Sometimes | 0% (n = 0) | 0% (n = 0) |
| Always | 5.9% (n = 1) | 5.9% (n = 1) |

## Appendix C—Confidence Managing Overweight and Obesity

| | Sample (N = 17) | |
|---|---|---|
| | Pretest | Post-test |
| *I believe my education provided the information needed to manage overweight and obese patients.* | | |
| Agree | 58.8% (n = 10) | 88.2% (n = 15) |
| Neutral | 29.4% (n = 5) | 5.9% (n = 1) |
| Disagree | 11.8% (n = 2) | 5.9% (n = 1) |
| *I feel I am well-educated on overweight and obesity management.* | | |
| Agree | 29.4% (n = 5) | 58.8% (n = 10) |
| Neutral | 41.2% (n = 7) | 29.4% (n = 5) |
| Disagree | 29.4% (n = 5) | 11.8% (n = 2) |
| *It is usually sufficient to give a patient brief, clear advice about weight management.* | | |
| Agree | 47.1% (n = 8) | 35.3% (n = 6) |
| Neutral | 11.8% (n = 2) | 0% (n= 0) |
| Disagree | 41.2% (n = 7) | 58.8% (n= 10) |
| Omitted | | 5.9% (n= 1) |
| *I feel that I am effective in motivating patients to lose weight.* | | |
| Agree | 52.9% (n = 9) | 76.5% (n = 13) |
| Neutral | 35.3% (n = 6) | 17.6% (n = 3) |
| Disagree | 11.8% (n = 2) | 5.9% (n = 1) |
| *I feel awkward discussing weight loss with my patients.* | | |
| Agree | 17.6% (n = 3) | 17.6% (n = 3) |
| Neutral | 0% (n = 0) | 0% (n = 0) |
| Disagree | 82.4% (n = 14) | 82.4% (n = 14) |
| *Discussing obesity is often embarrassing for me.* | | |
| Agree | 11.8% (n = 2) | 5.9% (n = 1) |
| Neutral | 5.9% (n = 1) | 0% (n = 0) |
| Disagree | 82.4% (n = 14) | 94.1% (n = 16) |
| *I think that overweight and obesity management is an important area for developing additional support services.* | | |
| Agree | 100% (n = 17) | 100% (n = 17) |
| Neutral | 0% (n = 0) | 0% (n = 0) |
| Disagree | 0% (n = 0) | 0% (n = 0) |

## Appendix D—Practice Patterns in Managing Overweight and Obesity

| | Sample (N = 17) | |
|---|---|---|
| | Pretest | Post-test |
| *I measure BMI:* | | |
| Omitted | 5.9% (n = 1) | 0% (n = 0) |
| Rarely | 5.9% (n = 1) | 5.9% (n = 1) |
| At comprehensive visit only | 23.5% (n = 4) | 11.8% (n = 2) |
| At problem focus obesity visit only | 0% (n = 0) | 5.9% (n = 1) |
| At every visit | 64.7% (n = 11) | 76.5% (n = 13) |
| *I measure waist circumference:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| Rarely | 58.8% (n = 10) | 52.9% (n = 9) |
| At comprehensive visit only | 17.6% (n = 3) | 17.6% (n = 3) |
| At problem focus obesity visit only | 5.9% (n = 1) | 5.9% (n = 1) |
| At every visit | 11.8% (n = 2) | 17.6% (n = 3) |
| *I give lifestyle change advice about weight reduction:* | | |
| Omitted | 5.9% (n = 1) | 0% (n = 0) |
| Rarely | 5.9% (n = 1) | 11.8% (n = 2) |
| At comprehensive visit only | 17.6% (n = 3) | 17.6% (n = 3) |
| At problem focus obesity visit only | 23.5% (n = 4) | 11.8% (n = 2) |
| At every visit | 47.1% (n = 8) | 58.8% (n = 10) |
| *I give detailed nutritional advice about weight reduction:* | | |
| Omitted | 0% (n = 0) | 0% (n = 0) |
| Rarely | 11.8% (n = 2) | 5.9% (n = 1) |
| At comprehensive visit only | 23.5% (n = 4) | 29.4% (n = 5) |
| At problem focus obesity visit only | 29.4% (n = 5) | 17.6% (n = 3) |
| At every visit | 29.4% (n = 5) | 47.1% (n = 8) |
| *I give detailed physical activity advice about weight reduction:* | | |
| Omitted | 5.9% (n = 1) | 0% (n = 0) |
| Rarely | 5.9% (n = 1) | 5.9% (n = 1) |
| At comprehensive visit only | 17.6% (n = 3) | 23.5% (n = 4) |
| At problem focus obesity visit only | 35.3% (n = 6) | 17.6% (n = 3) |
| At every visit | 35.3% (n = 6) | 52.9% (n = 9) |
| *I provide informational resources on lifestyle changes about weight reduction:* | | |
| Omitted | 0% (n = 0) | 5.9% (n = 1) |
| Rarely | 29.4% (n = 5) | 11.8% (n = 2) |
| At comprehensive visit only | 23.5% (n = 4) | 23.5% (n = 4) |
| At problem focus obesity visit only | 35.3% (n = 6) | 23.5% (n = 4) |
| At every visit | 11.8% (n = 2) | 35.3% (n = 6) |
| *I prescribe weight loss medications for weight reduction:* | | |
| Omitted | 17.6% (n = 3) | 17.6% (n = 3) |
| Rarely | 64.7% (n = 11) | 64.7% (n = 11) |

| | | |
|---|---|---|
| At comprehensive visit only | 0% (n = 0) | 0% (n = 0) |
| At problem focus obesity visit only | 17.6% (n = 3) | 17.6% (n = 3) |
| At every visit | 0% (n = 0) | 0% (n = 0) |
| *Referrals in the average month for psychological support:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| 0-10 patients | 82.4% (n = 14) | 82.4% (n = 14) |
| 11-20 patients | 5.9% (n = 1) | 11.8% (n = 2) |
| >20 patients | 5.9% (n = 1) | 0% (n = 0) |
| *Referrals in the average month to commercial weight loss/management programs:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| 0-10 patients | 88.2% (n = 15) | 88.2% (n = 15) |
| 11-20 patients | 0% (n = 0) | 0% (n = 0) |
| >20 patients | 5.9% (n = 1) | 5.9% (n = 1) |
| *Referrals in the average month to structured weight loss program:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| 0-10 patients | 76.5% (n = 13) | 76.5% (n = 13) |
| 11-20 patients | 5.9% (n = 1) | 17.6% (n = 3) |
| >20 patients | 11.8% (n = 2) | 0% (n = 0) |
| *Referrals in the average month to a dietician or nutritionist:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| 0-10 patients | 76.5% (n = 13) | 76.5% (n = 13) |
| 11-20 patients | 11.8% (n = 2) | 5.9% (n = 1) |
| >20 patients | 5.9% (n = 1) | 11.8% (n = 2) |
| *Referrals in an average month to an exercise program or gym:* | | |
| Omitted | 5.9% (n = 1) | 5.9% (n = 1) |
| 0-10 patients | 64.7% (n = 11) | 58.8% (n = 10) |
| 11-20 patients | 0% (n = 0) | 17.6% (n = 3) |
| >20 patients | 29.4% (n = 5) | 17.6% (n = 3) |

# Appendix E— 2016 Obesity Management Patterns in Mississippi Questionnaire

**Demographics:**

1. Age:

- < or = to 39
- 40-59
- 60+

2. Gender:

- Male
- Female

3. Practice setting:

- Rural
- Urban

4. Practice type:

- Primary
- Specialty—specify _____

5. Educational background:

- Nurse Practitioner
- Physician's Assistant
- Physician
- Other—specify_____

6. Years in practice:

- 0-5 years
- 6-10 years
- 11-20 years
- 20+ years

7. Clinical practice hours per week:

- <10 hours per week
- 10-40 hours per week
- >40 hours per week

8. Average number of patients seen per day:

- 0-10
- 10-20
- 20+

9. My current BM is:

- < or = 19.9
- 20-24.9
- 25-29.9
- > or = to 30
- I do not know

10. How many continuing education workshops dealing with overweight and obesity have you attended in the last 3 years?

- 1-3
- 3-5
- >5

11. I am **aware** of the following clinical practice guidelines for obesity management in adults (Select all that apply):

| | |
|---|---|
| | 1998 National Heart, Lung, and Blood Institute (NHLBI) Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. |
| | 2013 American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society. AHA/ACC/TOS guideline for the management of overweight and obesity in adults |
| | 2016 American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) Clinical Practice Guidelines for Comprehensive Medical Care of Patients with Obesity |
| | Other—Please list. |

12. How often do you **utilize** the following clinical practice guidelines for obesity management in adults in your practice?

| | Never | Sometimes | Always |
|---|---|---|---|
| 1998 National Heart, Lung, and Blood Institute (NHLBI) Identification, Evaluation, and Treatment of Overweight and Obesity in Adults. | | | |
| 2013 American College of Cardiology/American Heart Association, Task Force on Practice Guidelines and The Obesity Society. AHA/ACC/TOS guideline for the management of overweight and obesity in adults | | | |
| 2016 American Association of Clinical Endocrinologists (AACE) and American College of Endocrinology (ACE) Clinical Practice Guidelines for Comprehensive Medical Care of Patients with Obesity | | | |
| Other—Please list. | | | |
| None. | | | |

**Confidence in Management:**

13. I believe my education provided the information needed to manage overweight and obese patients.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

14. I feel I am well-educated on overweigh and obesity management.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

15. It is usually sufficient to give a patient brief, clear advice about weight management.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

16. I feel that I am effective in motivating patients to lose weight.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

17. I feel awkward discussing weight loss with my patients.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

18. Discussing obesity is often embarrassing for me.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

19. I think overweight and obesity management is an important area for developing additional support services.

| | |
|---|---|
| | Agree |
| | Neutral |
| | Disagree |

**Clinical Practice Patterns:**

Please indicate the frequency with which you perform the following activities.

Definitions:

**Comprehensive visit:** preventative care or wellness visit

**Problem focused obesity visit:** visit in which the reason for seeing the provider is to discuss their issues with regard to obesity or weight loss

**At every visit:** any visit for any reason

20. I measure BMI:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

21. I measure waist circumference:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

22. I give lifestyle change advice about weight reduction:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

23. I give detailed nutritional advice about weight reduction:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

24. I give detailed physical activity advice about weight reduction:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

25. I provide informational resources on lifestyle changes about weight reduction:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

26: I prescribe weight loss medications for weight reduction:

| | |
|---|---|
| | Rarely |
| | At comprehensive visit only |
| | At problem focus obesity visit only |
| | At every visit |

27. Which CPT codes do you use to bill for overweight/obesity management services?

- 99211-99215 (Established patient, office, or other outpatient visit)
- 99401-99404 (Preventive Medicine, Individual)
- 99411-99412 (Preventive Medicine, Group)
- G0447 (Intensive Behavioral Therapy, Individual)
- G0473(Intensive Behavioral Therapy, Group)

28. Do all providers within your organization or system utilize the same obesity management guidelines?

- Yes
- No

29. My practice has a well-developed structured weight loss program for adult patients who are overweight or obese.

- Yes
- No

**Referrals:**

Please approximate the number of overweight and obese patients in an average month you refer to the following services:

30. Psychological support:

| | |
|---|---|
| | 0-10 patients |
| | 11-20 patients |
| | >20 patients |

31. Commercial weight loss/management programs (e.g. Weight Watchers, Jenny Craig, NutriSystem, etc):

| | |
|---|---|
| | 0-10 patients |
| | 11-20 patients |
| | >20 patients |

32. A structured weight loss program:

| | |
|---|---|
| | 0-10 patients |
| | 11-20 patients |
| | >20 patients |

33. A dietitian or nutritionist:

| | |
|---|---|
| | 0-10 patients |
| | 11-20 patients |
| | >20 patients |

34. An exercise program or gym:

| | |
|---|---|
| | 0-10 patients |
| | 11-20 patients |
| | >20 patients |