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Implementing Obesity Management Guidelines in Rural Primary Care

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Abstract

Problem: In the United States, obesity is one of the leading causes of death among Americans and rates of obesity continue to rise. Geographic location significantly affects the number of obesity cases, with rural areas being affected more than other locations. Despite this, obesity continues to be undertreated by rural primary care providers.

Method: This quality improvement (QI) pilot project utilized a descriptive, observational design to evaluate the implementation of an evidence-based clinical practice guideline algorithm for obesity management in a rural primary care clinic. An algorithm was implemented on patients aged 18-60 years and with a BMI of at least 25 kg/m^2. There were two BMI categories with associated treatments: BMI of 25 to 29.9 kg/m^2 or BMI of at least 30 kg/m^2. Based on the patient's BMI, appropriate treatment was provided. Data collection occurred from January 2023 to April 2023.

Results: Of the eligible patients (N =348), 27% (n = 94) patients had a BMI of 25 to 29.9 kg/m^2, and 73% (n = 254) had a BMI of at least 30 kg/m^2. The algorithm was utilized in 74% (n = 257) of patients. Of the (n = 94) patients with a BMI of 25 to 29.9 kg/m^2, 66% (n = 62) of patients were provided treatment. Of the (n = 254) patients with a BMI of at least 30 kg/m^2, 76% (n = 195) were provided treatment.

Implications for practice: This QI project demonstrated a feasible and cost-efficient method for the enhancement of clinical practice change within rural primary care. Utilization of the obesity management algorithm by the provider could impact patient treatment plans.

Implementing Obesity Management Guidelines in Rural Primary Care

In the United States, obesity is a leading cause of death among Americans and continues to surge throughout the country (Centers for Disease Control and Prevention [CDC], 2022; Okobi et al., 2021). An individual's body mass index (BMI) of 30 kg/m^2 or more is diagnostic of obesity (CDC, 2022). The CDC (2022) reported the prevalence of obesity has drastically increased from 30.5% to 41.9% in the United States from 1999 to 2020. Currently, approximately two in five adults have obesity (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2021). In addition, many suffer from other obesity-related health conditions such as hypertension, type 2 diabetes, stroke, cancer, and coronary heart disease (CDC, 2022). Obesity is a preventable chronic disease, yet morbidity and mortality rates continue to rise, with rural areas affected more so than other regions across the United States (CDC, 2022).

Geographic location significantly impacts the number of obesity cases found in areas across America (CDC, 2017). Rural areas have been linked to poorer health outcomes due to higher poverty rates, lack of healthcare access, limited resources, and minimal, if any, health insurance coverage (CDC, 2022). In America's rural areas, the prevalence of obesity is 6.2 times higher than in urban and metropolitan areas (Okobi et al., 2021). While rural counties continue to struggle with higher obesity rates, rural communities are also affected by other related chronic diseases (Porter et al., 2020). Thus, indicating the importance of promoting weight management in rural healthcare to reduce obesity and associated co-morbidities.

Within rural primary care clinics, obesity, and related chronic diseases, are commonly seen among patients. Unfortunately, obesity continues to be undertreated

(Kahan, 2018). To help reduce morbidity and mortality rates, the U.S. Preventive Services Task Force (USPSTF) released recommendations to promote weight loss among these individuals (USPSTF, 2018). Current recommendations suggest that primary care providers should screen and offer or refer adults with a BMI of 30 kg/m^2 or more to intensive, multi-step, behavioral interventions (USPSTF, 2018). Intensive behavioral therapy (IBT) consists of a personalized weight loss plan created by the primary care provider and patient to promote and maintain weight loss (USPSTF, 2018). IBT consists of multiple components: health advice from the provider, treatment goal(s), behavior change counseling, referral to dietician and support groups, adjunctive medication, and frequent follow-ups to discuss progress (USPSTF, 2018). In addition, the American Association of Clinical Endocrinologists and the American College of Endocrinology have established clinical practice guidelines for diagnosing and managing patients with obesity. The guidelines consist of lifestyle modifications, weight loss medications, and bariatric surgery considerations based on a patient's BMI (Garvey et al., 2016). While these guidelines and recommendations for obesity management exist, not all primary care providers adhere to them (Kahan, 2018). Therefore, indicating the need to create a standardized clinical practice guideline for healthcare providers in rural primary care clinics to address weight management and obesity.

The purpose of this quality improvement (QI) pilot project was to implement and evaluate an obesity clinical practice guideline algorithm utilizing the current recommendations of the USPSTF, American Association of Clinical Endocrinologists, the American College of Endocrinology to enhance obesity management within the rural primary care clinic. The Iowa Model of Evidence-Based Practice was used to guide this

project. The aim of this project was to utilize the obesity management clinical practice guideline algorithm among at least 25% of patients, within three months. The primary outcome measure of this project was assessing the number of patients with a BMI of 25 kg/m^2 or more who were provided treatment based on the obesity management clinical practice guideline algorithm within three months. The secondary outcome measure of this project was assessing provider treatment documentation existed among patients who met treatment criteria based on the obesity management clinical practice guideline algorithm within 3 months. This project targeted to answer the following study question: In rural primary care patients 18-60 years of age with a body mass index (BMI) of 25 kg/m^2 or greater, what is the effect of an obesity clinical practice guideline on healthcare providers' treatment plans in three months?

Literature Review

The following search engines were used in the review of literature: Summon, CINAHL, and PubMed. The key search terms, including Boolean operators, consisted of: "primary care" AND "obesity management" yielding 5,898 results, "intensive behavioral therapy" AND "obesity" yielding 25 results, and "obesity management" OR "obesity therapy" AND "primary care" yielding 1,061 results. To further refine this search, inclusion and exclusion criteria were determined. Inclusion criteria consisted of primary care and obesity management, intensive behavioral therapy in adults aged 18+ years, written in English language, scholarly and peer-reviewed research articles, and article publication dates from 2017 to 2022. Exclusion criteria consisted of obesity management in hospital settings, intensive behavioral therapy in individuals younger than 18 years, written in a language other than English, non-peer-reviewed or scholarly research

articles, and article publication dates prior to 2017. The inclusion and exclusion criteria were applied to the literature search, yielding 845 research articles. Of these, 12 articles were selected for this literature review with levels I through IV of evidence.

Obesity screening and management in the primary care setting have been proven beneficial for patient health outcomes. Garvey et al. (2016) established evidence-based clinical practice guidelines for obesity management. Their clinical practice guideline for obesity consists of lifestyle modifications, weight loss medications, and bariatric surgery considerations based on a patient's body mass index (Garvey et al., 2016). Another systematic review performed by Semlitsch et al. (2019) evaluated evidence-based guidelines for adult obesity. A patient's body mass index was identified as the measurement of choice for obesity diagnosis. In addition, their review stated the gold standard for obesity management consisted of a long-term, multi-factorial lifestyle approach. In this approach, diet modification, exercise, medication, and behavioral therapy were successful in weight management among primary care patients. While both the provider and patient should be involved in developing a weight loss plan, a multidisciplinary approach was found more beneficial. In addition, long-term interventions, consisting of at least 6-12 months were found supportive in reaching optimal weight loss (Semlitsch et al., 2019). Similarly, a systematic review by Ly et al. (2017) assessed behavioral interventions and therapy duration. Weight loss was significantly higher in behavioral therapies lasting at least 12 months; accounting for at least 5-10% of body weight loss among patients (Ly et al., 2017). Borek et al. (2018) reported in their systematic review and meta-analysis, group-based behavioral interventions were found effective when utilized in a 12-month period. Thus, indicating

the importance of long-term planning and adherence among the primary care provider and patient to reach weight goals.

Katzmarzyk et al. (2020) described the effectiveness of an individualized, high-intensity, lifestyle-based program among obese adults in 18 underserved primary care clinics. In total, 803 adult patients with obesity were enrolled. This program consisted of health education provided by a trained health coach, 175 minutes per week of physical activity, dietary portion control, and weekly/monthly sessions. Patients who received the high-intensity program were found to have a significantly higher weight loss ($p < 0.001$), accounting for 5-10% of total body weight loss, compared to the group who received usual care from their primary care providers (Katzmarzyk et al., 2020). Kaikkonen et al. (2019) assessed if behavioral modification and exercise were successful in weight loss among participants. Unlike Katzmarzyk et al. (2020), Kaikkonen et al. (2019) explored if exercise influenced weight loss when incorporated at six months of treatment. Kaikkonen et al. (2019) included 120 patients with a BMI greater than 30 kg/m^2. Their findings conveyed the importance of implementing a weight loss plan, including intensive behavioral modification and weight training, at the beginning of treatment to obtain significant results of $p > 0.001$ (Kaikkonen et al., 2019). Both studies provide statistically significant results when combined therapy was implemented. Therefore, indicating obesity management is best achieved when utilizing combined therapy.

A similar study performed by Wadden et al. (2018) assessed how medication and intensive behavioral therapy can be utilized for increased weight loss among patients suffering from obesity. Different from the previously discussed studies, Wadden et al. (2018) examined the use of Liraglutide 3.0 milligrams among 150 patients. A

combination of intensive behavioral therapy, diet replacement, and Liraglutide use was successful in at least 5% of total body weight loss. Patients who only received intensive behavioral therapy within this study did not show a significant weight change. Thus, signifying the prominence of a multi-component treatment plan (Wadden et al., 2018).

Treatment plans typically include several tools available for primary care providers to utilize for obesity management. Burr et al. (2020) incorporated a tool, known as the Ten Top Tips (10TT), serving as a counseling intervention in diet and physical activity within the primary care setting. Patients reported this tool as helpful and habitual after the 12-week study. A statistical finding ($p = 0.0001$) was discovered between the patients' weight loss behaviors when assessed from baseline and 12 weeks (Burr et al., 2020). While weight loss occurred, no statistical significance was noted (Burr et al., 2020). In addition, Halbert et al. (2017) implemented a 20-minute patient questionnaire, known as the SDM-Q-9. The SDM-Q-9 was used to assess patient responses regarding their weight, further management, and healthcare provider advice (Halbert et al., 2017).

An important factor in obesity management is promoting interventions directed toward sustaining long-term weight loss for patients (Lillis et al., 2021). Lillis et al. (2021) included two types of behavioral therapies for patients who recently finished an online workout program. Therapies consisted of Self-Regulation (SR) and Acceptance and Commitment Therapy (ACT). ACT provided internal awareness and individual goals to promote weight-loss maintenance, while SR referred to maintaining already-changed habits (Lillis et al., 2021). ACT had significant weight loss ($p = 0.05$) when compared to SR (Lillis et al., 2021).

The development of a weight management program consisting of behavioral interventions is crucial for obesity management. Wilholt-Reeves et al. (2020) developed and implemented a weight management program for the primary care setting. Their study included 186 participants and consisted of 26 intensive behavioral therapy sessions within a year. A statistically significant average weight loss of 9.7 pounds was noted ($p < 0.001$; Wilholt-Reeves et al., 2020). Befort et al. (2021) expressed the significance of intensive behavioral therapy performed in a group setting within the rural primary care clinic. The group visits were found to have a significantly higher weight loss, compared to individual visits (Befort et al., 2021).

The Iowa Model of Evidence-Based Practice was used as the guiding framework for this QI pilot project to guide clinicians in decision-making related to clinical or administrative factors affecting health outcomes (Melnyk & Fineout-Overholt, 2019). The first step of the framework encouraged the identification of *Problem-Focused Triggers* or *Knowledge-Focused Triggers* (Melnyk & Fineout-Overholt, 2019). For this project, a *Problem-Focused Trigger* had been identified, and potential opportunities were discovered related to obesity management in a rural primary care clinic. Obesity is a leading chronic disease among patients in this practice. To date, a standardized clinical practice guideline algorithm for obesity management had not been implemented in this setting. Key stakeholders included the rural primary care clinic nurse practitioners, medical doctor, clinic manager, and patients with a BMI of 25 kg/m^2 or more. Sufficient evidence was recognized regarding the importance of obesity management in the primary care setting and implementing a clinical practice guideline for management. A clinical practice guideline algorithm was developed and served as a pilot program within this

primary care clinic. Once completed, data were analyzed to determine the utilization of this algorithm (Melnyk & Fineout-Overholt, 2019).

Obesity among rural primary care patients continues to be underdiagnosed and treated (Kahan, 2018). While many factors contribute to rural obesity rates, early identification, and standardized treatment are essential. Published studies have assessed and recognized the importance of a long-term, multi-factorial lifestyle approach among obese primary care patients and their health outcomes. However, a definitive obesity management clinical practice guideline had yet to be established for healthcare providers within this rural primary care clinic.

Methods

Design

This QI pilot project utilized a descriptive, observational study design. An evidence-based clinical guideline algorithm (see Appendix A) was implemented in the rural primary care clinic for obesity management. The facility determined to pilot the project utilizing one APRN. Data was gathered from January to April 2023. Collected data consisted of the number of patients seen daily by the advanced practice registered nurse (APRN), patients with a BMI of 25-29.9 kg/m^2, patients with a BMI of 30 kg/m^2 or more, algorithms utilized by the APRN, if treatment(s) or referrals were provided, and the number of associated treatment(s) or referrals provided. In addition, a post-implementation chart review occurred among patients who met the guideline criteria for interventions.

Setting

This project took place in a rural primary care clinic with approximately 2,500 patients in south-central Missouri. The primary care clinic was part of a county-owned healthcare organization with approximately 1,900 employees. The clinic's staffing included three APRNs, one medical doctor, five licensed practical nurses, and three secretaries.

Sample

This project utilized convenience sampling of patients assessed by the APRN in the rural primary care clinic. All patients assessed from January to April 2023 by the APRN were included in the analysis. Inclusion criteria for utilization of the obesity management clinical practice guideline algorithm consisted of men and women aged 18-60 years with a BMI of 25 kg/m^2 or more provided care in the rural primary care clinic. Exclusion criteria consisted of men and women younger than 18 years or older than 60 years, a BMI less than 25 kg/m^2, and not provided care within the rural primary care clinic. Patient identifiers were omitted for this QI project. All de-identified patient data was secured on a password-protected file on the student primary investigator's laptop.

Procedures

The obesity clinical practice guideline algorithm was identified by the healthcare organization's board-certified APRN as a needed resource in the rural primary care clinic. Therefore, the development of the algorithm was initiated by the student primary investigator and the APRN in a rural primary care clinic to aid in obesity screening and management. With each patient provided care by the APRN, the licensed practical nurse obtained the patient's weight and height. The weight and height were uploaded into the patient's electronic health record, formulating the patient's current BMI. If a patient's

BMI met the criteria of at least 25 kg/m^2, the algorithm was given to the APRN to utilize during the patient's visit. The algorithm design had two categories: BMI of 25-29.9 kg/m^2 and BMI of 30.0 kg/m^2 or more. Based on the patient's BMI, the category was selected with associated treatment and education. Then, the APRN marked the algorithm boxes with the number of associated treatment(s)/referrals provided to the patient. Descriptive statistics were used to analyze the data.

Data Collection/Analysis

Deidentified patient data were collected prospectively during the implementation period from January 2023 to April 2023. A record consisted of the number of patients assessed/evaluated each day, the number of patients who met the criteria for utilizing the obesity management clinical practice guideline algorithm, the number of algorithms used, if treatment(s) or referrals were provided based on the algorithm, and the number of treatment(s) or referrals provided. Data was recorded on an Excel spreadsheet (see Appendix B). A prospective chart review was completed to verify the APRN documentation of utilization of the obesity management clinical practice guideline algorithm. The chart review occurred on the first Monday of every month within the implementation period.

Approval Process

Prior to this QI project implementation, written approval was obtained from the healthcare organization, the student primary investigator's advisory committee, and the graduate school institutional review board (IRB). In September 2022, the healthcare organization's director of medical research stated the organization would not be overseeing this QI project, as it does not meet the requirements for their review.

Results

The QI pilot project implementation period was from January 2023 through April 2023, at a rural primary care clinic. The APRN saw a total of (*N* = 799) patients during this period. Of those, (*n* = 425) patients were aged 18 to 60 years. There were (*N* = 348) eligible patients who were within this age group and had a BMI of at least 25 kg/m^2, accounting for 82% of patients within the implementation period (see Figure 1). These patients were in one of two categories: BMI of 25 to 29.9 kg/m^2 or BMI of at least 30 kg/m^2. Based on their BMI category, associated treatment(s) were provided according to the obesity management clinical practice guideline algorithm. Of the (*N* = 348) eligible patients, 27% (*n* = 94) had a BMI of 25 to 29.9 kg/m^2 and 73% (*n* = 254) of patients had a BMI of at least 30 kg/m^2 (see Figure 2). The APRN utilized the obesity management clinical practice guideline algorithm among 74% of patients (*n* = 257) during the implementation period.

Among the 27% (*n* = 94) patients who had a BMI of 25 to 29.9kg/m^2, 66% (*n* = 62) of patients were provided treatment by the APRN (see Figure 3). Each patient was provided a lifestyle modification intervention (*n* = 62) consisting of reduced-calorie healthy meal plan and physical activity recommendations. Of the 73% (*n* = 254) of patients with a BMI of at least 30 kg/m^2 who met obesity diagnosis, 76% (*n* = 195) of patients were provided treatment (see Figure 4). The BMI category of at least 30 kg/m^2 had additional treatment options, consisting of a lifestyle modification intervention, dietician referral, and/or weight management medication. A total of (*N* = 406) treatment interventions were provided to patients who fell in the obesity category of a BMI of at

least 30 kg/m^2. Therefore, providing a sum of (N = 483) total treatments/referrals among both BMI groups.

The APRN's documentation was reviewed on the first Monday of every month within the implementation period. The chart review assessed APRN documentation of the use of the algorithm and associated interventions on eligible patients. The review concluded the APRN successfully documented utilization of the algorithm and treatments provided to eligible patients.

Discussion

The purpose of this QI pilot project was to implement and evaluate an obesity clinical practice guideline algorithm for obesity management in a rural primary care clinic. The aim was to utilize the algorithm among at least 25% of patients within a three-month period. During the project implementation, the APRN utilized the algorithm among 74% of patients, significantly surpassing the goal of 25% utilization. The primary outcome measure included assessment/identification of how many patients with a BMI of 25 kg/m^2 or more were provided treatment based on the algorithm within a three-month period. Of the 348 patients who met the age and BMI criteria, 257 patients were provided treatment utilizing the obesity management algorithm. There was a significantly higher patient population with a BMI of at least 30 kg/m^2, accounting for 73% of the pilot sample. Therefore, indicating the importance of addressing and managing obesity within rural primary care. A total of 483 treatments/referrals were provided to these patients. Patients who had a BMI of 25 to 29.9kg/m^2 were provided with one lifestyle modification treatment intervention. Patients who had a BMI of at least 30 kg/m^2 were provided with

up to three treatment interventions including a dietary referral and weight management medication.

The secondary outcome measure of this study was an assessment of APRN documentation on patients who met the algorithm criteria. A prospective chart review occurred once each month within the implementation period. Findings revealed accurate documentation on patients who met algorithm criteria and received treatment(s). This included APRN documentation of algorithm utilization, patient care plan, and associated treatment(s)/referrals provided to each patient.

The Iowa Model of Evidence-Based Practice was the framework chosen to guide this QI project. A problem-focused trigger was identified regarding the high rates of obesity among the rural population and the lack of standardized treatment plans for obesity in the rural primary care clinic. A team was formulated, and the obesity management clinical practice guideline algorithm was created based on current recommendations of the USPSTF, the American Association of Clinical Endocrinologists, and the American College of Endocrinology. The algorithm was implemented among the patients seen by the APRN who met the criteria, within a three-month period. Findings were evaluated and found beneficial for obesity management by the APRN. Additional pilot studies are recommended to further investigate the improvement and use of the algorithm.

The implementation of the obesity management clinical practice guideline algorithm changed the APRN's approach to obesity management in rural primary care practice. Previously, a protocol or guideline for obesity management among providers in this practice didn't exist. However, obesity rates are high among this patient population,

accounting for 73% of the patient sample size, indicating the importance of advocating for change. This QI project established a foundation for clinical practice change within the rural primary care clinic. However, additional studies would be beneficial for further investigation of intensive behavioral options in this clinic. As previously discussed, intensive behavioral therapy significantly impacts weight loss among obese patients (Garvey et al., 2016).

Strengths and limitations were identified within this QI pilot project. Strengths included the utilization of the algorithm among 74% of the APRN's patients who met the criteria, and the algorithm was reported as "user friendly". In addition, the APRN discussed weight management with her patients during their visits and provide treatment interventions based on their BMI. Previously, the clinic did not have access to an algorithm for obesity management. Therefore, the APRN stated this algorithm allowed her to focus on appropriate interventions for patients in each BMI category. The obesity management clinical practice guideline algorithm was provided during the patient encounter and reminded the APRN to discuss weight management.

Limitations of the project were not including individual patient data, such as demographics and patient history. Only aggregate data was included. Only one healthcare provider from the rural primary care clinic participated in this pilot project. Future recommendations include assessment of patient weight loss post-implementation of the obesity management clinical practice guideline algorithm and associated treatments.

Conclusion

Obesity rates are high among rural patients, accounting for 82% of the patient sample in this QI pilot project. The obesity management clinical practice guideline

algorithm was successful in aiding the APRN to identify and treat overweight and obese patients in rural primary care. The algorithm had a high percentage compliance utilization rate of 74% during the implementation period and low cost. Appropriate interventions were provided for patients who met the age and BMI criteria, based on the current recommendations of the USPSTF, the American Association of Clinical Endocrinologists, and the American College of Endocrinology. Further studies are recommended to identify individual patient outcomes based on the obesity management clinical practice guideline algorithm. However, this QI pilot project provided a foundation for establishing an obesity management clinical practice change in rural primary care.

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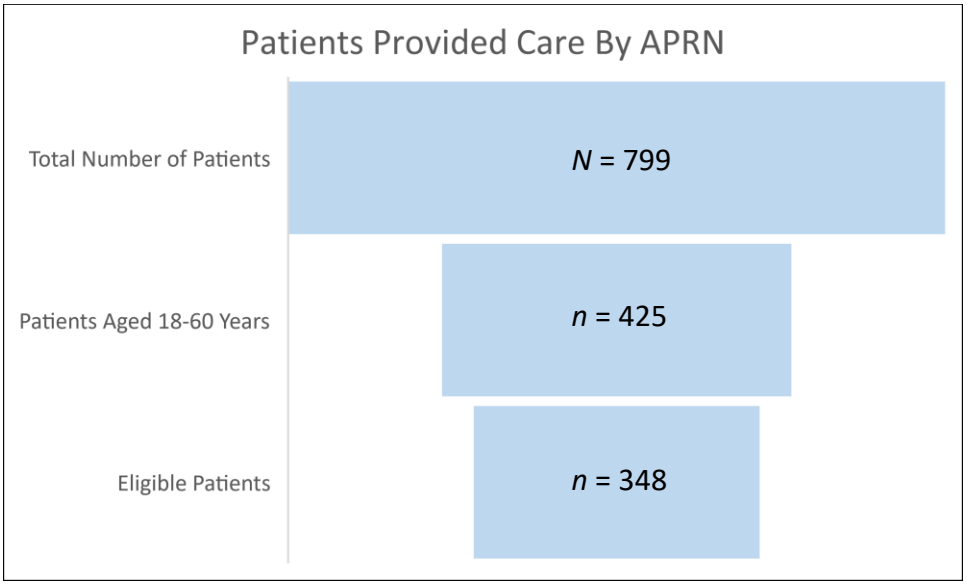
Figure 1

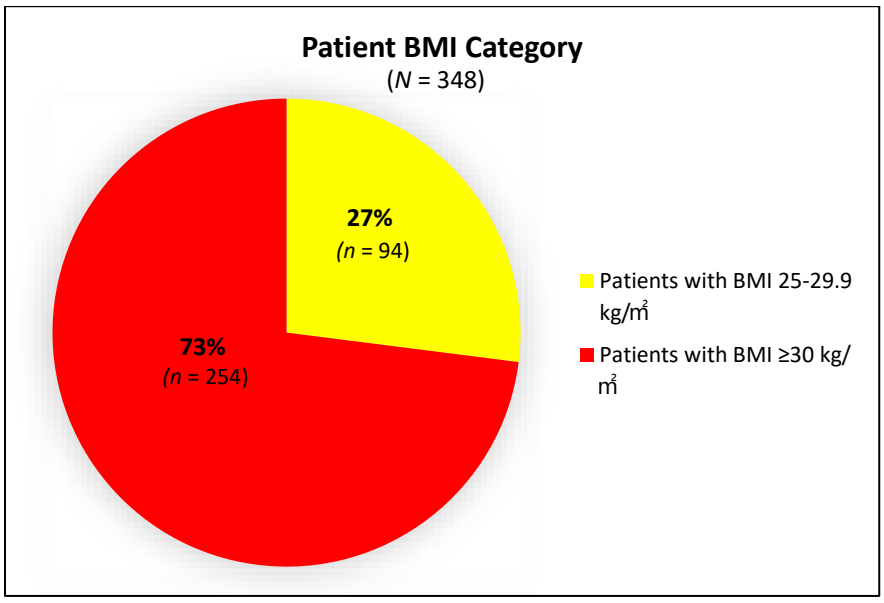
Patients Provided Care from January 2023 to April 2023



Note. This chart represents the number of eligible patients from January 2023 to April 2023. 82% (*n* = 348) of patients were within the age group and had a BMI of at least 25 kg/m^2.

Figure 2

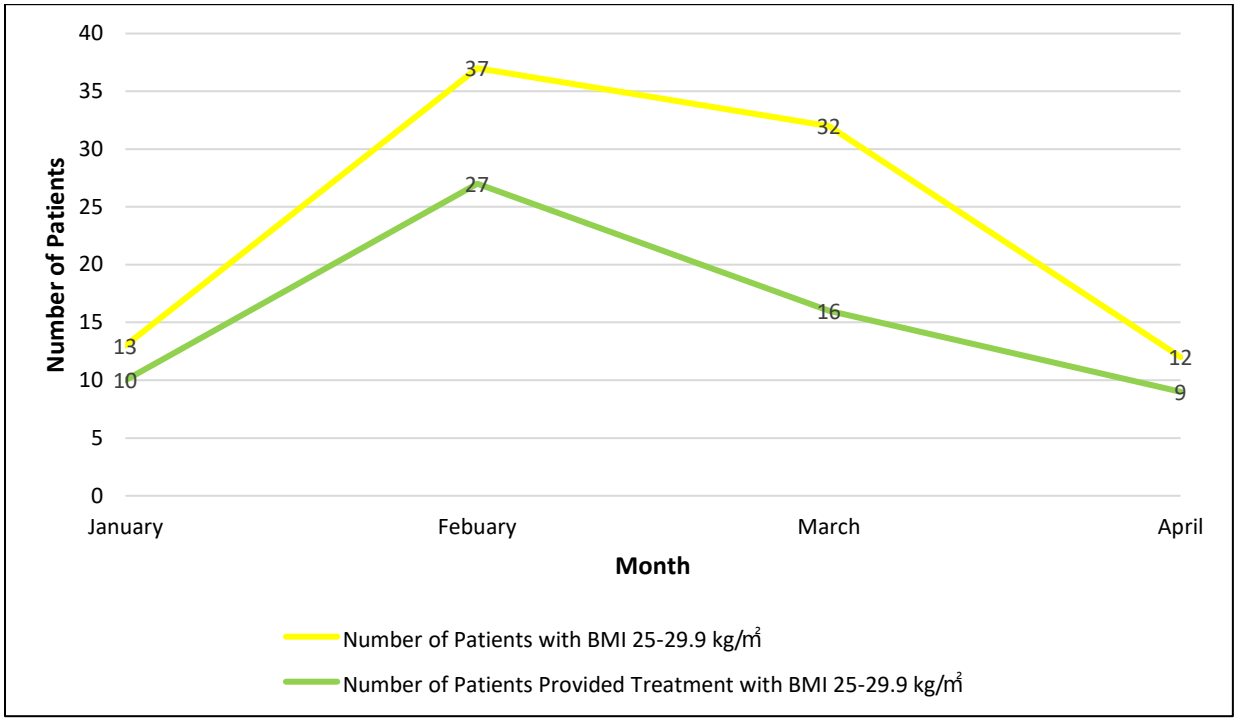
Patient BMI Category



Note. Pie chart represents the total number of patients seen by the APRN with a BMI of at least 25 kg/m^2 from January 2023 to April 2023 (N = 348).

Figure 3

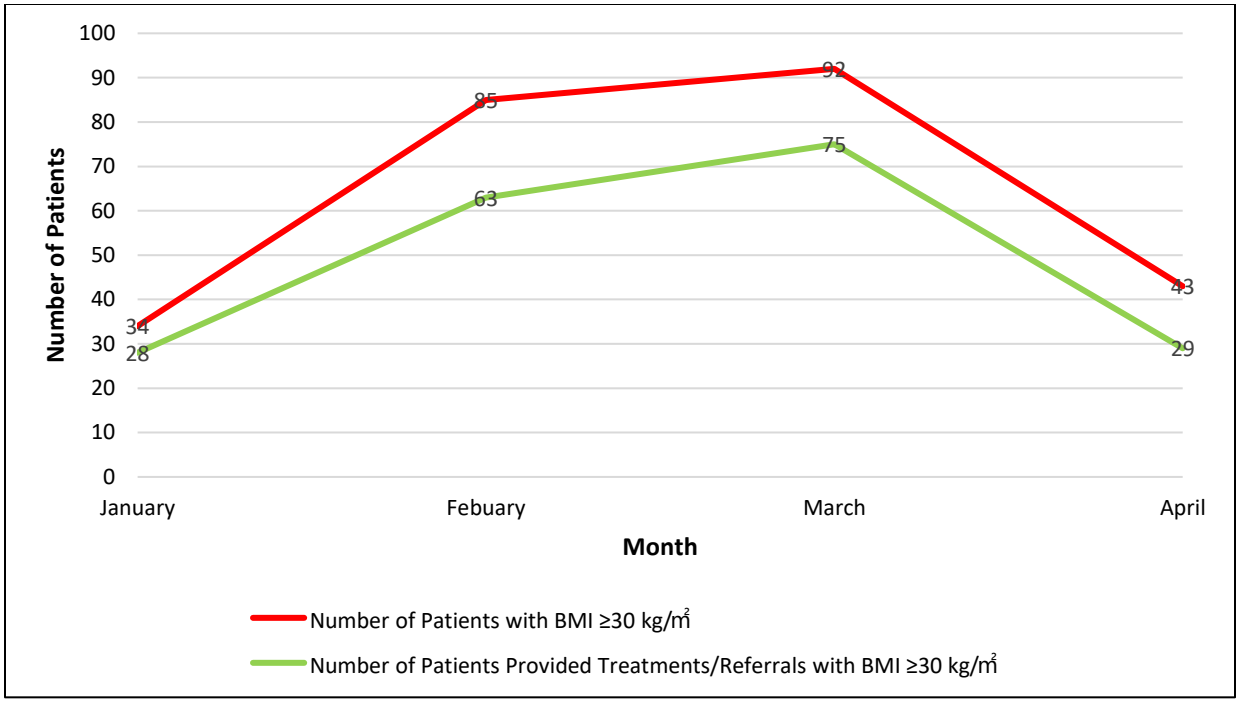
Patients with BMI of 25-29.9 kg/m^2 and Treatments Provided



Note. Represents the total number of patients seen by the APRN with a BMI of 25-29.9 kg/m^2 (n = 94) and the number of patients who were provided treatment within this group. 66% (n = 62) of patients were provided treatment.

Figure 4

Patients with BMI ≥30 kg/m^2 and Treatments/Referrals Provided

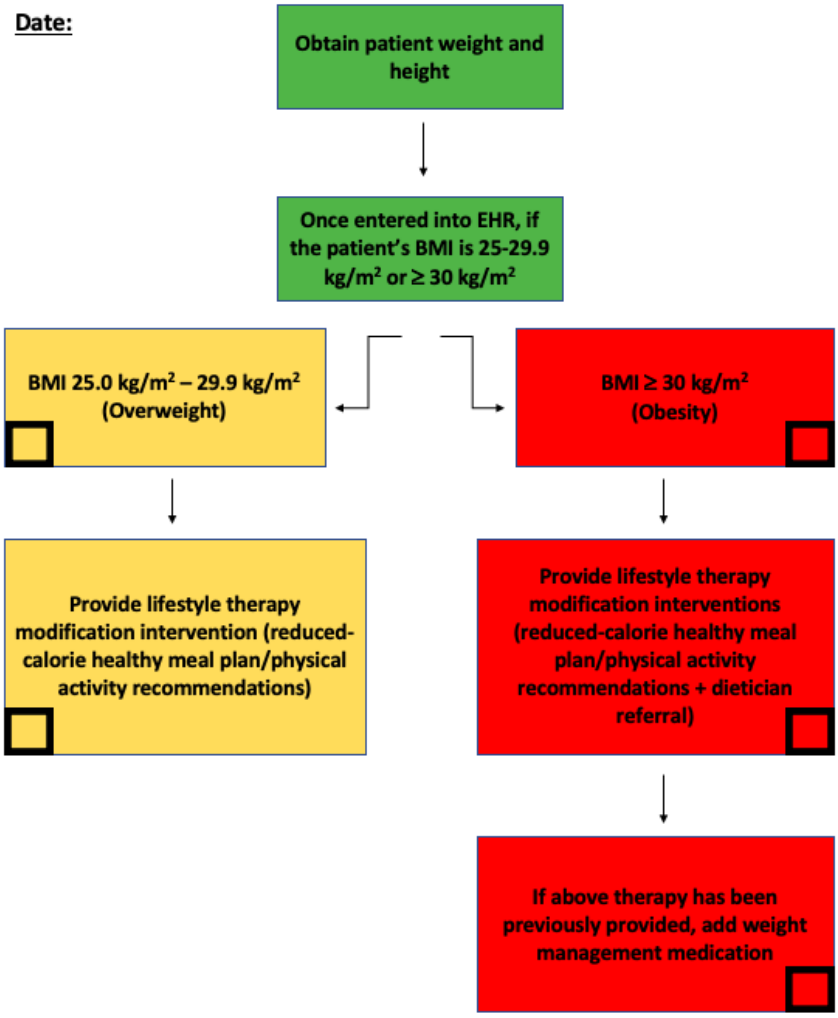


Note. Represents the total number of patients seen by the APRN with a BMI ≥30 kg/m^2 (*n* = 254) and the number of patients provided treatments/referrals within this group. 77% (*n* = 195) of patients were provided treatment.

Appendix A

Figure 1

Obesity Management Clinical Practice Guideline Algorithm



Note. Obesity management algorithm for rural primary care. Adapted from "American Association of Clinical Endocrinologists and American College of Endocrinology Comprehensive Clinical Practice Guidelines for Medical Care of Patients with Obesity" by W. T. Garvey, J. I. Mechanick, E. M. Brett, A. J. Garber, D. L. Hurley, A. M. Jastreboff, K. Nadolsky, R. Pessah-Pollack, and R. Plodkowski, 2016, *Endocrine*

Appendix B

Table 1

Data Collection Excel Spreadsheet

Date	Total number of patients seen by APRN	Total number of patients seen by APRN aged 18-60 years	Number of patients with a BMI of 25kg/m^2 – 29.9 kg/m^2	Number of patients with a BMI of 30 kg/m^2 or more	Number of algorithms used by APRN	Number of patients provided treatment with BMI 25 kg/m^2 – 29.9 kg/m^2	Number of treatments provided for BMI 25 kg/m^2 – 29.9 kg/m^2	Number of patients provided treatments/ referrals with BMI of 30 kg/m^2 or more	Number of treatments/ referrals provided for BMI of 30 kg/m^2 or more	Number of treatment or referrals provided (to each patient total)
1/23	80	47	13	34	38	10	10	28	58	68
2/23	266	155	37	85	90	27	27	63	136	164
3/23	299	154	32	92	91	16	16	75	165	181
4/23	134	69	12	43	38	9	9	29	47	70

Note. This table demonstrates the data collection on an Excel spreadsheet. Data collection was from January 27th, 2023, to April 17th, 2023. January 2023 was limited to seven collection days and April 2023 was limited to 17 collection days, as to why the data is significantly lower than February and March 2023.