Promoting Weight Loss: A Primary Care Intervention

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Table of Contents

Abstract

Problem: Approximately 80 million people in the United States are affected by obesity and the prevalence has increased by approximately 11% from 2017-2020. Providers are aware of the obesity risk factors and co-morbidities, but some still lack the knowledge to educate patients properly on weight reduction.

Methods: Data was collected over a four-month period in a primary care setting related to weight loss and education for patients with obesity. Descriptive statistics were summarized, and a quantitative analysis was used to determine if an educational toolkit was provided by the provider to patients with a BMI>35% and if the provider documented the patients' correct BMIs within the Electronic Health Record.

Results: The average patient age was 65.7 and males and females were equally represented. Although the toolkit was consistently given to patients. the McNemars chi-square test performed did not show a significant difference in the documentation of weight loss education. Results of a Kruskal-Wallis rank sum test indicated that there was not a significant difference in BMIs pre- and post-implementation but 28.6% of patients experienced weight loss and 25% maintained their weight without additional gain.

Conclusion: Providers and patients received benefits from having access to an educational toolkit. Twenty-eight percent of patients experienced weight loss and 25% maintained their weight without any gain. There was a mild improvement in weight loss education documented by providers and the correct BMI was updated in the EMR for all patients in the study.

Keywords: weight loss, obese, BMI>35, eating habits, weight loss education, ICD 10 codes

Promoting Weight Loss: A Primary Care Intervention

Approximately 80 million people in the United States (U.S.) are affected by obesity, with an expected increase to over 50% by 2030 (Andolfi & Fisichella, 2018) Weight gain can be attributed to the increased intake of sugar, carbohydrates, and sodium and the overall increase in the amount and types of foods consumed (Marengo, 2019). Comorbidities linked with obesity are diabetes, hypertension, hyperlipidemia, heart disease, vascular disease, respiratory issues, joint disease, mental health issues like depression and anxiety, and strokes (AAPC, 2022; Andolfi & Fisichella, 2018; CDC, 2022; Fruh, 2017; Kyrou et al., 2018). Obesity-related conditions represent the leading causes of preventable and premature deaths in the U.S. (Centers for Disease Control and Prevention [CDC], 2022). It is important to understand that the estimated annual medical costs for treating obesity-related conditions in the U.S. exceeded 170 billion dollars in 2019 (CDC, 2022).

Over three-quarters of the states and territories in the U.S. are considered to have an average BMI greater than 30% (CDC,2023). Depending on the degree and duration of weight gain, obesity can progressively cause and/or exacerbate a broad spectrum of co-morbidities, including type 2 diabetes mellitus (T2DM), hypertension, dyslipidemia, cardiovascular disease (CVD), liver dysfunction, respiratory and musculoskeletal disorders, sub-fertility, psychosocial problems, and certain types of cancer (AAPC, 2022; Andolfi & Fisichella, 2018; CDC, 2022; Kyrou et al., 2018; World Health Organization [WHO], 2022).

Providers have expressed that there is a gap in provider education related to nutrition that contributes to the lack of education provided to obese patients (Baute et al., 2018). Education plays a crucial role in adherence to lifestyle modifications after weight loss and may decrease weight regain rates and improve patient outcomes (Groller, 2017). Encouraging patients to be

more active in improving their health is a hard task, but providers also require evidence-based nutrition education to ensure proper instruction is given for that success (Baute et al., 2018).

Purpose

The purpose of this quality improvement (QI) project was to facilitate the identification of morbidly obese patients with BMIs greater than 35% in a primary care setting and provide a weight-loss toolkit for patients to promote weight loss and reduce obesity-related risk factors.

Review of Current Evidence

Obesity and Comorbidities

Approximately 80 million people (roughly 33%) in the US are affected by obesity and comorbidities, with an expected increase to over 50% of the population by 2030 (Andolfi & Fisichella, 2018). Weight gain can be attributed to the increased intake of sugar, carbohydrates, and sodium and the overall increase in consumed foods (Marengo, 2019). Most comorbidities linked with obesity are diabetes, hypertension, hyperlipidemia, heart disease, vascular disease, respiratory issues, joint disease, mental health issues like depression and anxiety, and strokes (AAPC, 2022; Andolfi & Fisichella, 2018; CDC, 2022; Fruh, 2017; Kyrou et al., 2018). Significant advances have been made in imaging modalities for characterizing body composition, including visceral adiposity; the studies that quantify fat depots, including ectopic fat, support excess visceral adiposity as an independent indicator of poor cardiovascular outcomes (Powell-Wiley et al., 2021).

Accuracy of Obesity Documentation

Clinical documentation is paramount to code selection for the provider's professional fee and the hospital's Medical Severity Diagnosis Related Groups (MS-DRG) reimbursement (McKean et al., 2017). The medical record must clearly document the primary diagnosis; each

treatment code actively describes the condition, contributing comorbidity and differential diagnosis to the highest specificity known (McKean et al., 2017). Not documenting the correct ICD 10 code or correctly charting the "problem" during a patient care visit can result in billing issues and issues for the patients and the corporation under which the clinic is actively practicing (McKean et al., 2017). Often there may be more than one diagnosis responsible for admission, and in this circumstance, ICD rules allow for the provider or the coder to select the principal diagnosis that is most beneficial for reimbursement; however, that selection must be supported by documentation in the chart (McKean et al., 2017).

Researchers have found that electronic prompts regarding BMI not only improved the rates of obesity documentation but, more importantly, increased the frequency of patient visits and the rate of weight loss counseling (Mattar et al., 2017). However, these studies also suggest that obesity documentation rates remain low, and a recent review of EHR studies has shown that there may not be enough tools for providers to use in addressing and screening overweight and obese patients (Mattar et al., 2017). Obesity isn't coded as frequently as it should be by primary care providers. Even though it is known to be a problem with other co-morbidities, physicians still are not documenting obesity even if the patient is morbidly obese (Mattar et al., 2017). The ICD-10 code range for BMI includes Z68-Z68.54 as the medical classification listed by the World Health Organization (WHO) (WHO, 2022).

Specific BMI codes are used to document different categories of obesity for patients ages 20 and older (Morrow, 2022). A patient with a BMI of 35.0 would be considered obese and would prompt the use of the ICD-10 code Z68.35 and so forth based on the BMI category in which the patient fell (Morrow, 2022). (See Appendix A for a List of BMO Codes) If comorbidity is associated with obesity, then there would be an additional ICD-10 code associated

with the BMI ICD-10 code, and a more well-developed plan for weight loss and treatment would then be addressed (Mainous et al., 2022).

Obesity Education for Patients

Providers have expressed that there is a gap in the nutritional education given to medical professionals, which increases the lack of education provided to obese patients (Baute et al., 2018). Providing education to patients plays a key role in patients understanding their health and adhering to medical advice (Groller, 2017) Giving foods that are eaten, times that the patient spends eating, portion sizes, and hunger cues promote healthy weight loss without having to be super strict in the diet and weight loss (Baute et al., 2018). When educating patients, it is important to inform them that the leading causes of death in America are heart disease, stroke, type 2 diabetes, and certain types of cancer; these are related to obesity and are often preventable (CDC, 2022). Providing obesity education can help reduce the expected increase of obesity-related comorbidities by 2025, which are approximately 20% for men and over 20% for women (Kyrou et al., 2018).

Conceptual Framework/Theoretical Model

This QI project will incorporate Lewin's three-stage change theory. Lewin was a social scientist and physicist who founded a simple framework for understanding the process of organizational change known as the three-stage theory, which he referred to as unfreeze, change (transition), and freeze (refreeze). This framework was implemented in the clinic to change how the providers worked through the three phases. Step one was preparing providers and assessing their knowledge base before education was provided. Step two involved implementing the change, including providing a toolkit and food scale for patients who met the criteria, and step three involved observing the process and sustaining the change (Burnes, 2019).

Methods

Design

This four-month QI project implemented an educational toolkit designed to promote weight loss in an adult primary and diagnostic patient care clinic utilizing a quantitative design to evaluate both primary and secondary outcomes.

Population

Participants of this QI project included providers at a local, privately owned primary care practice in rural NC. Inclusion criteria included providers with one-on-one contact with patients during annual well-visits and full access to patients' EHR. Exclusion criteria were providers in the practice who did not have direct access to patients in a private room or full access to the patient's EHR.

Patients presenting for their annual wellness visit were eligible for inclusion in the project if they were at least 20 years of age, had a BMI greater than 35%, and were determined by the provider to be good candidates for the intervention. Exclusion criteria included patients with gastrointestinal disorders who might be unable to change their diets or ways of eating, those with severe heart or lung disease who may be unable to consume increased amounts of water, those with severe kidney disorders, and some cancer patients depending on the patient and providers' judgment.

Setting

The project site was a local, privately owned primary care practice in rural NC that follows all protocols and procedures set forth by the governing state and federal government for the safety and care of the patients that receive primary care at the practice.

Interventions

A toolkit was designed, which included a food scale and booklet that contained the do's and don'ts of weight loss, food portions, meal planning, frequent small meal guide, food substitutions, and food and weight logs., Physical activity recommendations were given by the provider to patients with a BMI of 35% or greater. A meeting was held with the providers who met the inclusion criteria and were willing to participate in the QI project. Providers were educated on all components of the toolkit and asked to give the toolkit to patients who met inclusion criteria. Toolkits were placed on a bookshelf in an open storage area beside the provider's office. Providers addressed a BMI greater than 35% at the time of the well-visit and provided a handout of the calculated results and BMI categories to the patient. The provider also gave verbal education on the toolkit provided. Providers updated the BMI and BMI ICD-10 code in the EHR and documented that education was given.

ICD-10 code Z68.35 classified patients who fell into the BMI category of 35% or greater. If weight and BMI were higher, the associated ICD-10 code was documented by the provider in the EHR (see Appendix A). Discussion with the providers on how the ICD-10 code Z71.89, a medical classification listed by WHO, could also be listed in the patient's EHR to document how specified weight reduction counseling strategies were utilized with the patient during the annual visit (AAPC,2022).

Data Collection

After a four-month implementation phase, data was collected and stored in an excel spreadsheet using a password-protected computer. The following information was obtained: age, gender, BMI, appropriate ICD-10 code based on the patient's current BMI, and whether education was documented as given in the EHR. This information was collected both pre- and

post-implementation using a retrospective chart review. Intellectus Statistics analysis software was used to analyze data.. (See Appendix B for Pre-Implementation Data and Appendix C for Post-Intervention Data)

Data Analysis

Descriptive statistics were used to analyze pre-and post-intervention BMI levels, gender, age, weight gain, loss, or maintenance, and whether education was documented or not by the provider. A Kruskal Wallis rank test was conducted to assess if there were significant differences in pre- and post-implementation BMI levels. A Chi-Square test of independence was conducted to determine if pre-BMI and post-BMI were independent. McNemar's Chi-Square test was conducted to determine if there was a significant difference between the frequencies of documented education pre-and post-intervention.

Results

Summary statistics were calculated for the gender and age of participating patients. The average age was 65.70 and males and females were equally represented n=10 (males) n=10 (females). (See Table 1 for summary statistics related to age).

Table 1

Summary Statistics Table for Age of Patients

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
Age of patients	65.70	11.95	20	2.67	41.00	83.00	-0.58	-0.50

Note. '-' indicates the statistic is undefined due to constant data or an insufficient sample size.

The observations for pre-implementation BMI had an average of 37.29 (SD = 2.88, SEM = 0.64, Min = 32.00, Max = 43.00, Skewness = 0.39, Kurtosis = -0.63). The average observation

for post-implementation BMI was 38.91 (SD = 5.48, SEM = 1.22, Min = 29.40, Max = 57.20, Skewness = 1.59, Kurtosis = 4.60).

Data was analyzed to compare the frequency of documented education pre- and post-implementation. Analysis of data for pre-implementation documentation of education showed YES (n = 8, 72.7%) and NO (n = 3, 27.3%). Analysis of data for post-implementation documentation showed YES (n = 11, 55%) and NO (n = 9, 45%).

When observing if the toolkits were documented as given to patients, data revealed an increase in education provided as 16 patients or 80% had documentation of receiving toolkits. Four patients or 20% in the study did not have documentation of receiving a toolkit. (See Table 2 for Frequency of Documentation of Toolkits Given)

Table 2

Frequency Table for Documentation of Whether Toolkits Were Given to the Patient by the Provider

Variable	*n*	*%*
Toolkit given		
YES	16	80.00
NO	4	20.00

Note. Due to rounding errors, percentages may not equal 100%.

McNemar's chi-square test for 2 x 2 contingency tables were conducted to test the hypothesis that the outcome proportions of education documentation before and after implementation. The test results were not insignificant based on an alpha value of .05, $\chi 2(1) = 0.20$, $p = .655$, suggesting the proportions for each outcome were not significantly different. The results are presented in Table 3.

Table 3

Observed Frequencies of Education Documented in EHR by Pre and Post Implementation

	Was education documented post				
Was education documented Pre	YES	NO	χ^2	*df*	*p*
YES	8	2	0.20	1	.655
NO	3	7			

A chi-square test of independence was conducted to examine whether pre-BMI and post-BMI were independent. The Chi-square test results were not significant based on an alpha value of .05, $\chi2(98) = 107.73$, $p = .236$, suggesting that pre-BMI and post-BMI could be independent of one another.

A Kruskal-Wallis rank sum test was conducted to assess if there were significant differences in the BMI pre- and post- implementation of the project based on retrospective chart reviews. The results of the Kruskal-Wallis test were not significant based on an alpha value of .05, $\chi2(2) = 3.38$, $p = .185$, indicating that the mean rank of BMI was similar for each level of weight loss documented after the implementation. Table 4 presents the results of the Kruskal-Wallis rank sum test. Figure 1 shows boxplots of the ranked BMI values by the weight loss levels documented after the implementation.

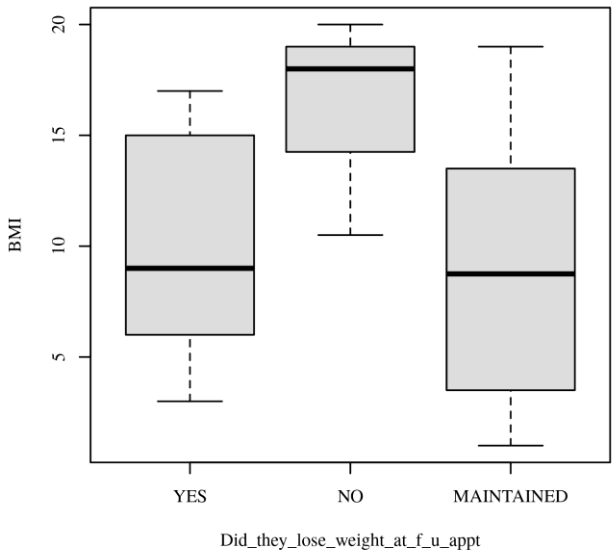
Table 4

Kruskal-Wallis Rank Sum Test for BMI "Did they lose weight at follow-up appointment?"

Level	Mean Rank	χ^2	*df*	*p*
YES	10.00	3.38	2	.185
NO	16.17			
MAINTAINED	8.94			

Figure 1

Ranked Values of BMI by the levels of "Did they lose weight at follow-up appointment"



Discussion

The average age of patient participants was 65.70 and males and females were equally represented. After the implementation of the project, the average BMI was 38.91, which is an increase from the pre-implementation BMI of 37.29. Even though toolkits were given to patients with a BMI>35%, there was not a significant improvement in the education being documented, as only 55% was documented, leaving 40% of the participants having no documentation of weight loss education. Evidence from previous studies has shown that even when the providers are prompted, documentation of education remains low (Mattar et al., 2017). The McNemars chi-square test performed did not show a significant difference in the documentation of weight loss education.

Patients who participated in the study had no improvement in weight loss and weight management. Based on literature reviews, comorbidities are associated with obesity. The

presence of comorbidities would indicate the need for additional ICD-10 codes associated with the BMI ICD-10 code, and a well-developed plan for weight loss and treatment to be addressed (Mainous et al., 2022). This is associated with providers needing to learn how to translate nutrition or weight loss education into terms and information for patients to understand (Berger, 2017).

Ethical Considerations

This project was approved by the Institutional Review Board (IRB) of Lenoir-Rhyne University in Hickory, N.C. All participants were protected by the Health Insurance Portability and Accountability Act of 1996. No individual identifying information or data was collected or used in reporting results. There were no risks for patients or providers associated with this project.

Limitations

Project limitations included a small sample size in a single practice in N.C. As the project was related to weight loss and management, having a relatively short implementation period may have impacted weight loss results. An additional limiting factor was related to a change in the provider lead in the clinic related to a health issue.

Conclusion

Weight loss education and appropriate documentation continue to be a challenge for providers based on current evidence (Mattar et al., 2017). Weight loss management is critical to health for patients with a BMI greater than 35% as there are significantly increased risks of comorbidities such as heart disease and diabetes (Baute et al., 2018). After the toolkits were implemented in this project, patients' BMIs increased by 1%; even though the project was found

to be helpful by providers and participants. This may be related to patients' readiness to engage in weight loss.

Providers expressed interest in continuing similar educational resources for patients in the future, improving the education they provided, and updating the correct BMIs in the EHR. Providing weight loss education to patients is critical to help them gain control and improve their overall health. Education related to improvements in nutritional and physical activity levels for overweight individuals can reduce obesity and its associated comorbidities. It is imperative for providers to be knowledgeable, taking into consideration the timeliness of the education and incorporating evidence-based practices (Walsh et al., 2019).

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Appendix A

BMI	Range	BMI Codes
<18.5	Underweight	Z68.1
18.5 to 24.9	Healthy	Z68.1-Z68.24
25.0 to 29.9	Overweight	Z68.25-Z68.29
30.0 to 34.9	Obese	Z68.30-Z68.34
35.0 to 39.9	Obese	Z68.35-Z68.39
=>40	Obese(severe)	Z68.41-Z68.45

Appendix B
Pre-Implementation Data

Toolkit	Age of patients	Gender	BMI	BMI ICD 10 charted	F/U appt made	was education documented	Risk factors
1	63	F	40	Z68.41 (40)	YES	YES	HTN, GERD
2	64	F	35	Z68.22 (22)	NO	NO	GERD, HTN
3	81	F	35	Z68.41 (40)	YES	NO	HTN
4	71	F	40	Z68.41 (40)	YES	YES	COPD, HTN, DM
5	57	F	35	Z68.29 (29)	YES	YES	GERD, Depression
6	83	M	35	Z68.29 (29)	YES	NO	ISCHEMIC HEART, HTN, Prostate CA
7	67	M	35	Z68.30 (30)	NO	NO	ED, OSA, A-flutter
8	72	M	38	Z68.38 (38)	NO	NO	CKD, HYPERLIPIDEMIA, HTN
9	65	F	32	Z68.30 (30)	YES	NO	HTN
10	66	F	37	Z68.38 (38)	YES	YES	HTN, DM
11	73	F	40.5	Z68.39 (39)	YES	YES	HYPERLIPIDEMIA, HTN, DM
12	65	F	42.3	Z68.41 (40)	NO	YES	DM, GERD
13	85	F	36	Z68.37 (37)	NO	NO	HYPERLIPIDEMIA, CKD
14	82	F	35	Z68.37 (37)	NO	YES	CAD, HTN, CKD, DM, GERD
15	71	F	35	Z68.35 (35)	NO	NO	HYPERLIPIDEMIA, HTN, DM
16	54	F	43	Z68.41 (40)	YES	YES	HTN, GERD, HYPERCHOLESTERMIA
17	59	M	37	Z68.35 (35)	YES	YES	LDL ELEVATED, HTN, DM
18	73	F	40	Z68.39 (39)	YES	YES	CHF, HTN, DM, GERD

19	79	F	37	NONE CHARTED	YES	NO	HYPERLIPIDEMIA, HTN, TAKOTSUBO CARDIOMYOPATHY
20	83	M	38	Z68.41 (40)	YES	NO	HTN, CKD, DM, AFIB

Appendix C
Post-Implementation Data

Toolkit	Age of patients	Gender	BMI	BMI ICD 10 charted	F/U appt made	Toolkit given	was education documented	Risk factors	Actual Weight/Height
1	49	M	34	Z68.34	YES	YES	YES	HTN, GERD, CAD	267lbs/6'2"
2	81	F	35	Z68.35	YES	YES	YES	DMII, GERD, HTN	207lbs/5'4"
3	74	F	42.3	Z68.41 (IC)	NO	YES	NO	DMII, GERD, HTN,CKD	271lbs/5'7"
4	65	F	38.6	Z68.38	YES	YES	NO	HYPERLIPIDEMIA	232lbs/5'5"
5	57	M	29.4	Z68.29	YES	YES	YES	PROSTATE CA	235lbs/6'3"
6	63	F	38.6	Z68.38	YES	YES	YES	CAD, ISCHEMIC HEART, HTN	218lbs/5'3"
7	81	F	32.2	Z68.32	NO	NO	NO	HYPERLIPIDEMIA	182lbs/5'3"
8	66	F	40.2	Z68.40	YES	YES	NO	HTN, GERD, CAD	206lbs/5'2"
9	74	M	40.3	Z68.40	NO	YES	NO	HYPERLIPIDEMIA, HTN, CAD	297lbs/6'0"
10	67	M	41.6	Z68.41	NO	NO	YES	CAD, HTN	298lbs/5'11"
11	50	M	35.1	Z68.35	YES	YES	YES	HYPERLIPIDEMIA, HTN, CAD	266lbs/6'1"
12	41	F	42.9	Z68.40 (IC)	YES	YES	YES	CKD, HYPERLIPIDEMIA	266lbs/5'6"
13	75	M	38	Z68.38	NO	YES	NO	HTN, GERD, CAD	269lbs/5'10"

14	67	M	37	Z68.37	YES	YES	YES	HTN, GERD, CAD	288lbs/6'2"
15	45	F	38.2	Z68.38	NO	YES	YES	HYPERLIPIDEMIA, HTN	209lbs/5'2"
16	66	M	40.1	Z68.40	NO	NO	NO	HTN, GERD, CAD, DMII	312lbs/6'2"
17	71	F	57.2	Z68.54 (CORRECT)	YES	YES	YES	HTN, GERD, CAD	323lbs/5'3"
18	83	F	39.1	Z68.38 (IC)	YES	YES	YES	HYPERLIPIDEMIA, HTN, CAD,CKD, DMII	221lbs/5'3"
19	67	M	38.5	Z68.38	YES	YES	NO	HYPERLIPIDEMIA, HTN, CAD	316lbs/6'4"
20	72	M	40	Z68.40	NO	NO	NO	HTN, GERD, CAD	295lbs/6'0"