

3-16-2015

Improving Provider Identification and Management of Overweight and Obesity in Primary Care

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Improving Provider Identification and Management of Overweight and Obesity in Primary Care

Sarah Knoeckel BSN, MSN, APRN-BC

University of Connecticut, 2015

Abstract

Background: Overweight and obesity are in epidemic proportions in the United States. This is alarming given that obesity is a risk factor for many secondary health conditions. Primary care providers (PCPs) are responsible for weight management interventions in clinical settings, yet obesity treatment guidelines are infrequently applied in practice. **Purpose:** The purpose of this study was to examine PCPs' attitudes, beliefs, and behaviors as they relate to overweight and obesity guidelines in light of the *Theory of Planned Behavior*. **Methods:** A randomized controlled trial design was used. Participants included PCPs that care for adult patients employed at a federally qualified health center (FQHC) in the Northeast. Twenty-seven PCPs participated in the study. Data was gathered using an attitude and barrier questionnaire before and after the multifaceted intervention strategy. Performance data was also gathered using the electronic health records for documentation of overweight and obesity identification and management at baseline and monthly for five consecutive months. The multifaceted intervention strategy included an interactive educational workshop, educational outreach visits, and performance measurement and feedback of patient care data. **Results:** Results of the study for the questionnaire showed no significant change in responses from pre to post. Results for the performance showed an improvement in identification in the intervention group from pre (10%) to post (13%) ($p < 0.284$), whereas the control group remained similar from pre (9%) to post

Sarah Knoeckel- University of Connecticut, 2015

(9.5%) ($p = 0.895$). Results for the performance showed improvement in management in the intervention group from pre (10%) to post (15%) ($p < 0.01$), whereas the control group remained similar from pre (5%) to post (7%) ($p = 0.273$). **Conclusion:** Many FQHC PCPs do not routinely provide weight management treatment for obese patients. PCPs greatest reported barriers were lack of time during encounter, lack of motivation among patients and lack of ancillary resources. The multifaceted intervention strategy used was found to be effective at improving obesity management.

Improving Provider Identification and Management of Overweight and Obesity in Primary Care

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A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Nursing Practice

at the

University of Connecticut

2015

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APPROVAL PAGE

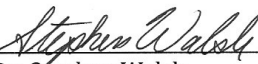
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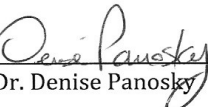
Improving Provider Identification and Management of Overweight and Obesity
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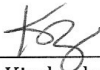
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Dedication

I would like to dedicate this to my family. Without your support and love during these past five years I probably would not have finished. I would like to thank my husband, Edward, for his encouragement and patience as I worked through my doctoral program. I am also grateful to my mother and father, and my in-laws for their help during this process. Finally, I would like to thank my Lord and Savior for the strength and perseverance he has given me to endure until graduation.

Acknowledgment

I wish to acknowledge the Community Health Center, Inc. for your support in allowing me to implement my study. A special thanks to Dr. Margaret Flinter, Dr. Veena Channamsetty, and to Ianita Zlateva for their direction with my research study and for their advice with implementation strategies. I share with them a passion for the art of caring for underserved patients and without their support could not have completed this study.

I wish to thank Dr. Stephen Walsh, Dr. Sandra Bellini, Dr. Douglas Olson, Dr. Kimberly Joerg and Dr. Denise Panosky for all their time and support. As part of my research committee, each of you served as an integral part in the success of this study.

I would especially like to thank Dr. Thomas Van Hoof. As my major advisor, your guidance and patience were endless. Your mentorship through this process has been of inestimable value. You have taught me so much. I share your vision for health education and quality improvement and hope to carry it forward.

Table of Contents

Abstract	
Title Page.....	i
Copyright Page.....	ii
Approval Page	iii
Dedication.....	iv
Acknowledgements.....	v
Table of Contents.....	vi
List of Figures.....	ix
List of Tables.....	x
Body of Dissertation.....	1
Chapter One: Introduction.....	1
Background of the Problem.....	9
Significance.....	15
Purpose of Practice Change.....	18
Theoretical Framework.....	19
Study Questions.....	21
Definition of Key Terms/Variables.....	21
Summary.....	23
Chapter Two: Literature Review.....	24
Introduction.....	24

Theoretical Literature.....	26
Empirical Literature.....	30
Summary.....	40
Chapter Three: Methodology.....	42
Introduction.....	42
Setting.....	44
Resources.....	44
Inclusion and Exclusion Criteria.....	45
Sample.....	45
Recruitment Methods.....	46
Protection of Human Subjects.....	47
Procedures involved in Research.....	48
Instruments.....	52
Analysis.....	57
Study Questions.....	57
Summary.....	59
Chapter Four: Results.....	61
Description of the Sample.....	61
Analysis of Research Questions.....	63
Summary.....	80
Chapter Five: Discussion.....	82
General Considerations.....	82
Discussion of Research Questions.....	85

Evaluation of Theoretical Model.....	92
Implications for Practice.....	94
Limitations.....	96
Summary.....	99
References.....	101
Appendix A: Consent to Participate in Research Project.....	113
Appendix B: PCP Demographic Information.....	115
Appendix C: PCP Attitude About Obesity.....	115
Appendix D: Barriers to Discussion and Management of Obesity.....	116
Appendix E: Obesity Identification and Management Presentation	117
Appendix F: IRB Approval.....	119

List of Figures

Figure 1. Map of Obesity Percentile by State	10
Figure 2. Theory of Planned Behavior Model	20
Figure 3. Proportion of PCPs' patient encounters that had Obesity Identification documented by Time Period and Group.....	78
Figure 4. Proportion of PCPs' patient encounters that had Obesity Management documented by Time Period and Gro.....	80

Lists of Tables

Table 1. Weight Classification for Adults by BMI and Waist Circumference.....	4
Table 2. Approved FDA Drugs for Adult Obesity Treatment.....	7
Table 3. Non Approved Drugs for Treatment of Obesity.....	8
Table 4. Obesity Rates based on Poverty Level	12
Table 5. Obesity Rates based on Educational Levels	13
Table 6. Immigrant Obesity Rates	14
Table 7. Obesity Data Collection Tool for Performance Reporting Feedback	56
Table 8. Demographic Background Information by Group	63
Table 9. Mean Percentage (SD) Performance Data at Baseline	64
Table 10. Number (Valid Percentage) Agree with Attitude by Group at Baseline	66
Table 11. Number (Valid Percentage) Agree with Confidence in Discussing Treatments by Group at Baseline	67
Table 12. Mean (SD) Barriers to Addressing Weight by Group at Baseline	67
Table 13. Spearman Rank Correlation between Baseline Attitude Statements and PCPs’ Documentation (n=27)	69
Table 14. Spearman Rank Correlation between Baseline Confidence Statements and PCPs’ Documentation (n=27)	70
Table 15. Pearson Product Correlation between Baseline Barriers Statements and PCPs’ Documentation (n=27)	71
Table 16. Number (Valid Percentage) Agree with Attitude by Group at Follow-Up...	72
Table 17. McNemar P-Values for change from baseline to follow-up for Attitude Statements and Change in Percentage Agreement from baseline to follow-up by Group	73
Table 18. Number (Valid Percentage) Agree with Confidence in Discussing Treatments by Group at Follow-Up	74

Table 19. McNemar P-Values for change from baseline to follow-up for Confidence Statements and Change in Percentage Agreement from baseline to follow-up by Group.....	75
Table 20. Mean (SD) Barriers to Addressing Weight by Group at Follow-Up	76
Table 21. Paired t-test P-Values for change from baseline to follow-up for Barriers Statements and Degree of change in Mean from baseline to follow-up by Groups	77
Table 22. Mean (SD) Performance Data at Follow-Up	78

Chapter One

Introduction

The prevalence of obesity has dramatically increased in the United States over the past 20 years (Center for Disease Control (CDC), 2010). Obesity is, in fact, the most common metabolic disease and the most challenging health crisis our country has seen to date (Khan, 2011).

Currently, two-thirds of adults (roughly 190 million people) in the United States are obese or overweight (Trust for America's Health, 2010). Research has shown that obesity is a major risk factor for 20 major diseases including type 2 diabetes mellitus, hypertension, heart disease, high cholesterol, osteoarthritis, and certain cancers (Trust for America's Health, 2010). More disconcerting than obesity's high prevalence is its rising incidence in the United States.

Epidemiology studies show that the prevalence of adult obesity, measured by a body mass index (BMI) of ≥ 30 kg/m², has nearly tripled from 1990 to 2010, from 12% to 33% (CDC, 2010).

Persons of lower socioeconomic status have a higher prevalence of obesity.

Approximately 35.3% of adults whose income is less than \$50,000 are obese compared with 24.5% of people whose income is greater than \$50,000 (Weight-control Information Network (WIN), 2010). In addition, persons with lower annual incomes face more challenges in making healthier decisions. Demographically, families of low-income neighborhoods and communities often have less access to nutritious and affordable foods because there are typically smaller grocery stores with less produce available. These neighborhoods usually have higher rates of obesity (Ver Ploeg et al, 2012). Moreover, low-income families have less access to physical activity due to neighborhood safety concerns, lack of transportation, and the cost of activities such as gym memberships or sports leagues (WIN, 2010; Darmon & Drewnowski, 2008; Dubowitz, Acevedo-Garcia, Salkeld et al, 2007). In addition, obesity is significantly increasing

health care costs in the United States and producing a less productive work force, which also affects our ability to compete in the global economy (Khan, 2011). In 2008, the medical costs related to obesity were approximately \$147 billion dollars (Finkelstein, Trogdon, Cohen & Dietz, 2008). Primary care providers play a very important role in addressing obesity and its related problems with all populations, but special attention is needed among underserved, low-income populations.

Weight management and the role of the primary care providers

In this study, primary care providers (PCPs) refer to physicians, nurse practitioners, and physician assistants who care for adults and are specialized in family medicine or general internal medicine. These healthcare professionals serve as many patients' first point of entry into the health care system and as the continuing focal point for all needed health care services (American Academy of Family Physicians, 2012). PCPs are responsible for most of the weight management interventions in the clinical setting, including early identification of those at risk for obesity. Nevertheless, PCPs frequently lack the time and resources to apply obesity treatment guidelines as part of routine patient visits (Rutledge, Groesz, Linke, Woods & Herbst, 2011; Tsai & Wadden, 2009). Moreover, evidence reveals that PCPs have strong negative attitudes toward, and reactions to, obese patients (Salinas et al., 2010; Ferrante et al., 2009; & Jay et al., 2008).

A review of the literature describes multiple variables that act as barriers for PCPs to manage obesity. These variables include lack of time, lack of reimbursement, lack of educational materials, and lack of confidence and knowledge to counsel patients on weight loss (Ferrante et al., 2009; Persky & Eccleston, 2011; Salinas et al., 2011; Spivack, Swietlik, Alessandrini, & Faith, 2010). PCPs need to overcome various negative attitudes toward obesity and conquer barriers to effectively maximize obesity management.

PCPs play a major role in addressing the obesity epidemic. PCPs can decrease obesity within their practices by early identification and treatment. The literature consistently indicates that patients take seriously PCPs' health recommendations to increase physical activity and to lose weight (Smith et al., 2011; Yang, Lee, & Chasens, 2011). Even though the path to helping patients lose weight may seem unending, small steps represent significant milestones and research indicates that even a modest weight loss of 5-10% produces beneficial improvement in cardiovascular comorbidities (Vetter, Wadden, Chittams et al., 2013).

PCPs do not often feel competent to address obesity and frequently do not apply evidenced-based practice guidelines (Ferrante et al., 2009). Early identification of obesity and effective treatment approaches are critical in making headway against the destructive health complications and early mortality of obesity (Aronne, Wadden, Isoldi, & Woodworth, 2009; Brown, Fujioka, Wilson, & Woodworth, 2009). PCPs need to be well informed of the alternatives available for patients who want to lose weight.

First, PCPs need to identify overweight and obese patients, who are often under-identified and under-documented in medical records by 38-59% (Simkin-Silverman et al., 2008). Identification and documentation are important, as PCPs are more likely to provide obesity counseling to patients whom they identify as overweight or obese (Simkin-Silverman et al., 2008). Secondly, PCPs need to be competent with both education and evidenced-based practice guidelines to engage patients in weight loss plans through behavioral therapy and lifestyle modification in such areas as nutrition, diet, and physical activity (NHLBI Obesity Educational Intervention, 2000). This quality improvement (QI) study sought to address adult PCPs' attitudes, barriers, and knowledge deficit and to help PCPs improve their identification and management of obesity.

1. Methods of obesity identification to determine weight status:

a. Body mass index (BMI) is the most widely used method to determine weight status and is calculated for adults by the ratio of weight to height in order to estimate the percentage of body fat (CDC, 2010). For adults, the BMI classification is determined by the World Health Organization (WHO), which defines overweight as a BMI between 25.0 kg/m² and 29.9 kg/m², obesity from 30.0 kg/m² to 34.9 kg/m², severely obese from 35.0 kg/m² to 39.9 kg/m², and morbidly obese above 40 kg/m² (Table 1) (WHO, 2011).

Table 1. *Weight classification for adults by BMI and Waist Circumference*

	BMI (kg/m²)	Obesity class	Waist Circumference (risk for metabolic complications relative to normal weight and waist circumference)	Waist to Hip Ratio
			Men > 40 in. Women > 35 in.	Men ≥ 0.90 Woman ≥ 0.85
Underweight	<18.5			
Normal	18.50-24.9			
Overweight	25.0-29.9		Increased	High Risk
Obese	30.0-34.9	I	High	
	35.0-39.9	II	Very High	
Extremely (morbid) obese	>40	III	Extremely High	

NHLBI Obesity Education Initiative (2000) and WHO (2011)

b. Waist circumference and waist to hip ratio: In 2000, the World Health Organization (WHO) and National Heart, Lung, and Blood Institute (NHLBI) established the latest obesity practice guidelines and also based diagnosis of obesity in adults on waist circumference and waist to hip ratio (Table 1). In 2009, the International Chair on Cardiometabolic Risks, a group of experts in cardiology and endocrinology, met to develop a consensus statement for the diagnosis of metabolic syndrome. A large part of the meeting was to discuss the diagnosis of abdominal obesity. They determined that measuring waist circumference was an important

aspect of diagnosing obesity and metabolic syndrome because abdominal obesity is a predisposing factor to cardiovascular disease, type 2 diabetes, and stroke (Silva, 2013; WHO, 2011). Studies have shown that an elevated waist circumference can predict an increased risk of complications beyond simple BMI (Katzmarzyk, 2013; Ostchega, 2012). Unfortunately, the measure of waist circumference is not widely incorporated into routine practice (Simkin-Silverman et al., 2008).

Two methods are used to measure waist circumference. The World Health Organization determined it should be measured “at the approximate midpoint between the lower margin of the last palpable rib and the top of the iliac crest” (WHO, 2008). On the other hand, the NHLBI practice guide to obesity specifies waist circumference as a measurement at the top of the iliac crest (NHLBI Obesity Education Initiative, 2000). Hip circumference should measure around the widest portion of the buttocks (WHO, 2011). One can calculate the waist to hip ratio by dividing the waist circumference by the hip circumference (WHO, 2011). Both waist circumference and waist to hip ratio indicate similar risk factors, but the waist circumference is favored in clinical practice over waist to hip ratio as it is easier to measure and to calculate (Table 1) (WHO, 2011). In adults 75 years or older, the waist to hip ratio is considered to be a more accurate predictor of mortality risk (Price, Uauy, Breeze, et al., 2006).

In summary, the two primary methods the literature consistently promotes to categorize weight status and obesity identification are a body mass index (BMI) and waist circumference. Although the most commonly used method to categorize weight in clinical practice is the BMI, when both methods are employed they offer a more comprehensive analysis of weight category and cardiometabolic risks.

2. Primary care interventions to achieve weight loss

PCPs have multiple ways to treat obesity within the adult population. These interventions are divided into four main categories: counseling in an office-based setting at an appointment, pharmacologic management (weight loss medications), referral to multi-disciplinary care (such as a dietician, an exercise group, or a weight loss group), and referral for bariatric surgery. Each one of these modalities offers advantages and drawbacks and deserves further explanation.

a. Counseling and discussion in an office-based setting at an appointment

PCPs can discuss weight management in the office at an appointment encouraging a modest 10% weight loss from patients over six months. Such a weight loss would result in significant medical benefits and should be considered a clinical success (Simkin-Silverman, 2008; Wolf & Woodworth, 2009; National Institutes of Health, National Heart, Lung and Blood Institute, 2000). Research shows that a 10% weight loss can extend life expectancy by two to seven years and reduce the annual medical cost by \$2,200-\$5,300 dollars (Forman-Hoffman et al., 2006).

PCPs ought to counsel overweight and obese patients about their BMI and associated risk factors. When counseling patients, PCPs should follow the five A's: Ask, Advise, Assess, Assist, and Arrange (Alexander et al., 2011). Healthy nutrition, physical activity, and lifestyle changes should be discussed as PCPs educate patients (Jay et al., 2008). In addition, it is advisable that PCPs encourage patients to follow-up regularly for accountability, support, and goal setting (Jay et al., 2008). Furthermore, a team based approach for weight management is beneficial, therefore, PCPs should recommend patients to pursue other community resources for weight loss. Finally, PCPs can also consider medications, referral to a registered dietician or to an exercise program, and/or bariatric surgery as addressed below (Jay et al., 2008).

b. Pharmacologic management

Weight loss medications can also lead to modest improvement in weight (Table 2 and Table 3). However, such drugs cannot stand-alone but must be used in conjunction with physical activity and dietary changes (Dickerson, 2009; Nader & Kumar, 2012). PCPs should not recommend pharmacotherapy until overweight and obese patients first attempt six months of lifestyle modifications. It should also be remembered that medication options remain controversial because they carry significant risks and often result in patients regaining weight after discontinuing such medications (Dickerson, 2009; Nader & Kumar, 2012).

Table 2. *Approved FDA Drugs for Adult Obesity Treatment*

Weight-loss drug	How it works	Common side effects
Orlistat Sold as Xenical by prescription Over-the-counter sold as Alli	Blocks some of the fat eaten, keeping it from being absorbed by the body.	Stomach pain, gas, diarrhea, and leakage of oily stools Note: Rare cases of severe liver injury reported
Lorcaserin Sold as Belviq	Acts on the serotonin receptors in the brain. Helps patients eat less and feel full after eating smaller amounts of food	Headaches, dizziness, feeling tired, nausea, dry mouth, cough, and constipation
Phentermine Note: Only FDA approved for a short period of time (up to 12 weeks)	Increases chemicals in the brain that affect appetite	Dry mouth, difficulty sleeping, dizziness, headache, feeling nervous, feeling restless, upset stomach, diarrhea, and constipation
Phentermine-Topiramate Sold as Qsymia	A mix of two drugs: Phentermine (appetite suppressant) and Topiramate (used to treat seizures or migraine headaches) Decreases appetite and makes food taste less appealing	Tingling of hands and feet, dizziness, taste alterations (particularly with carbonated beverages), trouble sleeping, constipation, and dry mouth May lead to birth defects

(Weight-control Information Network, 2013)

Table 3. *Non Approved Drugs for Treatment of Obesity*

Category	Medication Name
Diabetic agents	Metformin
	Exenatide (Byetta)
	Pramlintide (Amylin)
	Liraglutide
Antidepressants	Bupropion
	Venlafaxine (Effexor)
	Desvenlafaxine (Pristiq)
	Lamotrigine (Lamictal)
	Fluoxetine
Anticonvulsants	Zonisamide
	Topiramate

(Bray, 2013)

c. Referral to multi-disciplinary care (dietician, exercise group, etc)

Weight loss is challenging and has been shown to usually have better long-term sustainable outcomes if approached with a multidisciplinary team. Patients can significantly benefit from support from experts in nutrition, exercise, and behavioral interventions, in addition to seeing their PCPs (Laddu et al., 2011). Different alternatives have been shown to be effective either through individual sessions or in groups.

Commercial exercise and/or weight loss programs have also helped many individuals achieve their weight loss goals. A few examples of such programs are Weight Watchers, South Beach Diet, and Slim-Fast. Nevertheless, these commercial weight loss programs have not been carefully researched and compared for which PCPs do not have substantial evidence to support one program over another (Laddu et al., 2011). PCPs who are familiar with a specific program and are able to support it with the evidence available can also recommend certain programs to patients as a method to assist with weight loss.

d. Bariatric surgical intervention

Bariatric surgery is a more aggressive and effective method of weight loss for morbidly obese adults and adolescents. Although not without risks, it has been shown to be the most effective weight loss alternative for people with a BMI above 40 kg/m^2 (Nader & Kumar, 2012; Ward, 2009). However, despite the evidence of its effectiveness, it is not frequently recommended by PCPs (Ferrante et al., 2009; Forman-Hoffman, Little, & Wahls, 2006; Foster et al., 2003). According to Foster et al. (2003), bariatric surgery is recommended infrequently (37.4% of the time) on account of three factors: (1) providers are not sufficiently educated about the potential benefits of surgery, (2) they believe the risks outweigh the benefits, and (3) they do not have a referral mechanism with a qualified surgeon.

In conclusion, even though lifestyle interventions, behavioral therapy, and pharmacotherapy offer a modest weight loss of five to ten pounds (Dickerson & Carek, 2009; Aronne, Wadden, Isoldi et al., 2009), long-term weight loss is still elusive for many patients, as 50% of patients return to baseline weight after five years (Aronne, Wadden, Isoldi et al., 2009). PCPs need to enhance their role in weight gain prevention and to provide regular follow up with patients who have lost some weight through initial efforts (Simkin-Silverman et al., 2008).

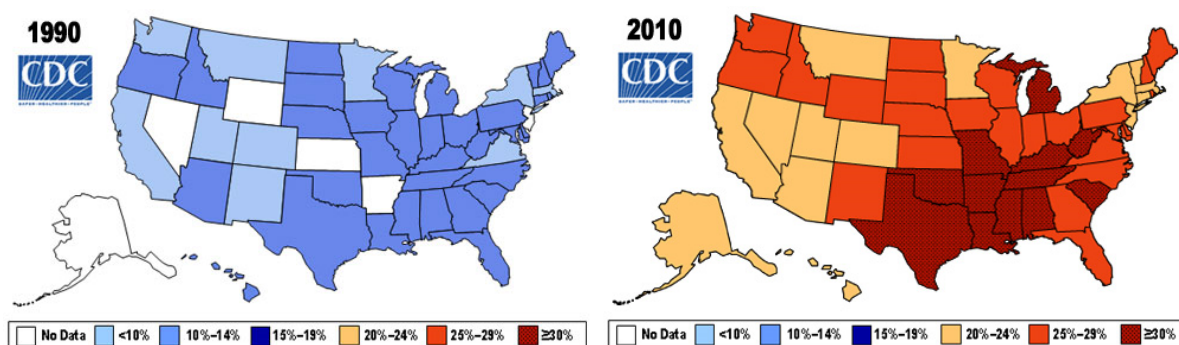
A. Background of Problem

Epidemiology of Obesity in the United States

The National Health and Nutrition Examination Survey (NHANES) estimates that 34.2% of adults in the United States are overweight (BMI above $\geq 25 \text{ kg/m}^2$), 33.8% are obese (BMI $\geq 30 \text{ kg/m}^2$), and 5.7% are morbidly obese (BMI $\geq 40 \text{ kg/m}^2$) (Flegal, Carroll, Ogden, & Curtin, 2010). Unfortunately, the prevalence of obesity is also increasing in children primarily due to dramatic changes in lifestyle, such as increased fast food consumption, and decreased physical activity (see Figure 1). Obesity during adolescence is an important factor, as an elevated BMI at

age 14 has been shown to be the most accurate predictor of adult obesity (Formiguera & Cantón, 2004).

Figure 1. *Map of Obesity Percentile by State*



CDC/NCHS, National Health and Nutrition Examination Survey (1988-1994 and 2009-2010)

Since the 1980s, national obesity rates have increased from 23% to 34% despite the Healthy People 2010 objective to reduce obesity to below 15% of the population (see Figure 1) (Ogden & Carroll, 2010). Furthermore, not a single state reported meeting the Healthy People 2010 objective to reduce obesity rates to below 15% (Sondik, Huang, Klein & Satcher, 2010). The Healthy People 2010 progress report noted that the lack of improvement and worsening statistics for obesity was the most disappointing finding of all the objectives for 2010 that the authors had set, as increased rates of obesity will contribute to increased rates of other related chronic diseases, and increase the national healthcare costs (Sondik, Huang, Klein & Satcher, 2010).

Based on its data, the CDC has determined that obesity needs to be addressed more comprehensively nationwide. This means improving individual nutrition, physical activity, and the environments that affect people's behaviors such as parks and sidewalks. The CDC strongly proposes that "new and continued national, state, and community-level surveillance of obesity,

its behavioral risk factors, and the environments and policies that affect these behaviors is critical to monitor progress in obesity prevention and to target interventions” (CDC, 2010).

Obesity Among the Underserved

Obesity is more prevalent in populations with lower education, income, and occupational levels. These disparities correlate with increased behavioral risks for smoking, physical inactivity, and poor diet (Singh et al., 2011). Research consistently indicates that racial and ethnic differences in morbidity and mortality are associated with socioeconomic factors (Jones-Webb et al., 2009; Scribner, Theall, Simonsen, Mason, & Yu, 2009).

People of lower socioeconomic status have lives that are different in almost every dimension which challenges a healthy lifestyle, and these include: childhood and educational experiences, marriage and family life, career and work, health care, neighborhood conditions, and leisure (Jones-Webb et al., 2009; Ogden, Lamb, Carroll, & Flegal, 2010; Scribner et al., 2009).

The relationship between socioeconomic status and racial and ethnic health disparities is a complex one (Do, Frank & Finch, 2012). Braveman et al. (2010) determined that for non-Hispanic whites, socioeconomic status more clearly correlates with health status than for other ethnic and racial groups. On the other hand, among Hispanics and African Americans, the relationship between socioeconomic status and disease and mortality is much less predictable (Braveman et al., 2010)

Four factors contribute to the underserved obesity epidemic: income, race, education, and immigration status. These will be described in more detail.

1. Income

In adults, there is a clear pattern relating poverty and obesity in the overall population and in the white and black populations, however, there is not such a clear pattern in the Mexican American population (Table 4) (Braveman, 2010). These inconsistencies are mainly related to different patterns of nutrition and lifestyle. Furthermore, different populations in different contexts, such as rural verses urban, can carry with them a different set of modifying factors (Braveman, 2010).

Table 4. *Obesity Rates based on Poverty Level*

Obesity (age \geq 20 years)	Family Income as Percentage of Federal Poverty Level (FPL) (95% CI)				
	< 100%	100%–199%	200%–299%	300%–399%	\geq 400%
All	35.6 (32.9, 38.3)	34.6 (32.1, 37.3)	35.4 (32.1, 38.7)	31.2 (27.7, 35.0)	26.7 (24.4, 29.2)
Black	39.9 (34.8, 45.3)	42.5 (38.2, 47.0)	47.4 (41.3, 53.5)	36.9 (30.9, 43.3)	37.3 (32.8, 42.1)
Mexican American	34.6 (30.1, 39.5)	31.0 (26.6, 35.7)	34.9 (30.2, 39.9)	38.4 (33.1, 44.1)	36.5 (31.1, 42.2)
White	34.2 (30.7, 37.9)	33.6 (30.0, 37.4)	33.4 (29.3, 37.8)	30.3 (26.2, 34.7)	25.7 (23.2, 28.3)

(Braveman, 2010)

2. Race

In 2007-2008, the NHANES calculated the prevalence of obesity among adult men and women within different ethnic groups. The obesity prevalence with men was as follows: 31.9% of non-Hispanic white men were obese, compared to 37.3% of non-Hispanic black men and 34.3% of Hispanic men (Flegal, Carrol, Ogden & Curtin, 2010). For women, the trends indicated 33.0% of non-Hispanic whites were obese, compared to 49.6% of black women, and 43.0% of Hispanic women (Flegal et al., 2010).

3. Education

Among adults there is a clear correlation between lower educational level and obesity in all-racial groups (Braveman, 2010) (Table 5). Adults who have not graduated from high school have an average BMI of 34.7 kg/m², compared to college graduates who have an average BMI of 24.9 kg/m². By race, there is also a great distinction between whites that have not graduated from high school having an average BMI of 31.5 kg/m², compared to whites that are college graduates with an average BMI of 23.8 kg/m². Between blacks and Mexican Americans we also see higher BMI's in non high school graduates than college graduates (Table 5) (Braveman, 2010).

Table 5. *Obesity Rates based on Educational Levels*

Obesity (age ≥ 20 years)	Educational Attainment (95% CI)			
	Not High School Graduate	High School Graduate	Some College	College Graduate
All	34.7 (31.9, 37.7)	33.6 (31.6, 35.6)	32.5 (29.9, 35.2)	24.9 (22.4, 27.6)
Black	41.9 (39.0, 44.9)	42.1 (37.3, 47.1)	40.3 (36.7, 44.0)	38.2 (32.9, 43.7)
Mexican American	34.0 (30.7, 37.4)	34.1 (28.5, 40.2)	33.7 (28.1, 39.9)	31.9 (24.6, 40.2)
White	31.5 (27.1, 36.2)	32.5 (30.2, 34.9)	31.3 (28.4, 34.3)	23.8 (21.1, 26.6)

(Braveman, 2010)

4. Immigration Status

The NHANES also calculated the prevalence of obesity among minorities, taking into consideration their ethnic group and their immigration status (Table 6). They defined “recent immigrants” as those who immigrated to the United States within 15 years and “long-term

immigrants” as those who immigrated more than 15 years ago (Singh, Siahpush, Hiatt & Timsina, 2011).

Table 6. *Immigrant Obesity Rates*

Obesity 2003- 2008	Recent Immigrant	Long-term Immigrant	U.S Born
Non-Hispanic White	25.0%	26.4%	27.1%
Non-Hispanic Black	25.9%	27.7%	28.9%
American Indian	---	---	28.9%
Chinese	22.6%	23.1%	24.3%
Other Asian/Pacific Islander	22.9%	24.2%	25.9%
Puerto Rican	27.3%	28.1%	28.3%
Mexican	26.6%	28.3%	28.6%

(Singh, Siahpush, Hiatt & Timsina, 2011)

According to Singh et al. (2011), immigrants’ risk for obesity has been shown to increase with time of residency in the United States. These findings have been attributed to acculturation into the United States, modifying immigrants’ health and behavioral risks to increase in similarity to those nationally born at the time of residence (Argeseanu Cunningham, Ruben, & Narayan, 2008; Dubowitz et al., 2007; Singh, Kogan, & Yu, 2009).

These different factors of income, education, race, and immigration status do not exist as singular. They are interconnected and additive. It is important to examine both race/ethnicity and socioeconomic factors (Braveman, 2010). The data demonstrates overall that blacks have a worse health outcome than whites at each level of income and education. This is possibly due to the adverse health effects of the urban life and blacks living in more concentrated disadvantaged neighborhoods (Braveman, 2010). As for Hispanics, there is a smaller gradient in obesity and health status based on socioeconomic status. However, the literature does not indicate health disparities in Hispanics based on nativity (Braveman, 2010).

Statistics also indicate that obese adults at lower income levels receive less advice from their PCPs about lifestyle and nutrition. A self-reported survey of 1,562 patients showed a clear correlation with PCPs giving more advice on nutrition and exercise to more educated patients (68.8%) and patients of higher socioeconomic status (SES) (20.8%) than to patients with less education (13.4%) and of lower SES (9.1%) (Sinclair, Lawson & Burge, 2008). In addition, there are ethnic disparities with access to health care. The insurance coverage varies substantially in relation to race and ethnicity, with 32% of Latinos, 30% of American Indians, and 22% of African-American lacking health insurance compared to 14% of whites (Kaiser, 2010).

A greater priority needs to be placed on addressing obesity within the minority and low-income populations. These communities especially need more resources for early identification of obesity and health promotion due to their increased risk for obesity and its health-related problems. More coordinated and integrated screening for obesity is needed in federally qualified health centers (FQHCs), which mainly serve low-income, uninsured, and racial and ethnic minority populations (National Association of Community Health Centers, 2009). A goal of this study was to encourage PCPs to identify obesity earlier in its course and to improve obesity management among adult patients within an FQHC organization.

B. Significance

Significance of QI Project to Nursing

This quality improvement project was significant to nursing as the principal investigator (PI) initiating the research is a family practice nurse practitioner. Nevertheless, the QI research was implemented among all the primary care providers that saw adult patients within a large FQHC. The PI was ideally suited to engage in this research as she brought to the table her nurse practitioner skill set. For over 45 years, nurse practitioners have provided high quality patient

centered care and have played a vital role in the primary care workforce (American Academy of Nurse Practitioners, 2011). Nurse practitioners have also assumed an increasing role in health care systems, especially for underserved populations (Newhouse et al., 2011).

A few essential core competencies for nurse practitioners include screening, health promotion and disease prevention (National Organization of Nurse Practitioner Faculties, 2011; Reiser & Schlenk, 2009). These competencies and skills are the cornerstone of obesity interventions, and enabled the PI to be well matched to carry out this research.

Pathophysiology of Obesity

Obesity is heterogeneous in its etiology but has a causal relationship between an imbalance in energy intake and energy expenditure (Korner, Woods, & Woodworth, 2009). Due to a long-term increase in caloric intake, excess energy is stored as fat. This long-term accumulation of excess fat contributes to metabolic changes such as insulin resistance, high cholesterol, and an inflammatory response that increases the risk for heart disease and type 2 diabetes mellitus (Schelbert, 2009; Korner et al., 2009). Obesity can cause diseases through two pathways: (1) the communication that fat cells produce between the hormones and the regulatory cytokines, and (2) subsequent mechanical adjustments that the body has to make related to excessive weight (Schelbert, 2009).

Obesity, specifically intra-abdominal obesity, increases the risk of cardiovascular disease due to hyperglycemia, high blood pressure, high cholesterol, intra-arterial plaque, and increased inflammation (Schelbert, 2009; Korner et al., 2009). Obesity also appears to be a direct cause of cardiomegaly, heart failure, and obstructive sleep apnea, the latter by repetitive airway collapse most notably in individuals with a neck circumference of 17 inches or greater (Schelbert, 2009; Jensen, 2011). In addition, gastrointestinal reflux, nonalcoholic fatty liver disease, and gallstone

formation are strongly related to obesity (Schelbert, 2009; Jensen, 2011). Furthermore, several malignancies, which are also related to obesity, include breast cancer, endometrial cancer, colon, rectal, prostate cancer, renal cell carcinoma, and other cancers (Schelbert, 2009; Jensen, 2011). Finally, the CDC estimates that 110,000 deaths per year are directly related to obesity (Trust in America's Health, 2010). All these co-morbidities decrease quality of life and contribute to a significant number of preventable deaths in the United States.

Economic Impact of Obesity

Obesity greatly increases costs for individuals, employers, insurance companies, and the government. The overweight and obese populations incur both direct and indirect costs for our nation. Direct costs involve medical expenses related to prevention, diagnosis, and treatment services. The indirect costs are due to morbidity expenses related to loss of income from decreased productivity, restricted activity, absenteeism, and mortality costs from lost income due to premature obesity related deaths (CDC, 2009).

Annually, the estimated medical costs for overweight and obese patients vary across different researchers' calculations, ranging from \$113.9 billion to \$209.7 billion dollars. Tsai et al. (2011) estimated that in 2010, the annual medical costs of obesity were \$113.9 billion dollars. However, Cawley and Meyerhoefer (2011) used an instrument variable approach and calculated the obesity related medical costs to be much more, at \$209.7 billion dollars in 2008. The medical costs were mainly associated with type 2 diabetes, coronary heart disease, and hypertension. Furthermore, half of these costs were financed by taxpayer funds through Medicare and Medicaid as opposed to private insurance. (Finkelstein, Trogon, Cohen & Dietz, 2009). These findings clearly demonstrate that obesity is affecting our national economy.

In addition, the estimated medical spending for the obese adult is \$1,429 or 42% higher per year than for a normal weight person (Finkelstein et al., 2009). According to Tsai et al. (2011), the incremental cost for the obese compared to a normal weight person was \$1,662 dollars or 42.7% more. By insurance carrier, the cost of obesity for Medicare is \$1,723 higher than for a normal weight beneficiary, \$1,021 higher for Medicaid, and \$1,140 higher for private insurance (Finkelstein et al., 2009). Medicare and Medicaid are 8.5% and 12%, respectively, more costly as a result of obesity related expenses (Yang & Nichols, 2011). All these figures give many social reasons to reduce and prevent the incidence of obesity in the U.S. as obesity contributes significantly to our national debt. This literally signifies billions of dollars, which are largely from taxpayers and from private corporate health insurance funds.

C. Purpose of Practice Change

Given the ever-increasing prevalence of obesity, PCPs have a great responsibility to address the escalating obesity epidemic in the United States. There are many opportunities for PCPs to take on a greater role through each individual patient they encounter, within their own communities or in the public policy arena (Brzezinski, 2008; Hayman et al., 2007; Roberts, 2010). PCPs need to develop an effective system to identify obesity early, screen for obesity-related co-morbidities, and promote effective interventions.

The purpose of this study was to improve PCPs' identification and management of obesity at a large FQHC in the Northeast through an obesity quality improvement (QI) project. To improve quality of care, process of care measures have been shown to be a more accurate indicators of PCPs' performance than outcome of care measures alone (Bell & Levinson, 2007). For this study, a multifaceted intervention was used that included: an interactive educational

workshop, educational outreach visits, and performance measurement and feedback of patient care data.

FQHCs mainly serve people below the poverty level, the uninsured, and the underinsured. These groups include a significant number of racial and ethnic minorities. The FQHC population nationwide has been shown to have an even higher prevalence of obesity than the national average. For example, of the population served by FQHCs, many patients are under Medicaid, a federal-state program that finances healthcare for low-income populations. For adults receiving Medicaid, the NHANES data indicates there was a 42% prevalence of obesity, compared to a 32% national average (Government Accountability Office (GAO), 2009).

At a large FQHC organization in the Northeast, data from 2012 indicates that a significant proportion of the adult population was overweight or obese, however, only 31% of the PCPs had some threshold of documentation on weight category and counseling on nutrition and physical activity, out of the 38,982 charts audited (Health Information Technology Applications Director, personal communication, May 10, 2012).

D. Theoretical Framework

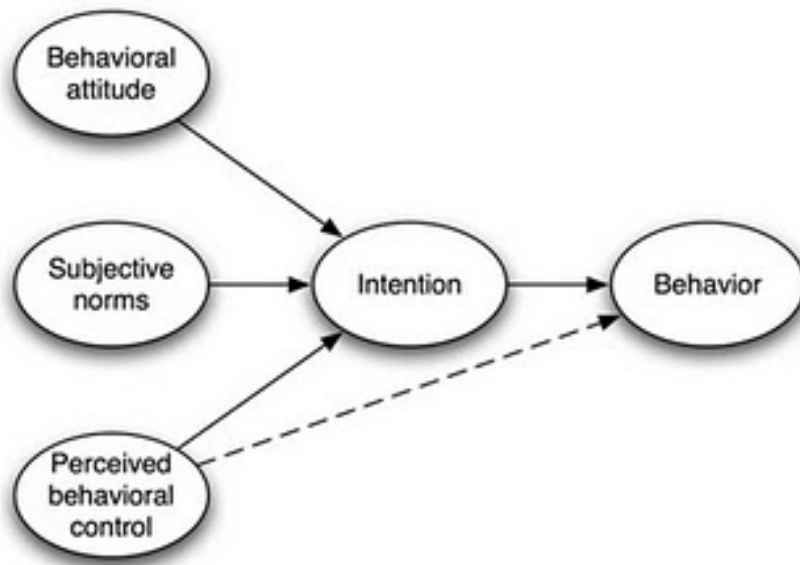
PCPs play a crucial role in health promotion, screening for obesity co-morbidities, and weight loss education. However, PCPs often do not have the time and resources to apply obesity guidelines (Rutledge et al., 2011). Therefore, PCPs' behavior is of central importance for this research study, and the *Theory of Planned Behavior* by Ajzen (1991) served as the guiding theoretical framework. The *Theory of Planned Behavior* (TPB) was “designed to predict and explain human behavior in specific contexts” (Ajzen, 1991, p.3).

This theory takes into consideration three different elements that predict intention and behavior (Ajzen, 1991) (see Figure 2):

- **Attitude** toward the behavior is determined by the person's interest in the behavior.
- **Subjective norms** refer to the person's social pressure to perform the behavior.
- **Perceived behavioral control** takes into consideration the person's perceived ease or difficulty to perform the behavior.

Ajzen (1991) states that typically, an individual's attitude, subjective norms, and perceived behavioral control influence their intentions, which determine if s/he will carry out the recommended behavior. By altering these 'predictors,' we can increase the likelihood of a person intending to comply with a desired behavior, which, in turn, increases the chance of the person actually doing so.

Figure 2. *Theory of Planned Behavior Model* (see Footnote ^a)



^a **Footnote:** From "The Theory of Planned Behavior" by I. Ajzen, 1991. *Journal of Experimental Social Psychology*, 50, p.04. Copyright 1991 by Academic Press, Inc. No permission needed for reprint. The figure is public domain. Personal communication with Dr. Ajzen.

The TPB relates well to PCPs' behaviors in terms of treatment decisions. Evidence based practice guidelines make recommendations to PCPs about treatment decisions to improve quality of care. However, these treatment guidelines are likely to be channeled through PCPs' attitudes, subjective norms, and perceived behavioral control. By making these predictors more appealing, there is an increased chance of PCPs following the guidelines more closely (Francis, Eccles, Johnston, Walker et al, 2004). The TPB can help medical educators execute strategies to encourage PCPs to follow guidelines more closely (Francis et al, 2004). For the purpose of this study, the TPB was used as a framework to examine PCPs' attitudes and behaviors as they relate to obesity guidelines.

E. Study Questions

The study addressed the following questions:

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in a FQHC organization?
2. What are current PCPs' attitudes and barriers regarding identification and management of overweight and obese patients?
3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?
4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

F. Definitions of Key Terms/Variables

Conceptual Definitions:

- **Attitude** is defined as favorability toward or against a fact or state (Ajzen & Fishbein, 2000).

- **Behavioral determinant** is defined as the person's measured response to a given outcome expectation (Ajzen, 1991).
- **Performance measurement and feedback** is a strategy of providing clinicians with reports of their patient care data (processes and/or outcomes of care) along with peer and benchmark comparisons (Van Hoof, Pearson, Giannotti et al., 2006).

Operational Definitions:

- **Attitude** is measured by the HCPs' score on the obesity attitude questionnaire (Salinas et al., 2011).
- **Behavioral determinants** are measured by obesity diagnosis and management (NHLBI panel, 1998): The inclusion criteria was adults 18 years or over with a BMI at or above 25 kg/m².
 - Identification of overweight or obesity: Determined by PCPs who included a diagnosis of overweight, obese or morbidly obese in their documentation.
 - Management of overweight or obesity: Determined by PCPs who documented a plan which includes patient education on nutrition and increased physical activity, and/or PCPs' documentation of a referral to a nutritionist, a diabetic educator or referral for bariatric surgery if BMI above 40 kg/m².
- **Performance measurement and feedback** was measured by the Uniform Data Set, 2012 criteria:
 - a. Documentation of weight
 - b. Counsel on nutrition and physical activity
 - c. Documentation of a follow up weight management plan.

Summary

Overweight and obesity are a significant epidemic nationally and responsible for many co-morbidities that diminish quality of life and possibly lead to death. In 2008, the medical costs related to obesity were estimated to be \$147 billion, half of which were financed by Medicare and Medicaid rather than by private insurance (Finkelstein et al., 2009). PCPs are responsible for most of the overweight and obesity management, but they frequently lack time and resources to address this vast problem. People of lower socioeconomic status are frequently at higher risk of obesity. At a large FQHC organization in the Northeast, data demonstrate that PCPs have opportunities for improvement in the identification and management of overweight and obesity in patients. The purpose of this research study was to conduct an obesity quality improvement (QI) project with PCPs. The multifaceted intervention reflected the *Theory of Planned Behavior* as a theoretical framework to help assess PCPs' barriers and change PCPs' behavior. Finally, the goal of the research study was to help PCPs improve their identification and management of overweight and obesity and documentation thereof.

Chapter Two

Literature Review

Introduction

Overweight and obesity continue to be an ever-increasing epidemic in the United States. Overweight and obesity rates combined are approaching 68.8%, of which nearly half of those are obese (Flegal et al., 2012). Obesity is a risk factor for many health conditions, including type 2 diabetes, hypertension, high cholesterol, coronary artery disease, stroke, certain cancers, and arthritis (Benjamin, 2010; Schelbert, 2009). Due to the tremendous prevalence of obesity and the complexity of co-morbidities associated with it, obesity is considered one of the biggest healthcare challenges that PCPs are currently responsible for managing (Smith et al., 2011).

The literature consistently suggests that PCPs have a strong influence on patients' behaviors (Smith et al., 2011). Research also indicates that PCPs' advice is a motivation for patients to increase physical activity and to lose weight (Smith et al., 2011; Post et al., 2011). In Post et al. (2011), the researchers studied the influence of PCPs' acknowledgement of patients' weight status on patients' perception of their weight and their motivation to lose weight. The findings indicate that patients being told they were overweight or obese by their PCP is associated with a more realistic perception of their weight and a desire to lose or attempt weight loss (Post et al., 2011).

PCPs are responsible for most of the weight management interventions in the clinical setting. However, they frequently lack time and resources to apply obesity treatment guidelines (Rutledge, Groesz, Linke, Woods, & Herbst, 2011). The literature supports that behavior strategies for providers and increased knowledge of obesity guidelines can enhance PCPs'

weight management effectiveness (Simkin-Silverman, 2008; Bloomgarden, 2007; Yarnall, Pollak, Ostbye, Krause, & Michener, 2003).

The *Theory of Planned Behavior* (TPB) has been shown to be an effective framework to help understand and modify PCPs' behavior in order to improve evidenced based practice (Kortteisto, Kaila, Komulainen, Mäntyranta, & Rissanen, 2010; Perkins et al., 2007). The purpose of this literature review was to examine PCPs' attitudes and behaviors as they relate to obesity guidelines through the framework of the TPB. Additionally, the literature was reviewed on quality improvement strategies to improve PCPs' identification and documentation of obesity and weight management.

Methods

Two literature searches were done. PubMed, CINAHL and Scopus databases were searched and the published literature within the last 5 years was identified (2008 to 2013), limited to the adult population. Search strategies varied by database. PubMed was searched for keywords or Medical Subject Heading (Mesh) terms. These Mesh terms included: obesity, body mass index, overweight, primary health nursing, physician's practice patterns and attitude of health personnel, obesity identification, treatment outcomes, and quality of health care. Results were limited to research studies in English. CINAHL was searched for keywords or major headings including obesity, overweight, health care personnel attitudes, performance, physician practice patterns, and primary care. Results were limited to research studies in English performed on adults and published within the last five years. In both PubMed and CINAHL the keywords were searched using "and" or "or" as viewed more applicable. Finally, through the Scopus database, the descendancy approach was used starting with older articles and searching for more recent related articles.

Inclusion Criteria

The sources reviewed were research articles in English published within the last five years. The studies were peer reviewed and were relevant to obesity and clinical practice for the adult population. The articles included were associated with obesity, overweight, primary care, application of practice guidelines, attitude of health personnel including nurses and physicians, assessment tools, and prevention measures. Only research studies were selected.

Results

In PubMed, the database search resulted in 144 articles that were identified, of which eight were selected. In CINAHL, the search resulted in 62 articles, of which 15 were selected. These articles were selected after reviewing the abstracts and finding the most applicable articles to the study. From there, three more related articles were identified by using Scopus for recent articles and by going through references and reviewing cited articles.

Theoretical Literature

Ajzen first developed the *Theory of Planned Behavior* (TPB) in 1985. Since then, many studies have demonstrated its effectiveness as a conceptual framework for behavior. The theory has also been shown to be one of the most popular social psychology models for predicting human behavior (Ajzen, 2011b). The guiding conceptual framework for the TPB describes that human behavior is influenced by three major factors: attitude toward the behavior (which is a favorable or an unfavorable idea of the behavior); subjective norms (believed social pressure to perform or not to perform the behavior); and perceived behavioral control (one's notion of capability to perform the behavior). These three lead to intention, which predicts behavioral outcomes (Ajzen, 2011b).

The TPB served as a guiding model for this study on PCPs' behavior as it relates to obesity management. The TPB has been shown to be a useful framework for understanding, predicting and changing PCPs' behavior (Ajzen, 2012; Kortteisto, 2010). The theory emphasizes that intention is the necessary precursor to behavior (Ajzen, 2012). One has to be resolved in order to want to act in a certain way through intentions, which determine behavior. Empirical support from multiple co-relational studies has shown that the TPB can be very useful to predict intention and behavior (Ajzen and Fishbein, 1972; Ajzen, Brown & Carvajal, 2004; Ajzen, Czasch & Flood, 2009; Ajzen, Fraser, Johnson, Hebert, et al., 2011; Ajzen, Joyce, Sheikh, & Gilbert Cote, 2011).

The literature applying the theory has shown that intention can be predicted with significant accuracy with measures of attitudes toward the behavior, subjective norms, and perceived behavioral control (Ajzen & Fishbein, 1972; Ajzen, Brown & Carvajal, 2004; Ajzen, Fraser, Johnson, Hebert, et al., 2011).

Explanation of the three concepts:

Behavioral beliefs and attitudes: The attitude about a behavior is influenced by one's beliefs of the behavior's consequences, positive or negative. By understanding people's favorable or unfavorable attitudes toward a behavior, we can better understand their behavioral beliefs (Ajzen, 2011a). In an empirical study in 2009 at the University of Massachusetts, a study of 160 undergraduate students was conducted using the TPB. The aim was to understand the students' commitment and conscientious will to watch a television show at a future date and provide feedback. The investigators wanted to see how serious students really were about being involved by assessing their attitude and intention to determine if the students were resolved enough to participate. In the study, researchers employed a questionnaire to assess students'

implementation intention to participate in a program. The results showed formation of implementation intention greatly increased performance of the behavior, from 37.1% in the control group to 60.0% in the implementation intention group, $F(2,96) = 3.67, p < .05$. In addition, a commitment to the intended behavior increased compliance from 42.0% without commitment to 61.5% with commitment, $F(1, 96) = 4.11, p < .05$. These findings were reliable that assessing people's attitude and intention to perform a behavior can help create a sense of commitment to the behavior which leads to increased compliance (Ajzen, Czasch & Flood, 2009).

Subjective norms: This refers to a person's belief that others will approve or disapprove of their behavior. The power of one's subjective norms is determined by the importance the individual places on complying with the perceived and factual expectations society places on them (Ajzen, 2011b). In two different empirical studies, subjective norms were measured and found to be influenced by family and friends' beliefs (Ajzen & Fishbein, 1972; Ajzen & Madden, 1986). In 1972, Ajzen and Fishbein gathered information about factors that influence behavioral intention. They sampled 70 students and presented them with four different high risk behaviors in order to analyze the probability that the students would carry them out. They looked at results before and after communication with family/friends. The findings showed students' belief in success was significantly influenced by their personal attitude toward high risk behavior and their family/friend's belief and expectations of them ($p < 0.01$) (Ajzen & Fishbein, 1972).

Perceived behavioral control: Defined as a person's estimation of the probability that they can carry out a behavior. Perceived behavioral control provides the TPB an introspective influencing factor that complements the subjective norm. Behavioral control is influenced by control factors that include skills and ability, money, time, and cooperation with other people

(Ajzen, 2011b). In Ajzen and Fishbein (1972), they found statistically significant results showing that one's own belief in success influenced attitude toward high risk behavior.

The *Theory of Planned Behavior* has been applied to health care professionals numerous times. The theory has mainly been used to predict intentions and determine behavior. To give a few examples: the theory has been applied to improve professional behavior in medical students; to assess PCPs' attitudes toward referring patients with eating disorders to nutritionists; to identify nurses and PCPs' beliefs about immunizations and alternative medicine; and to identify nurses' attitudes to use clinical guidelines for smoking cessation. All these studies showed the theory to be effective in predicting intention and evaluating behavior (Pielak et al., 2010).

Another cross-sectional study in 2009 distributed an Internet based survey within a large healthcare organization in Finland that included physicians, nurses, and other professionals (n=2252). In the study, 806 people participated and they used a TPB questionnaire to report their intentions to use clinical practice guidelines. The results showed that all the theory concepts, i.e., attitude, subjective norm, and perceived behavioral control, were important to assess intention in using clinical practice guidelines. In addition, both nurses and physicians had more positive intention ($p < 0.01$) compared to other professionals. Furthermore, the strongest concept for physicians was perceived behavioral control, while for nurses it was subjective norms. In other words, physicians needed to feel they were adequately equipped to carry out clinical guidelines as opposed to nurses who needed social support and pressure. These findings suggest that the *Theory of Planned Behavior* is an effective theory for implementing clinical practice guidelines in a healthcare organization (Kortteisto et al., 2010).

In conclusion, Ajzen's *Theory of Planned Behavior* is useful to develop a deeper understanding of peoples' attitudes and intentions, and to understand the root of their behaviors.

The TPB is an effective model to predict intentions and to improve behavior. Ajzens' theory has been shown to be appropriate for use in clinical practice. A greater understanding of PCPs' intentions and behaviors was gathered by use of the TPB as the theoretical framework.

Empirical Review

Overweight and obesity are in epidemic proportions in the United States (Flegal et al., 2010). PCPs hold much of the responsibility for weight management interventions in the clinical settings, yet obesity treatment guidelines are infrequently applied in practice. A review of the literature was conducted to explore the variables of interest for the proposed study, which include attitude toward guidelines, performance feedback, and PCPs' identification and documentation of obesity and weight management plan.

Dependent Variables

Attitude scale toward obesity guidelines

A review of the literature has several themes with multiple variables addressing PCPs' attitudes in managing obesity. PCPs generally have a negative attitude and little confidence in their ability to manage obese patients; they believe an obese patient to be responsible for most of their weight related complaints and that those obese patients will have worse health and worse adherence to treatment (Foster et al., 2003; Persky & Eccleston, 2011). PCPs consider themselves to have little success in their obesity treatment and they typically have low self-efficacy in managing obese patients (Ferrante, Piasecki, Ohman-Strickland, & Crabtree, 2009; Salinas, Glauser, Williamson, Rao, & Abdolrasulnia, 2011). Many studies have evaluated the PCPs' barriers to obesity management such as: lack of training, lack of time for weight loss counseling, poor patient outcomes, and limited resources (Alexander et al., 2007; Ferrante et al., 2009; Forman-Hoffman, Little, & Wahls, 2006). In addition, other studies report PCPs' barriers

including lack of reimbursement, and patients' lack of motivation and discipline to lose weight (Ferrante et al., 2009; Foster et al., 2003; Salinas et al., 2011). The literature also demonstrates that higher reported knowledge among PCPs correlates with improved attitudes about obesity management (Ferrante et al., 2009; Forman-Hoffman et al., 2006).

A cross-sectional survey conducted in 2011 included 300 PCPs as subjects to assess their attitudes, evaluation, and management of adult obese patients (Salinas et al., 2011). Seventy percent of physicians expressed little confidence in their ability to manage obesity. They were more likely to recommend lifestyle modifications than bariatric surgery or medications. Physicians reported a lack of confidence and they believed a big barrier to successful treatment was patients' lack of motivation to lose weight. Physicians with greater knowledge of obesity and more resources (i.e. nutritionists or nurses) were also more apt to address weight management of patients (Salinas et al., 2011).

While PCPs' knowledge of obesity is critical to control for, so is PCPs' attitude toward obese patients. A cross sectional study of 255 physicians assessed their attitudes about extremely obese adults with a BMI of 40 kg/m² or greater (Ferrante et al., 2009). The measures incorporated "obesity knowledge, weight management approaches, attitudes toward managing obesity, challenges with examinations, availability of supplies, and strategies to improve care" (Ferrante et al., 2009). Overall, there was a high prevalence of negative attitudes toward managing the extremely obese. The results show, for example, that 66% of PCPs thought managing obesity and weight loss was frustrating, and that 51% felt treatment for obesity was often ineffective. In addition, their data showed bariatric surgery and weight loss medications were not often recommended, particularly with PCPs' that had a high volume of extremely obese patients (for surgery odds ratio (OR) 0.38; 95% confidence interval (CI) 0.23, 0.62 and for

medications OR 0.51; 95% CI 0.31, 0.85) (Ferrante et al., 2009). Furthermore, PCPs described experiencing great challenges in performing physical exams on extremely obese patients (Ferrante et al., 2009). Finally, their results indicated that physicians who had more knowledge of weight loss diets had a more positive attitude about addressing obesity with patients (Ferrante et al., 2009).

The literature strongly supports the stance that attitudes of PCPs toward obese patients and PCPs' confidence to manage obese patients are correlated with effectiveness in obesity treatment. It is important to understand this concept as it relates to obesity identification and management. Negative attitudes of PCPs' toward obese patients prevent optimal obesity management. Helping PCPs overcome their negative attitudes toward obese patients can improve the likelihood of PCPs applying obesity treatment guidelines.

Performance measurement and feedback of patient care data

Applying evidence based practice guidelines into daily practice has been shown to be a significant challenge for PCPs, not just in treating obesity, but also in treating many acute and chronic diseases. Data show that PCPs frequently do not offer appropriate care to patients (Davies, 2011). Many different solutions have been offered to improve PCPs' adherence to clinical practice guidelines, including timely, non-punitive, individualized feedback (Hysong, 2006), guideline summaries, electronic medical record data audits (Ornstein, Nemeth, Jenkins & Nietert, 2010), leadership and system support, pay for performance, staff education and training, readily accessible evidenced based information (Mehrotra et al., 2007), and restructuring medical care to team-based care instead of individual PCP care (O'Toole, Cabral, Blumen, & Blake, 2011).

Multiple methods have been used to improve PCPs' adherence to guidelines. The studies to follow demonstrate a few examples and effective models of multifaceted interventions that helped improve PCPs' adherence to guidelines in primary care.

A randomized trial was implemented to improve colorectal cancer (CRC) screening in primary care (Ornstein et al., 2010). The study included 32 primary care practices caring for 68,150 patients over 50 years of age. The objective was to determine the impact of combining performance measurement and feedback of electronic medical record (EMR) data with educational outreach visits to the practices to improve adherence to colorectal cancer (CRC) screening guidelines. Patients in intervention practices exhibited significantly greater improvement (from 60.7% to 71.2%) with CRC screening than patients in control practices (from 57.7% to 62.8%). Authors concluded that a multifaceted QI intervention, which included electronic medical record (EMR)-based audit and feedback, practice site visits for academic detailing, and "best-practice" dissemination can improve CRC screening in primary care (Ornstein et al., 2010). This article was selected as a good model for the obesity project at hand, due to the multifaceted interventions that included electronic data extraction, PCPs' performance measurement and feedback, and educational outreach visits. These are all components that can be applied to obesity management to help PCPs adhere to obesity guidelines.

In 2009, a 12-week quality improvement project was done which aimed to improve PCPs' adherence to chronic kidney disease (CKD) clinical practice guidelines (Thomas, 2011). The researcher's interventions involved two CKD educational interventions and patient-level feedback to each PCP. The participants involved in the study included 46 providers and 6,781 diabetes mellitus patients' visits from a large statewide FQHC organization that had 12 sites. Each week several PCPs' records were reviewed of patients with diabetes mellitus and CKD.

Thereafter, PCPs' performance feedback were generated and emailed weekly to each PCP with a brief "tips" sheet with CKD related recommendations (Thomas, 2011). The results showed a significant increase in CKD screening from 38% at baseline to 46% after the intervention ($\chi^2 (1) = 3.88, p = 0.049$). In addition, there was an increased use of angiotensin-converting enzyme inhibitor/angiotensin-receptor blocker from 63% at baseline to 67% after intervention ($\chi^2 (1) = 16.19, p = 0.000$). There was also an increase in the CKD education and ancillary services PCPs used, which was statistically, but not clinically significant (Thomas, 2011). The researcher concluded that PCPs' performance feedback is necessary but not sufficient to improve PCPs' adherence to clinical practice guidelines and to modify PCPs' behavior (Thomas, 2011). The strategy was considered for this study. However, the PI decided to use a more personalized approach, including personalized academic detailing, because she believes increased education and the use of ancillary services, such as dietitian's and certified diabetic educators, are very important to obesity management and the referenced study did not have clinically significant results in those areas.

A multifaceted randomized control trial intervention on cholesterol management was implemented in primary care (Bertoni, Bonds, Chen, Hogan, Crago, et al., 2009). In the study 62 practices were included, 29 practices were in the intervention group addressing the National Cholesterol Adult Treatment Panel (ATP III) guidelines and 32 in the control group. The intervention group received personal digital assistance with cholesterol clinical practice guidelines, a lecture, a performance feedback report and four visits for group educational interventions at their practice. The results examined medical records of 5,057 patients at baseline and 3,821 patients at follow up. Screening for lipids increased from 43.6% to 49.0% (ATP III practices) and from 40.1% to 50.8% (control practices) (net difference, -5.3% [$p = .22$]). The net

change in appropriate management favored the intervention group (+9.7%; 95% confidence interval [CI], 2.8%-16.6% [$p < .01$]). Over treatment declined from 6.6% to 3.9% in intervention group and rose from 4.2% to 6.4% in control practices (net change, -4.9% [$p = .01$]). In conclusion, performance feedback, and educational interventions can help PCPs improve adherence to ATP III guidelines (Bertoni et al., 2009).

These studies demonstrate that the use of a multifaceted intervention including electronic data extraction for chart audits, PCPs' performance measurement and feedback, and educational outreach visits can be an effective way to increase PCPs' adherence to clinical practice guidelines. Different methods of data extractions may be used through the use of EMR data extraction tools or manual data extraction to offer PCPs reports on their current practice behaviors. All of these interventions can be effectively applied to help PCPs improve adherence to obesity guidelines in primary care.

PCPs' identification and documentation of obesity and weight management plans

PCPs play an essential role in obesity identification and treatment. Different interventions have been used to address PCPs' identification and documentation. A cross-sectional study was conducted in 2013 to examine PCPs' identification of overweight and obesity in Australia (Yoong et al., 2013). The study involved adult patients ($n=1111$) and PCPs ($n=51$). They calculated the PCPs' detection using patient self-reported weight and height as the criterion measure for overweight and obesity. The results showed the sensitivity for PCPs' assessment was 63 % [95 % CI 57-69 %], and specificity 89 % [95 % CI 85-92 %]. They concluded that PCPs missed identifying a considerable proportion of overweight and obese patients and that improved strategies to encourage PCPs' identification of obese patients are needed (Yoong et al., 2013).

A study conducted by Shaikh, Nelson, Tancredi & Byrd (2010) incorporated automatic BMI calculations in the electronic health record to increase identification of weight and weight loss plan during well child visits for children and adolescents. A pre-test post-test retrospective review of well child visits (n=550) for documentation of weight status and counseling on nutrition and physical activity was measured. Results showed no increase in documentation of identification of weight status or documentation of counseling on nutrition and physical activity. However, the PCPs who documented weight status had increased rates of documentation of counseling and weight loss plans. In conclusion, incorporating this passive EHR tool, which calculated BMI, did not increase documentation. Interventions to improve PCPs' documentation are needed (Shaikh et al., 2010). After considering this study, the PI was more strongly directed to incorporate a multifaceted intervention strategy, as there is greater probability of improved outcomes than with the use of a single intervention.

A retrospective cross-sectional study was conducted to determine physicians' practice patterns of obesity diagnosis and management (Bleich, Pickett-Blakely, & Cooper, 2011). The authors extracted clinical encounter data from the 2005 National Ambulatory Medical Care Survey (n= 2458). The results showed only 28.9% of obese adults received an obesity diagnosis with obesity interventions including: 17.6% received counseling for weight reduction, 25.2% for diet, and 20.5% for exercise. In this study, having an obesity diagnosis was the largest predictor of weight-related counseling (weight reduction: OR = 5.72; 95% CI: 4.01, 8.17; diet: OR = 2.89; 95% CI: 2.05, 4.06; exercise: OR = 2.54; 95% CI: 1.67, 3.85). "Other predictors of weight-related counseling included seeing a cardiologist/other internal medicine specialist, a preventive visit, or spending more time with the doctor ($p < 0.05$)" (Bleich et al., 2011).

In summary, PCPs do not frequently document identification and management plans for obese patients. PCPs have much room for improvement with documentation of obesity and their adherence to obesity guidelines. Multifaceted interventions directed for PCPs through programmed EMR reminders of obese patients, audits, and/or an educational intervention are needed to effectively improve PCPs' management of obese patients.

Independent Variables

Educational Intervention for PCPs

In a randomized control study by Schuster, Tasosa, & Terwoord (2008), the investigators implemented an obesity awareness program for PCPs to improve their management of obesity. In the study, 21 PCPs received obesity educational training and were shown their obesity related patient outcomes including: patient's weight, height, BMI, blood pressure, cholesterol, and hemoglobin A1c (diabetic marker) at baseline and at a 12-month follow-up. In addition, the intervention group of 10 PCPs received enhanced intervention obesity training. The results showed 53% of PCPs were not comfortable discussing obesity at baseline. After the educational intervention, the group receiving only baseline and follow-up data improved documentation from 2.4% to 9.2%, but the group receiving the enhanced intervention improved from 3.9% to 15.6%. Those patients in the enhanced intervention group lost an average of 6.19 lbs. (3.3%) ($p = 0.083$) over the course of one year compared to 4.6 lbs. (2.5%) ($p = 0.20$) in the intervention group (Schuster et al., 2008). The study concluded that PCPs are not comfortable diagnosing and managing obesity but that a combination of PCP education and outcome analysis can improve management (Schuster et al., 2008).

Another physician obesity training study used a non-randomized, wait-list/control design to assess the impact of an obesity-counseling curriculum on medical residents (Jay et al., 2010).

In the study, the participants were 23 primary care internal medicine residents, of which 12 were in the curriculum group and 11 were in the non-curriculum control group. The curriculum was a five-hour, multi-modal obesity counseling curriculum that used didactics, role-playing and standardized patients. The curriculum was based on a behavioral health framework that addressed the 5 A's (Assess, Advise, Agree, Assist, and Arrange) (Jay et al., 2010). The investigators spent seven months interviewing 163 of the residents' obese patients after the patients had their medical visits. The *t*-test was used to determine the difference between the quality and rate of counseling between the two groups of residents. They then compared the physicians, visits, and quality characteristics. The logistic and linear regression was used to examine the effectiveness of the curriculum. The results showed both groups offered obesity counseling (over 70%), but the quality of both groups was low (mean 36.6% vs. 31.2% for the different counseling strategies, $p = 0.21$). However, after controlling for the impact of the intervention, the curriculum group appeared to provide significantly higher quality counseling (std beta = 0.18; R (2) change = 2.9%, $p < 0.05$) (Jay et al., 2010).

These studies illustrate that lack of knowledge is one of the barriers to obesity management. Furthermore, offering an education intervention for PCPs was shown to be an effective intervention to improve documentation and management of obesity.

PCP Outcome Measures Improvement

PCPs' outcome measures have been shown to be important to determine behavioral changes needed and to bring about improvement in adherence to clinical practice guidelines. Various studies demonstrate the significance of measuring clinical outcomes to examine PCPs' performance. For example in 2011, Rocco et al. conducted a retrospective study to compare the effectiveness of a Plan-of-Care tool to facilitate physician-patient discussion to set health goals.

The researchers compared clinical outcomes at baseline and at the six-month follow up to address hemoglobin A1c (HbA1c), low-density lipoprotein (LDL), diastolic blood pressure (DP), systolic blood pressure (SP), and weight at baseline. Of 1,366 patients, 1,110 (593 intervention, 517 control) had baseline and follow-up clinical measures for analysis. Once controlling for demographic variables, there were significant effects in the intervention group: HbA1c ($p = .0067$), LDL ($p = .012$), and DP ($p = .091$). These results indicate that the Plan-of-Care improves clinical outcomes (Rocco et al., 2011).

Over the course of 24 months, O'Toole et al. (2011) conducted a longitudinal cohort study drawing a parallel between PCPs' performance feedback strategies and quality outcomes. The research studied 30 PCPs within Providence Veterans Administration (VA) Medical Center in seven family medicine sites. There were three phases for the study in which they compared PCPs' clinical outcomes of low-density lipoprotein target (<100 mg/dL). The phases were: Phase 1 (provider-specific data only), Phase 2 (team-based and individual PCP data and ranking), and Phase 3 (team-based data linked to quality improvement plans and individual provider data and ranking). The results showed that clinical performance feedback along with the quality improvement project was the most effective method of improved PCPs' outcome measures of LDL (O'Toole et al., 2011).

In addition, electronic health records (EHR) have been shown to be useful to extract data on PCPs' outcomes and documentation. The EHR can also be programmed to remind PCPs of clinical measures while documenting the patient visit, but various studies indicate that these reminders have not been effective in improving PCPs' compliance with evidenced based practice measures (Schnipper et al., 2010; Jones, Adams, Schneider, Ringel, & McGlynn, 2010; Romano & Stafford, 2011). As an example of a study showing poor outcomes with the use of EHR, in

Schnipper et al. (2010), the investigators evaluated the use of clinical decision support system (CDSS) to help enhance documentation and management of patients with coronary artery disease and diabetes. In 20 primary care clinics, they incorporated the use of a Smart Form (Schnipper et al., 2010). However, in the results the Smart Form was only used for 5.6% of the patients and the overall outcomes showed only modest improvement in managed care. Nonetheless, when used, the documentation showed potential for improved results, but more studies are needed (Schnipper et al., 2010). Another example of use of EHR showing positive outcomes was a quality improvement project published by Persell (2011) in which they used EHR to improve documentation and to offer performance feedback for 16 chronic disease and preventative care measures. Performance improved in nine measures after the intervention ($P < 0.001$ for eight measures, $P = 0.02$ for one). The results showed that using the EHR tools helped improve quality measures, performance, and documentation (Persell, 2011).

Summary

The *Theory of Planned Behavior* serves as an effective theoretical framework to understand people's attitudes, intentions, and behaviors. The theory has also been shown to be a reliable conceptual model for assessing PCPs' intentions and behaviors and can be useful to improve PCPs' obesity management behaviors. Furthermore, the empirical literature review demonstrates that PCPs have many barriers in their attitudes toward obese patients and their ability to manage obese patients effectively. A multifaceted QI intervention has been shown to be effective in improving PCPs' identification and documentation of obesity and weight management plans. Nevertheless, mixed reviews of the use of EHR for quality improvement show that more research is needed to demonstrate their successful use in practice. This study will determine if an attitude scale is helpful in identifying PCPs' barriers. Furthermore, interactive

educational workshops, educational outreach visits, and PCPs' performance measurement and feedback of patient care data, are effective interventions to improve documentation and identification of obesity and weight management plan.

Chapter Three

Methodology

Introduction

The high prevalence of overweight and obesity is a major epidemic in our nation. The National Health and Nutrition Examination Survey (NHANES) estimates that 33.0% of adults are overweight, 29.4% are obese, and 6.3% are extremely obese (Flegal, Carroll, Kit, & Ogden, 2012). Furthermore, in 2008, the direct medical cost for overweight and obesity combined was estimated to be \$113.9 billion dollars (Tsai, Williamson, & Glick, 2011). Obesity also has a strong correlation with cardiovascular disease, diabetes and malignancies, to name a few of the most prevalent co-morbidities (CDC Morbidity and Mortality Weekly Report (MMWR), 2009).

Obesity is a public health epidemic that should be treated as a medical disorder by PCPs in the clinical setting (Schuster, Tasosa, & Terwoord, 2008). The United States Preventative Task Force has recommended that PCPs screen for overweight and obesity and offer supportive counseling with behavioral based treatment, and when indicated, medications and bariatric surgery (U.S. Preventative Task Force, 2011). Despite the evidenced based research on obesity management, PCPs' screening and obesity management is low (Bardia, Holtan, Slezak, & Thompson, 2007). This gap is potentially due to negative attitudes of PCPs toward obese patients, lack of time and lack of reimbursement for PCPs, and their unfamiliarity with obesity guidelines and alternative treatments such as bariatric surgery (Ferrante, Piasecki, Ohman-Strickland, & Crabtree, 2009; Foster et al., 2003; G. D. Salinas, 2011; Spivack, Swietlik, Alessandrini, & Faith, 2010). The literature indicates that PCPs' clinical practice behavior can be changed through different interventions including performance measurement and feedback of

patient care data, educational interventions, and financial incentives (Hysong, 2006; Schuster et al., 2008).

In addition to the lack of PCP management of obese patients, adequate resources may not exist to manage obesity in certain patient populations. Compared with non-minority and higher income patients, minority and low income populations have even greater needs for obesity management as they frequently lack resources and have greater barriers to healthy living, such as lack of access to grocery stores with fresh produce and the inability to walk outside due to unsafe neighborhoods (National Association of Community Health Centers, 2009). FQHCs are responsible for the care of minorities, uninsured, and underinsured populations, yet PCPs in FQHCs sometimes have even more hurdles to overcome due to social and economic constraints, to encourage patient health and disease prevention (National Association of Community Health Centers, 2009). The hypothesis for this study was that by presenting PCPs with a multifaceted intervention strategy, PCPs would improve their knowledge of obesity management and subsequently improve their awareness and documentation of obesity, which, in turn, would lead to behavioral change.

Objectives: To assess PCPs' attitudes toward obesity management and to improve PCPs' documentation and management of overweight and obese patients. The first objective of this study was to understand FQHC PCPs' attitudes and barriers toward obesity care through the *Theory of Planned Behavior* as a theoretical framework and through an attitude and barrier questionnaire. The second objective was to improve early identification and management of obese and overweight patients through a multifaceted intervention strategy.

Problem: Within a large FQHC organization in the Northeast, data demonstrate that approximately of 77% of the adult population are overweight or obese (Health Information

Technology Applications Director, personal communication May 10, 2012). Nonetheless, PCPs' rates of documentation of identification and management of obesity remain low (Health Information Technology Applications Director, personal communication May 10, 2012).

Study Questions:

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in a FQHC organization?
2. What are current PCPs' attitudes and barriers regarding identification and management of overweight and obese patients?
3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?
4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

Methods

Setting

Participants were recruited from 13 sites within one FQHC organization in the Northeast of the United States.

Resources

The researcher involved in this study was the principal investigator (PI) who is a family nurse practitioner working toward her doctorate of nursing practice degree and employed within the FQHC organization. The PI was CITI certified. She implemented the study, collected the data, and carried out all the interventions.

While no funding was available for the study, the FQHC organization supported the study through time and effort of information technology (IT) staff, administrative assistance, PCPs' time, site meetings, and educational outreach.

Inclusion and Exclusion Criteria

Inclusion criteria for PCPs were those who treated adult patients, which included specialties in family medicine and internal medicine. The PCPs had to have been at the FQHC organization for more than two months and not have submitted their resignation. PCPs were the only study participants. However, the patients were indirectly part of the evaluation since PCPs' documentation of patient care data was evaluated. Inclusion criteria for patients were adult patients 18 or over with a body mass index (BMI) at or above 25 kg/m².

Sample

Target participants were PCPs, which included physicians, family nurse practitioners, and physician assistants working within the FQHC. Given the randomized control design, the recruitment goal was to have 40 PCPs participate out of the 62 total PCPs at the FQHC organization that met the inclusion criteria. This sample size was determined based on three factors. First, with the attitude questionnaire having a sample size of 40 PCPs, the standard error for estimated percentages would be approximately $\pm 7.5\%$. In addition, to detect a correlation between attitude and behavior, a sample of 40 PCPs would provide 80% power (in a 1-tailed test at the 5% level of significance) to detect a correlation that is 0.39 or larger in magnitude. Finally, to detect change in documentation between intervention versus control group, a sample of 40 PCPs would allow for detection of standardized differences in means of $d = 0.80$ or larger with 80% power.

A sample of convenience was used. From the subjects invited, 34 PCPs volunteered. After the initial phase of the multifaceted intervention had begun and while reviewing baseline obesity documentation data, it was brought to the attention of the PI that seven nurse practitioner residents had much higher documentation patterns and saw a much smaller sample of patients. This caused the PI to further investigate the rationale behind the difference in documentation pattern between the nurse practitioner residents and the other PCPs who treated adult patients. It was then discovered that the residents were given roughly 30 minutes per patient compared to the average time allotted to other PCPs of 12 minutes. The residents also saw a very small sample of patients. For these reasons, the residents were excluded from the study, as they were different in important ways than other PCPs in the sample. This decision left 27 participants. The residents were allowed to be involved in the multifaceted intervention but their data was not included.

Recruitment Methods

The PI first informed the onsite medical director (OSMD) of the research proposal so she was aware of the quality improvement study and could make potential suggestions for best workflow of the study within the organization. The PI sought IRB approval from the FQHC and the University of Connecticut. Recruitment of individual PCPs followed IRB approval.

The PI personally recruited all eligible PCPs and did not involve the OSMD or leadership in the recruitment process to avoid any perception of coercion. The PI introduced the study and solicited interest by emailing each eligible PCP. Based on expressed interest, the PI presented details of the study through either in-person visits (four locations) or through videoconferencing (five locations). During this discussion, the PI provided the written informed consent documents for review. The PI explained to the PCPs the risks, benefits, and alternatives of participating in

the study. Eligible PCPs, who remained willing and able to participate, signed the informed consent form.

Protection of Human Subjects

Institutional Review Board (IRB) approval for this study was obtained from the IRB at the FQHC organization in which the study was implemented (Appendix G) and from the University of Connecticut (Appendix D). Subjects were presented with the IRB approved protocol, and the risks and benefits of participating in the study were presented as part of the informed consent process (Polit & Beck, 2008). Potential risks of the study could have been perception of coercion by the participants as the PI was a co-worker. However, prior to the participants being given the contract they were reassured that their performance would remain anonymous and their job would not be affected. The benefits discussed were potential for improvement in participants' attitudes, knowledge, and management of obese patients. The patients' data collected were de-identified, where only the account number of the patients was provided. The participants remained anonymous and the organization was not identified to further protect participants' identity. The data of PCPs' identification and management of obesity were collected four times during four months. A scorecard was generated for each PCP extracting their documentation for the adult patients they saw within the past 1-2 months that had a BMI at or above 25 kg/m² (Table 1). The data collected were also safeguarded in a password-protected computer to ensure safety and privacy of human subjects. Finally, the study was monitored on an ongoing basis for risks and benefits, and if there had been a problem that affected the participants, the study would have been reevaluated or cancelled (See Appendix A for informed consent). No problems arose.

Procedures involved in Research

Convenience sampling was used to gather participants. While this method of sampling is less likely than probability sampling to generate accurate and representative samples (Polit & Beck, 2008), the sample gathered was demographically a strong representation of the FQHC's PCPs. Furthermore, the sample size gathered was the largest sample possible within the FQHC organization, taking into consideration that participation was voluntary and all eligible subjects were invited to participate. Finally, subjects were then randomized to control and intervention group to minimize internal threats to validity.

The study was six months in duration. After participants were recruited, the data were collected from both the control and the intervention group PCPs' documentation of patient care data. An EHR data extraction tool was used to extract PCPs' obesity documentation.

The quality improvement procedures for this study consisted of four phases:

- **Phase 1: Recruitment:** The first month was devoted to recruitment. Please see above in recruitment methods for an explanation.
- **Phase 2: Baseline Data:** This phase involved assessing PCPs' attitudes regarding obesity using an obesity attitude survey (Appendices B-D). A modified version of the *Physician Attitudes about Obesity* survey (G. D. Salinas, Glauser, Williamson, Rao, & Abdolrasulnia, 2011) was administered electronically through SurveyMonkey ® to PCP participants to assess attitudes and beliefs pertaining to obesity management and perceived barriers to obesity care. The survey link was emailed individually to both control and intervention PCPs to assess baseline obesity management attitudes prior to the multifaceted intervention. If the survey was not completed with the first email, two other successive emails were sent to remind PCPs to

complete the survey. In addition, the PI extracted the baseline patient care obesity data during this phase.

- **Phase 3: Multifaceted Intervention:** Only the PCPs in the intervention group received the following multifaceted intervention:

a. Interactive Educational workshop (see Appendix E for further details): There was an overweight/obesity evidence-based educational workshop provided by the PI. The workshop was offered during lunch Monday through Thursday (Oct. 7, 2013 – Oct.10, 2013) in-person at four different sites. All PCPs in the intervention group were expected to attend. PCPs in the intervention group were encouraged to attend in person if the educational workshop was offered at their site. However, the educational workshop was made available by videoconferencing to the PCPs who were unable to make it in-person or who were not working at one of the sites where it was offered in-person. In the case that a subject in the intervention group could not attend, the PI arranged to meet individually with the PCP.

The aim was to help PCPs identify overweight or obese patients at risk for developing or worsening comorbid conditions, communicate the health benefits of weight loss to overweight and obese patients, help PCPs set realistic weight loss goals with their patients, and make appropriate recommendations for weight loss options that would most benefit their patients. In addition, the PI also instructed PCPs on how to improve their obesity documentation.

The main themes discussed in the educational workshop were the *Transtheoretical Model of Behavior Change* and intensive lifestyle interventions for weight loss, which emphasize the need for regular follow up (Wadden, 2011). The PI also reviewed indications for various treatment modalities including pharmacotherapy and bariatric surgery (Ikramuddin et al., 2013).

Each interactive educational workshop lasted approximately 60 minutes. The content reflected evidenced based practice guidelines on obesity management. The workshop was presented with an interactive format. The presentation began with a case study to allow for discussion about obesity management and for participants to share their personal successes and challenges with obesity management. During the discussion about the case study, many participants shared their challenges. This created a sense of camaraderie as participants recognized that some level of challenge was shared across the group. The PI also presented four topics and asked the participants to discuss their practice patterns for each topic. For example, one topic was bariatric surgery. After the presentation, discussion was encouraged and PCPs shared their personal thoughts on bariatric surgery or shared their experiences with patients that had bariatric surgery and the things that went well or poorly. This was also a time for questions, in which the participants asked the PI to further expand on a question they had. For example, one participant, after presenting on bariatric surgery, asked what labs the PI recommended to be ordered on a patient that had had bariatric surgery if the patient was unable to follow-up with the surgeon. The presentation was presented with a PowerPoint, but was structured to be interactive to help participants think deeply about the content and how it applied to their practice.

b. Performance measurement and feedback of patient care data: To assess performance, the PI reviewed PCPs' documentation using an *Obesity Data Collection Tool* (Table 1). This performance scorecard is further described below under Instrument for Behavior Determinants.

With the identification and management data for each PCP, a scorecard was generated showing the percentage of times the PCP identified the patient by their weight category, and the percentage of times the PCP discussed an obesity management plan with the patient.

The PI emailed a monthly performance scorecard to each individual PCP with an analysis of their patient care documentation along with benchmark performance from her/his peers. The aim of sharing the benchmark was for PCPs to be aware of an obtainable goal within their same practice setting, as research demonstrates that benchmarks enhance the effectiveness of performance feedback (Van Hoof, Pearson, et al., 2006). The scorecards were emailed monthly for four consecutive months. The objective of the performance scorecard was for the PCPs to have more awareness of their documentation with the hope of improving their obesity management and documentation.

c. Educational Outreach Sessions: The PI sought to meet twice with each PCP in the intervention group for a one-on-one virtual educational outreach session during the four-month intervention phase. These sessions took place over the phone and lasted approximately 10 minutes each. Research shows educational outreach sessions have been shown to be an effective strategy in QI to improve PCPs' performance and chronic disease management (Meehan, Van Hoof, et al., 2009). In educational outreach, the change agent is able to assess practice needs, to interact with PCPs over time in a sequenced fashion, and to tailor interventions to meet barriers (Meehan, Van Hoof, et al., 2009).

During these educational outreach sessions, the PI discussed with the PCPs if they had made any changes in practice with managing obese patients since attending the interactive educational workshop and receiving their baseline obesity scorecard. The outreach visits also provided PCPs an opportunity to discuss their experiences with managing their obese patients and to reveal any barriers they faced in managing their patient population. The PI also used the educational outreach session as a time to offer PCPs feedback on their performance and to educate PCPs about ways in which they could improve or modify their documentation. In

addition, after every session with each PCP, the PI emailed individual PCPs evidenced based practice resources as needed, based on performance, attitude or knowledge barriers identified.

The PI arranged to meet with each PCP in the intervention group during their administrative time, their lunch break, or before or after their patient care schedule. The PI considered using “GoToMeeting” if needed to illustrate live to the PCPs proper documentation in the EHR. However, no live virtual demonstrations occurred.

• **Phase 4: Outcome assessment:** This included a final review of PCPs’ identification and documentation of obesity and documentation of weight management plan in both control and intervention groups to assess potential differences in documentation behaviors. The final data collection for both groups occurred on the fifth month. The Obesity Attitude Questionnaire was also sent out a second and final time to all PCP participants through SurveyMoney ®. After the final results were gathered and the study was completed, participants involved received an email with aggregate project results.

Instruments

a. Instrument for Provider Attitudes: The *Physician Attitudes about Obesity* survey (Salinas, Glauser, Williamson, Rao, & Abdolrasulnia, 2011) was selected for this research. The PI did an extensive literature review for obesity attitude surveys and found the selected one to be the most pertinent and comprehensive for the purpose of this study.

The survey was not validated in the original publication or for this study due to resource limitations. However, the survey was used and published in Salinas et al. (2011), showing it to be an effective tool grounded in evidence and theory to assess physicians’ attitudes about obesity. Dr. Salinas from Birmingham was the author and the person the PI contacted for permission to

modify and use the survey. For the purpose of this study, the survey language was modified to state “provider” instead of “physician” to include nurse practitioners and physician assistants.

The Salinas et al. (2011) survey was used to assess PCPs’ attitudes and practice patterns about managing obesity (see Appendices B through D). The survey offered the additional advantage of being completed in five minutes or less.

The survey collected demographic information from the PCPs (see Appendix B). The first instrument (see Appendix C) included eleven statements to measure PCPs’ attitudes about managing obesity. The results were assessed on a 5-point Likert scale (Disagree Strongly, Disagree Somewhat, Neutral, Agree Somewhat, and Agree Strongly). This instrument helped assess PCPs’ confidence in managing obesity and their belief in the effectiveness of gastric bypass and pharmacological management (Salinas et al, 2011). To present the data on the attitudes and confidence in managing obesity, each statement was summarized for all the PCPs, and then for the control and intervention groups separately.

The second instrument (see Appendix D) was used to assess PCPs’ barriers to managing obesity. The instrument included seven items for PCPs to rate their confidence in addressing different treatment options for obese patients on a 10-point scale (1: not at all significant; to 10: extremely significant) (Salinas et al., 2011). To analyze the results, each statement was presented with the calculated means and standard deviation (SD) for all the PCPs, and then for the control and intervention groups separately.

b. Instrument for Behavioral determinants: The data were extracted electronically from the EHR. The inclusion criteria were all adult patients seen by the PCP with a BMI at or above 25 kg/m² (The patients were weighed at each office visit and the BMI was automatically

generated in the EHR). If a PCP happened to see a patient more than once in a given month, the visit that reflected more accurate and complete documentation was used.

The *Obesity Data Collection Tool* included two categories, documentation of obesity identification (weight category diagnosis) and documentation of obesity management plan. The documentation of “identification” of overweight and obesity was extracted with the diagnostic International Classification of Disease (ICD9) code. The ICD9 codes included were overweight, obese or morbidly obese. For the documentation of “management” of overweight and obesity there were multiple parameters that were included. The PCP could document with one of three methods. They could document discussion of obesity in the “History of Present Illness” section under the “Obesity” heading of the progress note. Second, they could document making weight loss recommendations in the “Preventative Medicine” section of the progress note under the heading of “Nutrition” or “Exercise.” Third, PCPs could document having addressed weight loss with the patient by making an outside referral, including a referral to a registered dietitian, a certified diabetic educator, or a bariatric center. Any one of these methods of discussing overweight or obesity with the patient was accepted as having appropriately “managed” obesity.

The two categories of identification and management of overweight and obesity were also determined in the adult obesity guidelines (NHLBI panel, 2000; August et al., 2008):

1. Weight category diagnosis identified:

- For adults: overweight ($\text{BMI} \geq 25 \text{ kg/m}^2$), obese ($\text{BMI} \geq 30 \text{ kg/m}^2$) and morbidly obese ($\text{BMI} \geq 40 \text{ kg/m}^2$).

2. Documentation of Weight Management Plan:

- This can include the PCP discusses patient weight in progress note.
- The PCP counsels the patient on diet and exercise.

- The PCP refers the patient to a registered dietitian, or for bariatric surgery or to a certified diabetic educator.

The Uniform Data Set (UDS) of Human Resource and Services Administration (HRSA) determined the parameters that were used for the *Obesity Data Collection Tool*. However, these parameters were also recommended in the adult obesity guidelines (NHLBI panel, 2000) and the U.S. Preventative Task Force (2012) (Moyer, 2012). The PI used these parameters, as they are the performance expectations for the PCPs and also the data the FQHC organization uses to report annually to HRSA.

With the data a scorecard was generated for each PCP showing the total percentage of times that treatment was documented appropriately in the identification and the management category. The number of patients reviewed for each PCP varied depending on how many patients each PCP had seen in between data extraction intervals. However, since randomization was used to assign PCPs to the intervention and control groups, there was an expectation that variation in the number of patients seen by each PCP and reviewed for study purposes would be balanced between groups. The limitation of using the EHR to capture data for the scorecard is that it did not capture free-text documentation about care.

Table 7. *Obesity Data Collection Tool for Performance Reporting Feedback*
(see Footnote ^b)

Patient Study ID	Weight Category Diagnosis Identification	Weight Management Plan Documented
	ICD9 in Assessment	Document <u>One</u> of the Following:
	ICD9: - 278.02: Overweight - 278.00: Obesity - 278.01: Morbid Obese	1. HPI: Endocrine: Obesity 2. Preventative Medicine: - Exercise and/or Nutrition - Counseling: Diet and/or Exercise 3. Referral to: - CHC- Nutrition - Nutritionist - FoodSmart and Fit - CHC- CDE (Certified Diabetic Educator) - Bariatric Surgery
961276	Yes	Yes
	60% of the times documented	40% of the times documented

^b **Footnote:**

- Patient Study ID: The patients' identifying number
- Weight Category Diagnosis Identification: The PCP was assessed on appropriately identifying patient if they included the weight category of overweight, obese, or morbid obese based on the ICD9 code.
- Weight Management Plan Documented: The PCP was assessed on appropriately managing weight if they documented: (1) discussion of obesity in the history of present illness (HPI), (2) if they documented under Preventative Medicine: counseling on diet and or exercise, or (3) if they made a Referral for weight management services.

Analysis

The data were managed on the statistical software IBM ® Statistical Package for the Social Sciences (SPSS ®) Version 20.0 Grad Pack (IMB Corporation, 2011). Data included the demographic characteristics of the sample population, the pre and post survey results, and the baseline and monthly obesity documentation data. Descriptive analysis was used to compare the demographic data of the subjects. The independent sample t-test analysis was also used to compare the demographic data between the two study groups to examine the equivalence of the study group. Finally, the results were analyzed to answer each of the research questions.

Study Questions:

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in a FQHC organization?

The aim of this question was to systematically assess adherence to clinical guidelines for the identification and management of overweight and obesity. To assess guideline compliance the obesity performance scorecard was used, and it defined compliance as the presence of documentation of the identification and management of obesity. To address this question, the means and standard deviations for the percentages of PCPs' documentation were presented. First, the documentation of the entire sample was presented ($n = 27$), and then separately for the control and intervention groups. Afterward, the control and the intervention groups were compared using the two-tailed independent sample t-test. Finally, comparison statistics were conducted between the two groups to assess similarity of PCPs' documentation using the Levene's test and the two-tailed independent sample t-test.

2. What are current PCPs' attitudes and barriers regarding identification and management of overweight and obese patients?

The survey was used to assess attitudes and barriers to obesity management. The results from each statement in the attitudes and confidence in discussing obesity section were on a 5-point Likert scale, but they were dichotomized into two categories which were “agree” versus “something else,” as done in the Salinas et al. (2011) article. Then the data were presented reflecting the attitudes and confidence results for the entire sample, and also separately for the control and the intervention groups. To compare the group results from the attitudes and confidence in discussing obesity, the Chi-square test was used. To report the PCPs' barriers to obesity management, the results from each statement were presented with the mean and standard deviation for the entire sample and for the control and the intervention groups. These groups were also compared using the independent sample t-test.

3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?

To demonstrate if PCPs' attitudes correlated with their behavior, the Spearman Rank Correlation Coefficient was calculated between the baseline attitudes and confidence, and the baseline percentage of visits in which the PCPs documented obesity identification and management. To demonstrate if the PCPs' barriers correlated with their behavior, the Pearson Product Moment Correlation was calculated between the baseline barriers and the percentage of visits in which the PCPs documented identification and management. The Spearman Rank Correlation Coefficient and the Pearson Product Moment Correlation yielded a p-value that indicated whether or not there was evidence of a statistically significant correlation. Due to the

small sample size, statistical significance would be calculated at $p < 0.10$, $p < 0.05$, and $p < 0.01$, to determine if associations existed.

4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

To determine if the multifaceted intervention had an impact on PCPs' attitudes and confidence in discussing obesity treatment, the baseline and follow-up survey results were compared using the McNemar's test to determine if there was a change in the PCPs' attitudes after the multifaceted intervention. With regard to the barriers, since the data were presented with a mean, the paired sample t-test was used to determine if there was a change in barriers. In addition, the baseline and follow-up survey results were compared indicating the degree of change in percentage for the attitude and confidence section of the survey, and the degree of change in the mean score for the barriers section of the survey for the total sample, the control and intervention groups.

To assess how quickly documentation behavior changed in response to the multifaceted intervention, the monthly obesity scorecard was used and the data were presented in a graph showing the obesity identification and management separately. Afterward, the baseline and final data were presented separately and then compared for the identification and management of obesity using the paired t-test.

Summary

Feasible and promising programs for improving obesity in primary care are available. This study measured both PCPs' attitudes and behaviors before and after a multifaceted intervention. The study used a randomized controlled trial design. Data were collected on both PCPs' attitudes and PCPs' obesity behavioral determinants. Protection of human subjects was

taken into consideration by de-identifying patients and PCPs. The PI used the data to describe PCPs' attitudes about managing obesity and to determine if a correlation existed between PCPs' attitudes and PCPs' documentation patterns. Finally, this study sought to determine if a multifaceted intervention strategy improved PCPs' obesity documentation and management.

Chapter Four

Results

The purpose of this study was to evaluate PCPs' attitudes and barriers to obesity management and to implement a multifaceted intervention to improve PCPs' identification and management of overweight and obesity. A randomized control design was utilized for this study. The *Theory of Planned Behavior* by Ajzen (1991) served as the theoretical framework.

The study questions for this quality improvement study were:

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in a FQHC organization?
2. What are current PCPs' attitudes and barriers regarding identification and management of overweight and obese patients?
3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?
4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

Data analysis was conducted on the statistical software IBM ® Statistical Package for the Social Sciences (SPSS ®) Version 20.0 Grad Pack (IBM Corporation, 2011).

Description of the Sample

Subjects were recruited from a large FQHC in the Northeast. From a population of 62 PCPs that met the inclusion criteria, 34 PCPs accepted an invitation to participate in the study. Of the 34 PCPs that volunteered, 27 PCP participants were considered eligible. Participant PCPs served an adult population and reflected the specialties of family medicine and internal medicine. A sample of convenience was used for recruitment. Prior to the multifaceted intervention,

participants were randomized using a random number generator into one of two groups (control and intervention). However, after the randomization, the seven nurse practitioner residents were excluded from the study data analysis, creating an imbalance in the number of participants in the control and intervention groups (11 PCPs vs. 16 PCPs) (Table 8).

Participants that volunteered were from nine of 13 sites across the FQHC (Table 1). Demographic data for PCPs included training, years of experience, and specialty. Seventeen of the PCPs were physicians (MD or DO) and 10 were advanced practice registered nurses (APRNs) or physician assistants (PAs). Fourteen of the PCPs had less than five years of experience, four had 6-10 years of experience, four had 11-15 years of experience, and five had 15 or more years of experience. Twenty-one of the PCPs were family medicine PCPs and six were internal medicine specialists.

Baseline differences for the type of license held ($p = 0.38$) and years of practice ($p = 0.69$) were not statistically significant between the control and intervention groups (Table 1). The baseline difference for the patient population served ($p = 0.027$) was statistically significant when comparing the control versus intervention groups, as the PCPs in both group served different populations of either children and adults, or only adults. When comparing the groups, the majority of the PCPs in the intervention group (94%) served children and adults, but only 55% of the control group served children and adults (Table 8).

Table 8. *Demographic Background Information by Group*

Characteristic	Total (n=27)	Control (n=11)	Intervention (n=16)	P-Value ^a
Type of License Held				0.38
MD/DO	17	8 (73%)	9 (56%)	
APRN/PA	10	3 (27%)	7 (44%)	
Years in Practice				0.69
1 – 5	14	5 (46%)	9 (56%)	
6 - 10	4	1 (9%)	3 (19%)	
11 - 15	4	2 (18%)	2 (13%)	
16 or more	5	3 (27%)	2 (13%)	
Population Served				0.027
Children and adults	21	6 (55%)	15 (94%)	
Adults only	6	5 (46%)	1 (6%)	

^a Control versus Intervention

Multifaceted Intervention Participation

The 16 intervention group participants all attended the interactive educational workshop. Ten attended in-person, three attended through video-conferencing, and three attended over the phone. The interactive educational workshop was offered at four different times and each group had 3-6 participants. All the educational outreach sessions took place over the phone. The aim was to provide outreach to each PCP twice during the intervention period. All PCPs received the first visit, and 14 received the second. Due to scheduling conflicts, two PCPs were not available for the second outreach visit.

Analysis of Research Questions

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in an FQHC organization?

To assess guideline compliance, the obesity scorecard defined compliance as the presence of documentation for the identification and management of overweight and obesity. The

documentation was presented using the mean percentage and standard deviation (Table 9). The mean percentage was calculated for each PCP by weighing the times the PCPs documented appropriately the identification and management, out of the total of overweight/obese encounters each PCP saw for the month. The average mean percentage was then calculated for all PCPs and for the control and intervention groups separately. The baseline documentation demonstrated that for the total sample population ($n = 27$), PCPs identified 10% of patients and managed 8%. At baseline, the control group identified 9% of patients and managed 5%. At baseline, the intervention group identified 10% of patients and managed 10%. The two groups were compared using independent sample t-test. The results for the identification ($p = 0.785$) and management ($p = 0.127$) of obesity were not statistically significant (Table 9).

In addition, comparison statistics were conducted between the two groups to assess similarity of PCPs' documentation on obesity identification and obesity management between the control and intervention group. The Levene's test verified the equality of variance (homogeneity of variance) between the control and intervention groups with both the identification and the management of obesity ($p > 0.05$) (Martin & Bridgemon, 2012).

Table 9. Mean Percentage (SD) Performance Data at Baseline

Items	Total	Control	Intervention	P-Value ^a
Proportion of Identifications	10%	9%	10%	.785
SD	(.09)	(.04)	(.11)	
N	27	11	16	
Proportion of Management	8%	5%	10%	.127
SD	(.08)	(.04)	(.09)	
N	27	11	16	

^a Control versus Intervention

2. What are current PCPs' attitudes and barriers regarding identification and management of overweight and obese patients?

To assess PCPs' attitudes and barriers to obesity management, a survey was used entitled "PCP Attitudes and Practice Patterns in the Management of Obese Adults" (Salinas et al., 2011). The survey was administered to participants in the control ($n=11$) and intervention groups ($n=16$). In the report of the PCPs' attitudes and confidence in discussing obesity treatments, the results were dichotomized from the Likert scale into "agree" versus "something else" (Tables 10 and 11). Only the "agree" data were presented for the attitudes and confidence results, as that data was specific to describing the positive attitudes and the areas in which the PCPs had the highest confidence.

The report of PCPs' attitudes at baseline is presented in Table 10. PCPs' responses to each of the attitude statements are listed under four categories of total, control, intervention and comparison (p -value). PCPs' responses were very high for the statement "providers can help obese patients achieve a healthier weight." Of all PCPs, 89% agreed with the statement. In the control group, 100% agreed with statement; 80% of the intervention group agreed. There were also high results for the statement "lifestyle changes are effective in helping obese patients lose weight." Results demonstrate that 89% of all PCPs agreed, and 91% of the control group and 87% of the intervention PCPs agreed. The majority of PCPs considered bariatric surgery effective in helping patients lose weight, with 85% of the total group agreeing. Only 46% of PCPs considered it a safe option though. The Chi-square test was used to compare the group responses for each statement. The results ranged from 0.067-1.00, demonstrating no significant group differences at baseline.

Table 10. *Number (Valid Percentage) Agree with Attitude by Group at Baseline*

Items	Total	Control	Intervention	P-Value^a
Providers can help obese patients achieve a healthier weight	23/36 (89)	11/11 (100)	12/15 (80)	.238
Losing weight is primarily a patient's responsibility	16/25 (64)	6 /10 (60)	10/15 (67)	.734
Lifestyle changes are effective in helping obese patients lose weight	23/26 (89)	10/11 (91)	13/15 (87)	1.00
I feel confident in assisting patients with weight management	14/26 (54)	6/11 (55)	8/15 (53)	.951
Medications are effective in helping obese patient lose weight	9/26 (35)	6/11 (55)	3/15 (20)	.067
Medications for weight loss are safe	5/26 (19)	3/11 (27)	2/15 (13)	.620
Bariatric surgery is effective in helping obese patients lose weight	22/26 (85)	10/11 (91)	12/15 (80)	.614
Bariatric surgery for weight loss is safe	12/26 (46)	4/11 (36)	8/15 (53)	.391

^a Control versus Intervention

The report of PCPs' confidence in discussing obesity treatment options is presented in Table 11. The findings reveal PCPs are confident in discussing lifestyle modifications (96% of total) and bariatric surgery (81%); however, PCPs demonstrated less confidence in discussing medications for weight loss (54%) and commercial weight loss programs (35%). The Chi-square test was used to compare the group responses for each statement. The results ranged from .039-1.00 and demonstrated no significant differences between the two groups at baseline.

Table 11. *Number (Valid Percentage) Agree with Confidence in Discussing Treatments by Group at Baseline*

Items	Total	Control	Intervention	P-Value ^a
Lifestyle modifications	25/26 (96)	11/11 (100)	14/15 (93)	1.00
Medications	14/26 (54)	7/11 (64)	7/15 (47)	.391
Commercial weight loss programs	9/26 (35)	3/11 (27)	6/15 (40)	.500
Bariatric surgery	21/26 (81)	9/11 (82)	12/15 (80)	1.00

^a Control versus Intervention

Results of each statement of PCPs' barriers to obesity management are presented with their mean and standard deviation values (Table 12). The mean is gathered from a 1-10 point scale. The results demonstrate PCPs considered their greatest barrier to obesity management as "lack of time during encounter" (mean of 8.2 for all PCPs). They also considered "lack of motivation among patients" (mean = 7.0) and "lack of ancillary and community resources" (mean = 6.1) as significant barriers to obesity management. Comparing the groups using the independent sample t-test determined no significant differences in perceived barriers between the two groups at baseline.

Table 12. *Mean (SD) Barriers to Addressing Weight by Group at Baseline*

Items	Total	Control	Intervention	P-Value ^a
Lack of motivation among patients	7.0 (2.1)	7.0 (1.9)	7.0 (2.3)	1.00
Lack of time during encounters	8.2 (1.3)	8.1 (1.4)	8.3 (1.3)	.746
Lack of insurance reimbursement for weight management	5.6 (2.8)	5.3 (2.9)	5.9 (2.7)	.598
Sensitivity of patients to weight issues	4.8 (2.5)	4.4 (2.2)	5.1 (2.7)	.446

Lack of ancillary and community resources	6.1 (2.0)	5.3 (2.0)	6.7 (1.9)	.082
Lack of training in effective communication about obesity	4.7 (2.2)	4.1 (2.0)	5.2 (2.3)	.207
Lack of knowledge and skills in weight management	4.6 (2.1)	4.1 (1.9)	5.0 (2.2)	.289

^a Control versus Intervention

3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?

To determine if an association exists between PCPs' attitudes and barriers and PCPs' documentation the control and intervention groups were compared at baseline. The baseline survey results were compared to the baseline documentation adherence on obesity identification/management using the Spearman rank correlation coefficient (Tables 13, 14 and 15). The baseline survey includes three sections, which are PCPs' attitudes about managing obesity, PCPs' confidence in managing obesity, and PCPs' barriers to obesity management. Each of these three sections was compared to PCPs' documentation, which reflects identification and management of obesity. These two components of documentation were extracted from the baseline obesity scorecard.

The aim was to demonstrate that PCPs who had a positive attitude and fewer barriers to obesity management were more likely to have higher patterns of obesity documentation. The detailed analyses of PCPs' baseline attitudes were compared to PCPs' identification and management in Table 13, which shows the findings for each item. The majority of values show no significant association, except for three statements. The statement "providers can help obese

patients achieve a healthy weight” shows a statistically significant association to the documentation of obesity identification ($p < 0.01$). The statement “lifestyle changes are effective in helping obese patients lose weight” shows an association to the identification of overweight/obese patients ($p < 0.05$). The third statement “bariatric surgery for weight loss is safe,” also showed a trend toward an association with obesity/overweight identification ($p < 0.10$).

Table 13. *Spearman Rank Correlation between Baseline Attitude Statements and PCPs’ Documentation (n=27)*

Items	Identification	Management
Providers can help obese patients achieve a healthier weight	.547***	.039
Losing weight is primarily a patient’s responsibility	-.021	-.074
Lifestyle changes are effective in helping obese patients lose weight	.477**	.256
I feel confident in assisting patients with weight management	.314	.079
Medications are effective in helping obese patient lose weight	.037	-.089
Medications for weight loss are safe	.085	-.072
Bariatric surgery is effective in helping obese patients lose weight	-.016	-.301
Bariatric surgery for weight loss is safe	.334*	.084

*Statistical significance demonstrated: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The analysis of PCPs’ confidence in discussing obesity is compared to PCPs’ identification and management in Table 14 using the Spearman rank correlation coefficient. The questions related to PCPs’ confidence at baseline in addressing lifestyle modifications for weight

loss, medications for weight loss, commercial weight loss programs and bariatric surgery. The values from the confidence questions were compared to the PCPs' documentation on overweight/obesity identification and management. However, all values demonstrate no significant association ($p > 0.05$).

Table 14. *Spearman Rank Correlation between Baseline Confidence Statements and PCPs' Documentation (n=27)*

Items	Identification	Management
Lifestyle modifications	.200	.133
Medications	-.032	-.012
Commercial weight loss programs	-.067	.173
Bariatric surgery	.053	.164

No significant associations, all $p > 0.05$

The analysis of PCPs' barriers to obesity management is compared to PCPs' identification and management in Table 15. The majority of values show no significant association, except for three statements. Higher PCP rankings of "lack of motivation among patients" as a barrier to obesity management are associated with a lower frequency of documented obesity identification, $r = -0.495$ ($p < 0.01$). Higher PCP ranking of "lack of ancillary and community resources" as a barrier to obesity management are associated with a higher frequency of documented obesity management $r = 0.362$ ($p < 0.1$). Higher PCP ranking of "lack of training in effective communication about obesity" as a barrier to obesity management are associated with a lower frequency of documented obesity identification $r = -0.349$ ($p < 0.1$).

Table 15. *Pearson Product Correlation between Baseline Barriers Statements and PCPs' Documentation (n=27)*

Items	Identification	Management
Lack of motivation among patients	-.495***	.219
Lack of time during encounters	.134	-.070
Lack of insurance reimbursement for weight management	-.041	.191
Sensitivity of patients to weight issues	-.255	.124
Lack of ancillary and community resources	-.073	.362*
Lack of training in effective communication about obesity	-.349*	.013
Lack of knowledge and skills in weight management	-.280	-.008

* Statistical significance demonstrated: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

To determine if the multifaceted intervention improved PCP's attitudes in discussing obesity treatment, the results from the survey were compared from baseline to follow-up. The results for the follow-up surveys are also presented for the three sections of the survey: attitudes, confidence and barriers to obesity management. In addition, the final data on the obesity documentation was presented for the identification and management of overweight and obesity, and two graphs showing the progression from month to month comparing the control and intervention groups for documentation of identification and management.

The follow-up survey results were presented for the attitude section of the survey showing the number of PCPs that "agreed" with each statement and the percentage of PCPs that "agreed" (Table 16). We see with the first statement "providers can help obese patients achieve a

healthier weight” that 100% of the PCPs “agreed” with this statement in both the control and intervention groups. Nevertheless, for the statement “I feel confident in assisting patients with weight management”, of all PCPs, 76% agreed with the statement. In the control group, 73% agreed with statement and 79% of the intervention group agreed. The Chi-square test was used to compare the group responses for each statement demonstrating no significant group differences at follow-up (Table 16).

Table 16. *Number (Valid Percentage) Agree with Attitude by Group at Follow-Up*

Items	Total	Control	Intervention	P-Value*
Providers can help obese patients achieve a healthier weight	26/26 (100)	11/11 (100)	15/15 (100)	.
Losing weight is primarily a patient’s responsibility	21/26 (81)	8/11 (73)	13/15 (87)	.620
Lifestyle changes are effective in helping obese patients lose weight	25/26 (96)	11/11 (100)	14/15 (93)	1.00
I feel confident in assisting patients with weight management	19/25 (76)	8/11 (73)	11/14 (79)	1.00
Medications are effective in helping obese patient lose weight	12/26 (46)	7/11 (64)	5/15 (33)	.126
Medications for weight loss are safe	6/26 (23)	4/11 (36)	2/15 (13)	.348
Bariatric surgery is effective in helping obese patients lose weight	23/26 (89)	9/11 (82)	14/15 (93)	.556
Bariatric surgery for weight loss is safe	14/26 (54)	5/11 (46)	9/15 (60)	.462

* Control versus Intervention

The results from the baseline (Table 10) and follow-up survey (Table 16) statements addressing PCPs' attitude in discussing obesity were compared statement by statement with the McNemar's test in Table 17. These results were calculated for the total PCP participants and then separately for the control and intervention groups. However, in all groups it was determined there were no significant changes in response from pre to post. The results were also compared from baseline (Table 10) to follow-up (Table 16) showing the degree of change in percentage statement by statement. For the statement "I feel confident in assisting patients with weight management," the intervention PCPs showed a 26% increase in agreement from baseline to follow-up, but this change was not statistically significant because the associated p-value was 0.375 (Table 17).

Table 17. *McNemar P-Values for change from baseline to follow-up for Attitude Statements and Change in Percentage Agreement from baseline to follow-up by Group*

Items	Total	Control	Intervention
Providers can help obese patients achieve a healthier weight	* 11%	* 0%	* 20%
Losing weight is primarily a patient's responsibility	.289 17%	1.00 13%	.375 20%
Lifestyle changes are effective in helping obese patients lose weight	.500 7%	* 9%	1.00 6%
I feel confident in assisting patients with weight management	.727 22%	1.00 18%	.375 26%
Medications are effective in helping obese patient lose weight	.453 11%	1.00 9%	.625 11%
Medications for weight loss are safe	1.00 4%	1.00 9%	1.00 0%
Bariatric surgery is effective in helping obese patients lose weight	1.00 4%	1.00 -9%	.500 13%
Bariatric surgery for weight loss is	.688	1.00	1.00

safe	8%	10%	13%
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* Values cannot be calculated because the results for the control and intervention groups were the same. The *p*-value cannot be determined since no comparison can be made between the groups.

The follow-up survey results were presented for the confidence section of the survey showing the number of PCPs that “agreed” with each statement and the percentage of PCPs that “agreed” (Table 18). We see with the first statement in which the PCPs rate their confidence in discussing “lifestyle modifications” that 100% of the PCPs “agreed” with this statement in both the control and intervention groups (Table 18). Nevertheless, for the statement in which PCPs rate their confidence in discussing “medications” for weight loss, for all PCPs, 54% agree with the statement. In the control group 55% agree with the statement and 53% of the intervention group agree (Table 18). The Chi-square test was used to compare the group responses for each statement and demonstrated no significant differences between the two groups at follow-up (Table 18).

Table 18. *Number (Valid Percentage) Agree with Confidence in Discussing Treatments by Group at Follow-Up*

Items	Total	Control	Intervention	P-Value*
Lifestyle modifications	26/26 (100)	11/11 (100)	15/15 (100)	.
Medications	14/26 (54)	6/11 (55)	8/15 (53)	.951
Commercial weight loss programs	13/26 (50)	3/11 (27)	10/15 (67)	.047
Bariatric surgery	20/26 (77)	9/11 (82)	11/15 (73)	1.00

* Control versus Intervention

To determine if the multifaceted intervention improved PCPs’ confidence in discussing obesity treatment, each statement from the survey was calculated showing the “agree” results for the baseline (Table 11) and follow-up survey (Table 18). The results from the baseline and follow-up survey statements discussing PCPs’ confidence in discussing obesity were compared

statement by statement with the McNemar's test in Table 19. These results were calculated for the total PCP participants and then separately for the control and intervention groups. However, in all groups it was determined that there were no significant changes in responses from baseline to follow-up. The results were also compared from baseline (Table 11) to follow-up (Table 18) showing the degree of change in percentage statement by statement (Table 19). For the statement discussing confidence in discussing bariatric surgery, the intervention group showed an increase of 7% in agreement, but this change was not statistically significant because the associated p-value was 1.00 (Table 19).

Table 19. *McNemar P-Values for change from baseline to follow-up for Confidence Statements and Change in Percentage Agreement from baseline to follow-up by Group*

Items	Total	Control	Intervention
Lifestyle modifications	* -4%	* 0%	* -7%
Medications	1.00 0%	1.00 9%	1.00 -6%
Commercial weight loss programs	.289 -15%	1.00 0%	.219 -27%
Bariatric surgery	1.00 4%	1.00 0%	1.00 7%

* Values cannot be calculated because the results for the control and intervention groups were the same. The *p*-value cannot be determined since no comparison can be made between the groups.

The follow-up survey results were presented for the barriers section of the survey showing the mean and standard deviation values (Table 20). The mean is gathered from a 1-10 point scale. The results demonstrate at follow-up PCPs consider their greatest barrier to obesity management as “lack of time during encounter” (mean of 7.9 for all PCPs). They also considered “lack of motivation among patients” (mean of 7.4 for all PCPs) and “lack of ancillary and community resources” (mean of 6.3 for all PCPs) as significant barriers to obesity management.

Comparing the groups using the independent sample t-test determined no significant differences in perceived barriers between the two groups at follow-up.

Table 20. *Mean (SD) Barriers to Addressing Weight by Group at Follow-Up*

Items	Total	Control	Intervention	P-Value*
Lack of motivation among patients	7.4 (2.4)	7.2 (2.6)	7.5 (2.3)	.718
Lack of time during encounters	7.9 (2.3)	7.3 (2.9)	8.3 (1.7)	.250
Lack of insurance reimbursement for weight management	5.2 (2.5)	4.5 (2.2)	5.8 (2.7)	.187
Sensitivity of patients to weight issues	5.2 (2.0)	4.6 (2.0)	5.6 (1.9)	.227
Lack of ancillary and community resources	6.3 (2.4)	5.7 (2.7)	6.7 (2.1)	.326
Lack of training in effective communication about obesity	5.0 (2.2)	5.4 (2.8)	4.7 (1.6)	.630
Lack of knowledge and skills in weight management	4.9 (2.2)	5.1 (2.7)	4.7 (1.8)	.637

* Control versus Intervention

To assess if the multifaceted intervention had an effect on the PCPs' obesity barriers in the survey, the means for each statement were compared from baseline (Table 12) to follow-up (Table 20) using the paired t-test. This determined there was no change in groups from baseline and follow-up (Table 21). The results were also compared from baseline (Table 12) to follow-up (Table 20) showing the degree of change in mean values of PCPs' scores for each barrier statement (Table 21). For the barrier statement "lack of motivation among patients", the intervention group decreased their barrier by 0.5 (-0.5). However, this change was not significant because of the associated p-value was 0.88 (Table 21).

Table 21. *Paired t-test P-Values for change from baseline to follow-up for Barriers Statements and Degree of change in Mean from baseline to follow-up by Groups.*

Items	Total	Control	Intervention
Lack of motivation among patients	.295 -0.4	.819 -0.2	.088 -0.5
Lack of time during encounters	.497 0.3	.386 0.8	.872 0
Lack of insurance reimbursement for weight management	.569 0.4	.391 0.8	.946 0.1
Sensitivity of patients to weight issues	.428 -0.4	.747 -0.2	.444 -0.5
Lack of ancillary and community resources	.696 -0.2	.583 -0.4	1.00 0
Lack of training in effective communication about obesity	.554 -0.3	.111 -1.3	.372 0.5
Lack of knowledge and skills in weight management	.606 -0.3	.262 -1	.442 0.3

With regard to the impact of the multifaceted intervention on documentation of overweight/obesity identification and management, the intervention group improved their documentation on obesity identification from 10% at baseline (Table 9) to 13% at follow-up (Table 22). However, the control group's performance remained essentially unchanged from 9.0% at baseline (Table 9) to 10% at follow-up (Table 22). When calculating the paired t-test for change from baseline to follow-up for obesity identification in the intervention group, this result was not significant ($p = 0.284$). With the documentation of obesity management, the intervention group documentation increased from 10% at baseline (Table 9) to 15% at follow-up (Table 22). However, the control group documentation remained similar, from 5% at baseline (Table 9) to 7% at follow-up (Table 22). When calculating the paired t-test for change from baseline to

follow-up on the obesity management in the intervention group, there was sufficient evidence to conclude this result was significant ($p < 0.001$).

The follow-up documentation demonstrated that for the total sample population ($n=27$), PCPs identified 12% of the patients and managed 12%. At follow-up, the control group identified 10% of patients and managed 7%. At follow-up, the intervention group identified 13% of patients and managed 15% (Table 22). The two groups were compared using independent sample t-test. The result for the obesity identification was not statistically significant ($p = 0.136$). The result for the obesity management was statistically significant ($p = 0.007$) (Table 22).

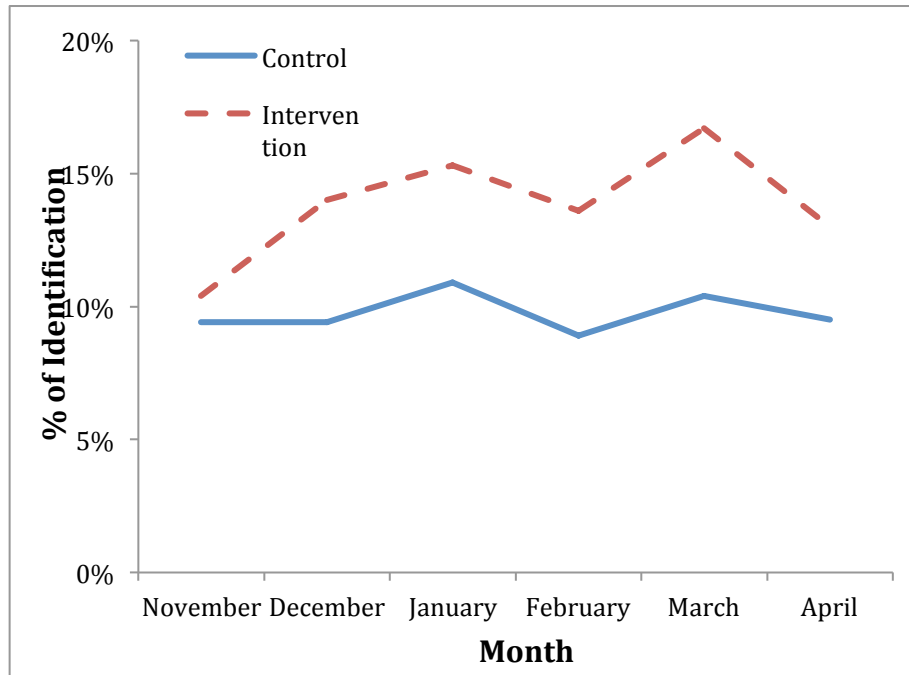
Table 22. Mean (SD) Performance Data at Follow-Up

Items	Total	Control	Intervention	P-Value ^a
Proportion of Identification	12%	10%	13%	.136
SD	(.06)	(.05)	(.06)	
N	27	11	16	
Proportion of Management	12%	7%	15%	.007
SD	(.08)	(.04)	(.09)	
N	27	11	16	

^a Control versus Intervention

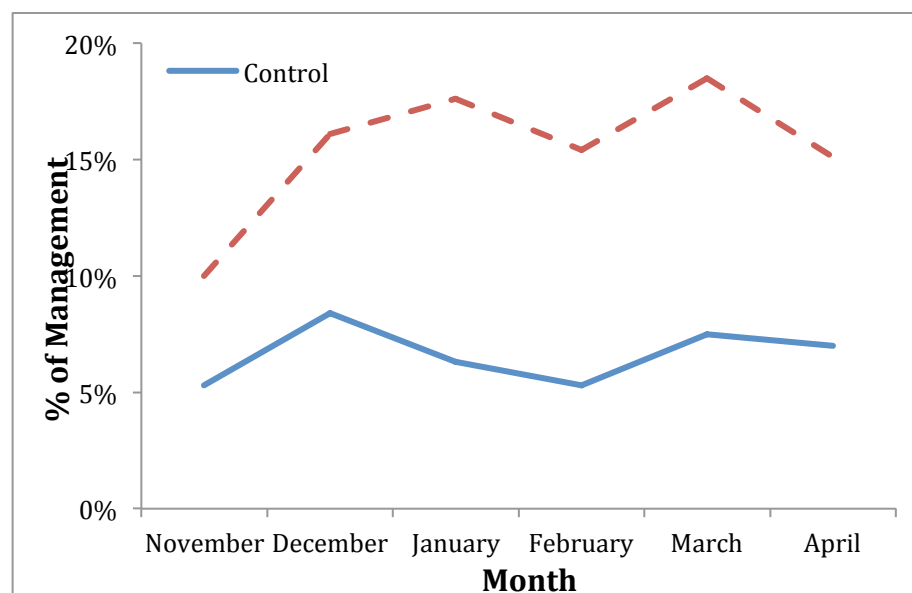
To assess how quickly documentation behavior changed in response to the multifaceted intervention, the monthly obesity scorecard was used and the data were presented in a graph showing the obesity identification (Figure 1). From November to January, there was an improvement in obesity identification from 10% to 15%. In March, obesity identification peaked at 16% and then in April identification declined to 13%. On the other hand, for the control group, the obesity identification stayed at 10% during all four months (Figure 3).

Figure 3. *Proportion of PCPs' patient encounters that had Obesity Identification documented by Time Period and Group.*



A graph was also done to demonstrate how documentation of the obesity management changed over the months (Figure 4). From November to January, there was an increase in obesity management from 10% to 16%. In March, obesity management increased to 17% and the last month documentation of management decreased to 15%. Nevertheless, in the control group, the obesity management stayed in the range of 6-7% over the four months (Figure 4).

Figure 4. *Proportion of PCPs' patient encounters that had Obesity Management documented by Time Period and Group*



Summary

Overweight and obesity are a major epidemic in the United States. Nevertheless, PCPs do not regularly follow the recommended guidelines and offer obesity management to their patients. Within a large FQHC in the Northeast, data demonstrates that PCPs have a 10% adherence with obesity identification and an 8% adherence with obesity management. This randomized control trial examined the effect of a multifaceted intervention on PCPs' attitudes about obesity, confidence in addressing obesity, and barriers to obesity management. It also examined the effect a multifaceted intervention on PCPs' obesity documentation. The results of the survey showed only 54% of PCPs report confidence in assisting patients with weight loss. PCPs also describe multiple barriers to obesity management, with the highest ranked barriers being lack of time during the encounter, followed by lack of motivation among patients.

The intervention and control group survey results were compared and demonstrated there was a statistically significant difference in terms of the patient population the PCPs' served.

However, there were no significant differences between the intervention and the control groups at baseline for the other survey results. Furthermore, the survey results were compared to the PCPs' documentation using the Spearman rank correlation coefficient to show if there was an association between PCPs' attitudes and barriers, and PCPs' performance. Various significant findings were found from the correlations. PCPs who believed they could help patients lose weight and that lifestyle changes were effective in helping obese patients lose weight were more likely to identify overweight/obese patients. In addition, PCPs who considered higher ranked barriers to obesity management lack of motivation among patients and lack of PCP training in effective communication on weight loss were less likely to identify overweight/obese patients. Nevertheless, the PCPs who considered a higher ranked barrier lack of ancillary and community resources for weight loss were more likely to assist their patients with weight loss by offering weight management services.

To determine if the multifaceted intervention improved PCPs' attitudes, their confidence in addressing obesity, and barriers to obesity management, the results from the pre and post survey were compared and demonstrated no significant change in groups from pre to post. With regard to obesity documentation, the intervention group improved their obesity identification from 10% to 13% and their obesity management from 10% to 15%; whereas, changes in control group documentation in these same two areas were not statistically significant.

Chapter 5

Discussion

The purpose of this randomized controlled trial was to study the implementation of a multifaceted quality improvement intervention to help PCPs improve their identification and management of overweight and obesity. This study included 27 PCPs, who care for adult patients, at a large FQHC. This chapter will discuss the implications of the findings for each research question. The chapter will also describe an evaluation of the theoretical model, the implications for practice, and the study limitations.

General Considerations

The quality improvement study took place over a six-month period as planned. Sources for measures included an obesity attitude questionnaire and EHR documentation of obesity identification and management. The multifaceted intervention strategy included an interactive educational workshop, educational outreach visits, and performance measurement and feedback of patient care data. The content discussed in the interactive educational workshop reflected overweight and obesity evidence based practice guidelines, which include the 2011 World Health Organization (WHO) guidelines and the 2008 National Heart, Lung, and Blood Institute guidelines (NHLBI) on obesity management. In addition, evidenced based practice recommendations on intensive lifestyle modifications, medication management for weight loss and bariatric surgery were discussed. The workshop was presented in a small group using an interactive format. Van Hoof (2009) encourages “interaction” as an essential strategy in a program to promote the learners’ engagement with the material, as engagement is essential for deep learning and, in turn, for changes in clinical performance. The workshops appeared to be engaging, as participants shared barriers to managing obese patients. The interactive format also

allowed participants to address their individual knowledge gaps and to reflect on practice guidelines through “interpersonal channels” of discussion (Rogers, 2003). The format was also an effective springboard to discuss performance gaps and barriers to care within the organization and to encourage PCPs to improve their documentation.

The second intervention was performance measurement and feedback of patient care data. For four consecutive months, the PI emailed a performance scorecard to each PCP with an analysis of their patient care documentation along with peer and benchmark comparisons. Performance measurement and feedback of patient care data, also known as audit and feedback, is a method used in quality improvement initiatives to prompt PCPs to modify their practice behavior when given feedback that demonstrates their clinical practice is below the desired goal (Ivers et al., 2012). These performance scorecards for the intervention group illustrated small but significant improvements in performance from month to month.

Performance measurement and feedback of patient care data is a method periodically used within the study setting, and such data are routinely distributed through email. The email is a convenient method of feedback, as it does not require a scheduled meeting, which competes with patient care. However, since it is delivered as an email, the email could be disregarded or not fully reviewed. Ivers et al. (2012) explain that there is more significant improvement in performance if: (1) the initial baseline performance is low, (2) the source of delivery is from a senior colleague or supervisor, (3) the delivery is both verbal and written, (4) the feedback occurs more than once and, (5) the feedback includes explicit target goals. In this study, the initial performance for all PCPs was low. Nevertheless, the PI that delivered the performance scorecard was not a senior colleague or supervisor. The performance was delivered in written format, but not verbally. The performance scorecard was given out four times, with benchmark

comparisons serving as the explicit target or goal. Taking these factors into consideration in future studies, the PI would recommend the performance measurement and feedback of patient care data be delivered through email and verbally and involve a senior colleague or supervisor.

The third intervention was educational outreach visits. The PI aimed to meet twice with each PCP in the intervention group during the four-month intervention phase. These meetings took place over the phone and lasted approximately 10 minutes. All PCPs received the first visit, and most received the second visit. The educational outreach visits provided time for the PCPs to discuss their experiences with managing obese patients and to reveal any barriers they faced. In addition, the PI used the time to offer PCPs brief performance feedback and to educate them on ways to improve their documentation. Forsetlund et al. (2009), in an extensive review of the literature on continuing education, found that a combination of interactive education and didactic education is most effective. During phone meetings, the PI found PCPs to be quite engaged in the conversations. PCPs were open to sharing their experiences and frustrations with managing obese patients. The time was also helpful to PCPs to ask questions about the obesity guidelines. In addition, the one-on-one, personal format of these sessions encouraged commitment to the project. Van Hoof & Meehan (2011) consider important strategies in continuing education to include commitment to change, through which participants are asked to change a specific behavior as a result of an educational activity. The PI, toward the end of the educational outreach visit, asked each PCP if he or she could commit to improving their documentation by 2% over the next month. This goal was easily met by some PCPs, but other PCPs found it challenging.

Scheduling educational outreach visits proved challenging. The PI corresponded via email with the 16 intervention PCPs to find a time in which each PCP could meet by phone. Most PCPs had extensive patient care demands and other time constraints, thus limiting their

availability. Many PCPs in the intervention group requested the ability to use protected (paid) time to meet with the PI; however, the FQHC leadership did not approve this request.

Mansouri & Lockyer (2007) published a meta-analysis on the effectiveness of continuing education (CE) activities and concluded that CE activities have a moderate effect on improving PCPs' knowledge and a small effect on improving PCPs' performance and patient outcomes. However, there was a larger effect on PCPs' knowledge and performance when a multifaceted intervention strategy was used that included interactive small group sessions, auditing and peer group discussions, and outreach visits.

In this study, the quality improvement strategy brought about small but meaningful results in the intervention group. This multifaceted intervention strategy was a new way of carrying out CE and QI within the organization in which the study took place. Program developers should consider shifting the format of educational meetings to include more time for interaction and discussion and less time spent on passive, didactic lectures. Complementing interactive workshops with other interventions, such as performance measurement and feedback of patient care data and educational outreach visits, is also recommended.

Discussion of Research Questions

1. What is the current pattern of behaviors related to overweight/obesity documentation and management among PCPs in a FQHC organization?

At baseline, PCPs identified only 10% of overweight/obese patients and managed only 8%. These results demonstrate that PCPs fail to adequately discuss and document overweight and obesity management. Other studies in the literature show sub-optimal overweight and obesity management in primary care, but the baseline results for this study were even lower than other studies. In a prospective cross-sectional study of 289 patients in seven family practice

clinics, obese patients were identified and diagnosed 24.4% of the time at baseline (Melamed, Nakar & Vinker, 2009). Baer (2013) evaluated the documentation and diagnosis of overweight and obesity among adult patients within 25 primary care practices. Their results showed that overweight patients (BMI 25-30 kg/m²) and obese patients (BMI 30 kg/m² and above) were diagnosed on problem list 17.1% and 30.1% of the time, respectively.

Medicare and Medicaid provide financial incentives for PCPs to offer high-quality care (Blumenthal & Tavernal, 2010). Based on specific clinical quality measures, the financial incentives are part of a program (i.e., Meaningful Use of Health Information Technology or simply “meaningful use”) to help providers to use technology to improve the quality and efficiency of primary care (Blumenthal & Tavernal, 2010). Overweight and obesity management is part of the 2014 clinical quality measures, “Body Mass Index (BMI) screening and follow-up” (2014 Clinical Quality Measures, 2014). This study highlights the need for PCPs to enhance their management of overweight and obesity to help patients improve their quality of life and to decrease morbidity and mortality. PCPs need to shift their model of patient care from curing disease to preventing disease, such as the early identification of overweight and obesity.

2. What are current PCPs’ attitudes and barriers regarding identification and management of overweight and obese patients?

With regard to PCPs’ attitudes and barriers to managing obesity, the results from the survey showed PCPs have poor attitudes toward managing obesity, and this is consistent with the findings from another study (Salinas et al., 2011). In Salinas et al. (2011), only 31% of PCPs agreed with the statement “I feel confident in assisting patients with weight management.” The PCPs in the Salinas et al.’s (2011) study considered lifestyle changes and bariatric surgery the most effective methods available for patients to lose weight. In addition, they determined the

largest barrier to managing obesity was lack of motivation among patients, followed by lack of time during encounters.

This study found that 89% of PCPs believed “Providers can help obese patients achieve a healthier weight.” Nevertheless, only 54% agreed with the statement “I feel confident in assisting patients with weight management.” This demonstrates that even though PCPs believed they were useful in helping patients lose weight, PCPs felt only moderately confident in their ability to manage obesity. In the section of the survey in which PCPs describe what methods of weight loss they consider most effective, PCPs rated lifestyle modifications (96%) and bariatric surgery (81%) relatively high. Finally, the most significant barriers to managing obesity were lack of time during an encounter, followed by lack of motivation among patients. PCPs also identified lack of ancillary and community resources as another significant barrier.

During the discussions at the workshop and educational outreach visits, PCPs expressed frustration with managing obesity. The reoccurring theme was a desire to help patients lose weight but insufficient time to do so. The patients presented with multiple complaints during the 12-minutes, on average, patient visits, and patients usually had other comorbidities such as diabetes and hypertension. Time constraints did not allow for the PCPs to discuss weight loss. As a case in point, one PCP shared she went into healthcare thinking she would be able to “promote health and discuss wellness,” but found herself trying to “extinguish fires” the majority of the day with patients having urgent health complaints and uncontrolled chronic diseases that required more immediate attention. PCPs also shared they found that many patients actually did not consider their weight to be an issue and had little motivation to change it.

These results reveal a need for more education of PCPs in various areas of obesity management. PCPs could benefit from increased strategies, such as motivational interviewing, to

help patients overcome their lack of motivation (Bishop & Jackson, 2013; Quirk, Dickinson et al., 2010). If PCPs had more skill in motivating their patients, PCPs' intention to address obesity might increase.

3. Is there a relationship between PCPs' attitudes about obesity management and their behavior/documentation regarding overweight and obesity identification and management?

An analysis was done to determine if there was an association between PCPs' attitudes and barriers and PCPs' performance. Using the Spearman rank correlation coefficient, the survey results were compared to the baseline overweight/obesity identification and management. First, the section of the survey that addressed PCPs' attitudes was compared to the documentation. Three statements were significant. The statement "providers can help obese patients achieve a healthy weight" showed a statistically significant association to the documentation of obesity identification. This is important because it signifies that PCPs who believe that they can help obese patients achieve a healthy weight are actually more likely to identify their overweight/obese patients. The second and third statements, "lifestyle changes are effective in helping obese patients lose weight" and "bariatric surgery for weight loss is safe," also showed an association with the identification of overweight/obese patients. This is important because they signify that PCPs who believe that there are effective methods of weight loss are more likely to identify patients who would benefit from these services.

Secondly, the section of the survey that addressed PCPs' confidence in discussing obesity was compared to the documentation. All values showed no significant association ($p > 0.05$). This demonstrates that PCPs' perceived confidence in obesity management appears to have no relationship to how they document obesity identification and management.

Thirdly, the section of the survey that addressed PCPs' barriers to obesity management was compared to the documentation. Three statements were significant. The statement in which PCPs consider the barrier "lack of motivation among patients" was associated with decreased documentation in obesity identification. This is important because it demonstrates that PCPs that believe patients do not want to lose weight do not make an effort to identify those patients as overweight/obese. In addition, higher PCP ranking of "lack of ancillary and community resources" was associated with a higher frequency of documented obesity management. This is important because it shows that PCPs that believe that patients who lack community resources for weight loss deserve more attention by PCPs and will take increased responsibility for helping patients with weight loss by discussing obesity management. Higher PCP ranking of "lack of training in effective communication about obesity" was associated with a lower frequency of documented obesity identification. This signifies that the PCPs who consider lack of training as a more significant barrier to obesity management are among those who are least likely to document obesity management. One conclusion from this appears to be that PCPs who themselves had less training are less inclined to offer help to patients with weight loss.

These findings suggest that PCPs who believe they can help patients lose weight, and who believe that lifestyle changes are effective in helping patients lose weight, are more likely to identify overweight/obese patients. PCPs who report more significant barriers to obesity management stemming from lack of motivation among patients and from lack of PCP training in effective communication about weight loss are less likely to identify overweight/obese patients. In addition, the PCPs who report more significant barriers to the availability of ancillary and community resources are more likely to offer weight management services themselves.

In the literature, various studies have examined PCPs' attitudes and barriers to obesity management (Corri, 2012; Davis, Shishodia, et al., 2008; Epling, Morley et al., 2011; Rurik, Rinfel et al., 2013) and PCPs' practice patterns with obesity management (Farran et al., 2013; Bleich, Pickett-Blakely, & Cooper, 2011; Bardia, Holtan, et al., 2007). However, no published studies appear to have examined the association between PCPs' attitudes and barriers about obesity management and their practice patterns. Because this study had a small sample size, we hesitate to draw firm conclusions, but the statistically significant findings suggest the need for further investigation of such associations.

4. Does a multifaceted intervention to address PCPs' attitudes and behavior improve overweight and obesity documentation?

The baseline and follow-up survey results were compared to determine if the multifaceted intervention had an impact on PCPs' attitudes, barriers, and confidence in discussing obesity. However, there was no significant change from baseline to follow-up. This indicates the multifaceted intervention did not appear to have any effect on PCPs' attitudes and barriers. However, given the small sample size, achieving statistical significance was unlikely in the absence of a large difference. With regard to obesity documentation, after the six-month multifaceted intervention, the results showed improvement in obesity identification in the intervention group from 10% to 13% and improvement in obesity management from 11% to 15%. The findings are consistent with the literature, though the improvements in this study are on a smaller scale.

Based on a single educational session with follow-up measurement at three months, Farran, et al. (2013) implemented a quality improvement project to help PCPs from three primary care clinics improve their management of obesity. PCPs' documentation of diagnosis of

overweight and obesity improved from 24% to 55% and documentation of a management plan improved from 5% to 20%. In Ferran et al. (2013) there were seven PCPs, and they analyzed 210 encounters prior to the educational session and 210 encounters three months after for the final data. They also involved clinical staff in the training and in assisting with implementing the guidelines in practice. Some of these other contextual variables may have influenced the different results. In this study there were 27 PCPs that were randomized to control and intervention groups, but every overweight/obese adult encounter was included, which came to 3,000 to 4,000 encounters at baseline, every month thereafter and for the final data, six months after. In addition, in this study, clinical staff were not involved in the multifaceted intervention strategy, as in the culture of the organization where the study took place, PCPs are responsible for obesity management. However, involving support staff is a very effective way to incorporate obesity management and could potentially be a feasible option for future studies.

Dunlop et al. (2007) evaluated pediatric PCPs' obesity documentation before and after an obesity training session and office-based obesity dissemination tools. Participants were physicians from six community based primary care clinics. Results three months after the initial training showed no significant improvement in documentation, but during the subsequent three months, with further training in which they were explained obesity intervention strategies and given more tools, PCPs' documentation improved significantly. Obesity diagnosis improved from 11.6% at baseline to 28.8% ($p < 0.01$) at six months and counseling on nutrition and physical activity improved from 33.3% to 47.7% ($p < 0.01$) (Dunlop et al., 2007). In Dunlop et al. (2007), the office staff was also trained at the three-month follow-up, and began their involvement with obesity identification for PCPs to facilitate obesity management. This variable could have potentially impacted the improved documentation significantly. In this study only

well-child visits were extracted, and the nature of a well-child visit carries a focus on prevention, which can also account for the larger focus on obesity identification and management (Dunlop et al., 2007). These variables carry impact when comparing them to this study, which did not involve office staff, and included all visits encounters, not only well visits.

This study revealed that a multifaceted intervention is useful and effective at improving PCPs' behavior. Reflecting an outdated paradigm (Van Hoof & Meehan, 2011), current continuing education for PCPs at the FQHC is passive, with few opportunities for interaction. Furthermore, continuing education is focused on knowledge rather than on clinical performance or patient outcomes. Van Hoof & Meehan (2011) encourage a paradigm shift in continuing education that is focused on improving clinician behavior and patient outcomes. The authors also emphasize the need for more effective teaching interventions in continuing education that takes into account contextual factors. Examples of contextual factors include the learners' motivation, baseline performance, importance of the clinical topic, and the characteristics of the organization and educational activity (Van Hoof & Meehan, 2011).

Evaluation of Theoretical Model

The *Theory of Planned Behavior* (TBP), by Ajzen (1991) was used as the theoretical framework to help understand PCPs' attitudes, beliefs, and behaviors. This model proved valuable to understand PCPs' behavior as it relates to obesity documentation. The TBP aims to help interpret and explain human behavior in a specific context. Ajzen (1991) considers three different elements that help predict intention and behavior: attitude, subjective norm, and perceived behavioral control. Each of these elements was considered for the purpose of this research.

An “attitude” toward a behavior is determined by the person’s interest in the behavior (Ajzen, 1991). To understand PCPs’ attitudes, the PI used the “PCP Attitudes and Practice Patterns in Management of Obese Adults” survey (Salinas, 2011). With the survey, the PI was able to assess PCPs’ attitudes about managing obesity and assess barriers to managing obesity. This helped the PI further understand the PCPs’ behavior and the specific context in which they work that affect their behavior.

The “subjective norms” refer to the social pressure on the person to perform the behavior (Ajzen, 1991). This element was taken into consideration by incorporating the performance measurement and feedback of patient care data as an intervention in the quality improvement project. The performance scorecards served a dual function. Not only did it help the PCPs increase their awareness of their own obesity documentation/behavior, but the scorecard served as a form of social pressure to perform the behavior. The PI included peer and benchmark comparisons on the scorecard to enhance the feedback and to motivate the PCPs to improve their behavior (Van Hoof & Meehan, 2011). In addition, it could also have served as a social pressure (Ajzen, 1991).

The “perceived behavioral control” takes into consideration the person’s perceived ease or difficulty in performing the behavior (Ajzen, 1991). To assess PCPs “perceived behavior control,” the PI gathered information in the survey about the barriers the PCPs experience in managing obesity. The PI also had two “educational outreach sessions” with each PCP. These sessions were useful for the PI to further understand what the PCPs perceived as their barriers to performing the behavior.

Ajzen (1991) states that typically the stronger the individual’s attitude, subjective norm, and perceived behavior control are (the “predictors”); the more likely he will perform the

recommended behavior. By altering these predictors, one can increase the likelihood of a person intending to comply with a desired behavior (Ajzen, 1991). With this in mind, during the interactive education workshop the PI openly discussed the attitudes and barrier survey results with the PCPs and shared the baseline poor obesity documentation/behavior. This served as a “needs assessment” to illustrate to the PCPs their performance gaps and their identified barriers with the aim that the PCPs would see their need for improvement (Van Hoof & Meehan, 2011). In addition, during the EBP education intervention, the PI sought to develop the PCPs’ competence by discussing the evidence on obesity management in a small group interactive setting.

The TBP relates well to PCPs’ treatment decisions and behaviors. Evidence based practice guidelines are in place to direct PCPs to provide the highest level of patient care. Nevertheless, PCPs channel these practice guidelines through their attitudes, subjective norms and perceived behavioral control. By making these predictors more attractive, there is a larger chance of PCPs will follow the guidelines and improve their performance.

Implications for Practice

This study generates new knowledge on applicable measures for managing obesity and improving access to care for overweight and obese patients. Obesity is an increasing epidemic in our nation that leads to multiple adverse medical complications. Effective treatment guidelines are available to help patients lose weight and to decrease risk for the associated comorbidities.

While findings from this study demonstrate that PCPs’ management of obesity is low, the multifaceted intervention strategy used in this study helped PCPs to improve their management of obesity. This is a promising finding that builds on existing evidence of the importance of

multifaceted strategies. The study also found that PCPs are willing to consider the barriers they have to obesity management and try to overcome them.

Unfortunately, many barriers exist to obesity management. PCPs reported one of the major barriers being lack of time during encounter to discuss weight loss; they also considered patients' lack of motivation a significant barrier. Another important barrier that many PCPs discussed was lack of ancillary and community resources such as registered dietitians or weight loss programs. Taking these barriers into consideration, the PI proposes that more time be allocated to PCPs for preventative visits such as for a yearly adult physical. In the organization in which the study took place, all visits were allocated the same amount of time. Continued education focused on helping PCPs overcome identified knowledge gaps in the area of obesity management should include motivational interviewing, nutrition, bariatric surgery, and pharmacotherapy for weight loss. In addition, more ancillary resources, such as having a registered dietitian within the primary care office available to see patients, would be an empowering resource for PCPs.

At an organizational level, these findings are also relevant and useful. Obesity is a condition that is tied to important quality indicators associated with an accountable care organization (ACO) establishment and a patient-centered medical home (PCMH) recognition. Depending on performance, provider organizations are able to receive financial payments from Medicare and Medicaid if successfully meeting performance expectations on specific quality measures (Blumenthal and Tavenner, 2010). This study utilized a multifaceted intervention strategy to help PCPs improve their identification and management of overweight/obesity, and could be useful to organizations that are looking to help their PCPs improve their obesity management.

Limitations

This section addresses the various limitations of the study, including limitations in the study's design, implementation, and analysis. Starting with design limitations, the study had a small sample size and patient data were not evaluated for demographics or improvement in weight. Secondly, the possibility of cross contamination and the participants in the interactive educational workshop receiving different methods of presentation delivery could be an implementation limitation. Finally, two analysis limitations are that more specific statistical analysis methods could have been used and the inability of the EHR to extract accurate obesity documentation data.

1. Design Limitations:

One study design limitation was small sample size. The PI sought to address this limitation by recruiting all the PCPs within the organization in order to have the largest sample size possible. Despite recruitment efforts across an entire multisite FQHC, the relatively small number of participants limited statistical analysis and may have been under-powered to determine impact. Having a smaller sample size may have influenced the survey results not being statistically significant. Future studies should oversample and/or recruit a larger provider sample in order to detect important changes as a result of the intervention.

Another study design limitation was that patient data were not evaluated for demographics or improvement in weight. The patients' demographics might have impacted the PCPs' choice to discuss obesity or not. However, this limitation was not anticipated prior to implementing the study. In addition, patient data were not extracted to evaluate if patients weight improved, as more than six months would have been necessary to determine improvement in patient weight. For the purpose of this study, the PI did not seek to control these limitations as

the focus on the research was on PCPs. However, these factors could be of great interest for future research studies.

2. Implementation Limitations:

One study implementation limitation was possible cross contamination. The PCPs were randomized individually, but not by clinic, conceivably leading to some control PCPs benefiting from the intervention strategy. The PI anticipated this possible limitation when recruiting PCPs. The PI asked PCPs that were assigned to the intervention group to not discuss their involvement in the research with the control group. Assigning different clinics to be in the control or intervention group with a cluster sampling strategy might have decreased the possibility of cross contamination.

Another study implementation limitation was participants in the interactive workshop receiving different methods of presentation delivery. The PI sought to address this limitation by actively involving all participants that were involved whether by videoconference, in person or by phone. The PI encouraged participants to attend in person one of the four sessions that were offered at the different locations. However, some PCPs were not available to attend the days it was offered at their site so they attended virtually. For future studies, one alternative would be to offer more sessions within the different locations. Another possibility with a larger sample size would be to analyze for differences in the receipt of the interactive workshop. Finally, another alternative would be to have all participants receive the same method of delivery to decrease the possibility of some participants receiving a more or less effective intervention.

3. Analysis Limitations:

One study analysis limitation was the need to exclude seven nurse practitioner residents from the study analysis after the randomization. By elimination of the nurse practitioner

residents, the current study's inclusion/exclusion criteria were altered after data collection began, which increased the possibility of the study's validity being compromised. Exclusion of the nurse practitioner residents also led the count of participants in the control and intervention groups (11 vs. 16) to be different. In addition, "intention to treat" data analysis could have been conducted to account for the nurse practitioner residents not being included in the data analysis for the study.

Another study analysis limitation was the specification of statistical analysis methods used. The PI did not compensate for the variation in number of patient encounters that each PCP saw for each scorecard. Each scorecard analyzed all the overweight/obese encounters for the month that each PCP had. However, some PCPs may have seen dozens of patients, while others may have seen above 100 patients. By calculating the weight for each percentage proportional to the number of patients seen with a weighted regression, it would have given more weight to PCPs who saw more patients and less weight to PCPs who saw fewer patients.

In addition, to determine the effects the multifaceted intervention had on the documentation, a repeated measure of analysis of covariance would have provided more explicit data about trends in documentation over time, and could have adjusted for baseline differences between groups. However, for the purpose of this study the results were presented showing the trend in the control and intervention group from month to month in a graph, and the final data of results.

These calculations were not done as they were found to be too complex for the purpose of this study. Further statistical tests such as these could have been used to examine in more detail the study findings. However, the PI did not have the financial support to hire the appropriate personnel to conduct these extensive analyses.

The PI worked with IT to extract the data on PCPs' obesity documentation from the EHR. However, the PI discovered that accurately extracting the data is very difficult, and that the data extracted may not fully reflect what took place during the patient encounter if the data were not documented in a structured or standardized format. The PI was aware of this limitation and therefore sought to educate the PCPs in the intervention group about how to appropriately document in the EHR in a structured and standardized format. However, some PCPs did not initially change their documenting behavior. When they did not document in a structured format, the EHR was unable to extract their unstructured data, resulting in a low performance scorecard for the PCP. The PI, through the educational outreach visits, again reminded PCPs on how to correctly document.

These challenges are consistent with the literature and with the use of EHR. Sweet and Moulaison (2013) describe that when data input is not standardized it is not machine-readable. This affects EHR interoperability and impedes big data research. They recommend the systematic adoption of standards with the use of EHR. They state: "The healthcare community must examine current EHR data and metadata standards, and determine how to consistently implement them in order to improve patient care while making research possible" (Sweet & Moulaison, 2013). Other countries such as Singapore and Denmark are leading the way with these efforts by creating a more unified systematic consortium of standards with the use of their EHRs (Sweet & Moulaison, 2013).

Summary

This chapter has discussed the findings in relation to the research questions. The chapter also discussed the evaluation of the theoretical model, the implications for practice, and the limitations of the study.

Obesity is a growing epidemic in the United States PCPs need to find ways of incorporating weight loss discussions with their patients that are overweight or obese to prevent further comorbidities from developing. In addition, Medicare and Medicaid programs consider obesity management a performance condition and provide financial incentives to organizations that submit appropriate documentation.

This study did not find statistically significant differences between the pre and post intervention attitude survey. However, the study did show improvement in the intervention group's documentation of obesity identification and management. From this perspective, the multifaceted intervention strategy appeared to be effective. This model of quality improvement and continuing education can be applied to other areas in which PCPs' behavior and patient outcomes are below target. Nevertheless, a need exists for greater improvement in obesity management. There are also needed changes at the organizational level to support PCPs in offering obesity management. Such changes may include longer patient visits, training nurses and support staff to help with obesity management, and hiring more registered dietitians to be available for patient care. This study has identified important opportunities for improving care in a specific organization and for researching similar organizations.

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Appendix A

CONSENT FOR PARTICIPATION IN A RESEARCH PROJECT

Study Title: Improving Primary Care Provider Identification and Management of Overweight and Obesity in Primary Care

Principal Investigator: Sarah Knoeckel, APRN, Doctor of Nursing Practice student

Funding Source: None

Invitation to Participate and Description of Project

You are invited to participate in a research study designed to examine primary care provider's (PCPs') attitudes, knowledge, and behaviors as they relate to obesity guidelines using Ajzen's *Theory of Planned Behavior*. The research will involve a multifaceted intervention to improve the management of overweight and obesity.

The study will evaluate the impact of the interventions on obesity care practices and care quality, as well as the relationship between PCP attitude and obesity management practices. PCPs from all thirteen sites will be asked to participate in the study. PCPs' will be randomly assigned to the intervention group and the control group.

In order to decide whether or not to participate in this research study, you should know enough about its risks and benefits to make an informed decision. This consent form gives you detailed information about the research study, which I also plan to discuss with you. In our discussion, I will review all aspects of the research: Its purpose, the procedures that will be performed, any risks of the procedures, and any anticipated benefits. Once you understand the study, I will ask you to sign the consent form if you decide to participate.

Description of Procedures

If you agree to participate in this study, you will be randomly assigned to one of two study groups – the intervention group or the control group. You will have a Fifty-Fifty chance of getting into the intervention group. Both groups will complete an obesity attitude survey. The intervention group will be asked to attend an hour evidenced based interactive obesity workshop on obesity management with the PI and to participate in two 10 minute virtual one-on-one performance measurement and feedback of patient care data sessions with the PI. Participant PCPs' will also receive four monthly scorecards analyzing their obesity identification and management.

The PI will be collecting and analyzing clinical data from overweight and obese patients of control and intervention group PCPs. PCP referral data will also be collected from study participants in both groups.

Risks and Inconvenience

All information collected via the survey and eClinical Works data extractions will be kept confidential and you will remain confidential to others throughout that process. Patient data will be kept confidential under HIPAA regulations. We do not foresee any risk for you. Foreseeable

but minor inconveniences may include the time spent completing the required surveys and being involved in the educational activities associated with the interventions.

Benefits

If you agree to participate in this study, there may or may not be direct benefits to you or your patients. I hope that the information learned from this study will improve the current model of treating obesity at CHCI. I also hope that you will experience improved health outcomes with your patients and that potentially there will be improved obesity rates in the communities of patients that CHCI serves.

Confidentiality

Any data that is disclosed in connection with this study will remain anonymous. The names of subjects associated with the study will be protected and locked. Only authorized research staff will have access to the study data. The data will remain confidential and will be disclosed only with your permission or as required by U.S. or State law. Examples of information that we are legally required to disclose include abuse of a child or elderly person and certain reportable diseases. Your patients' confidentiality will be maintained in all project related activities.

When the results of the research are published or discussed in conferences, no information will be included that will reveal your identity.

Representatives from the Community Health Center Institutional Review Board (the committee that reviews, approves, and monitors research on human subjects) may inspect study records during internal auditing procedures. However, these individuals are required to keep all information confidential.

Voluntary Participation and Withdrawal

You are free to choose to participate or not in the study. If you decide to participate, you are free to withdraw at any time during its course. If you choose not to participate or if you withdraw from the study, it will not affect your employment with CHCI.

Questions

I have used some technical terms in this form. Please feel free to ask about anything that you do not understand and to consider this research and the consent form carefully – as long as you feel is necessary – before you make a decision.

Authorization

I have read this form and I have decided to participate in the project described above. Its general purposes, the particulars of involvement and possible hazards and inconveniences have been explained to my satisfaction. My signature also indicates that I have received a copy of this consent form.

Name of Subject: _____

Signature: _____

Appendix B

PCP Demographic information

Question	Answer
Current practice site:	a. Site A b. Site B c. Site C d. Site D e. Site E
Licensure you hold:	a. APRN/PA b. MD/DO
What population to do serve?	a. Family b. Pediatric c. Adult
In what year were you licensed or certified?	a. Prior to 1989 b. 1990-1999 c. 2000-2004 d. 2005-2009 e. 2010 to current
How many years have you been in practice as a PCP?	a. 1-5 years b. 6-10 years c. 11-15 years d. 16 or more

Instruments

Appendix C

Provider Attitudes about Obesity (Salinas et al., 2011)

Agree That:	1. Disagree Strongly	2. Disagree Somewhat	3. Neutral	4. Agree Somewhat	5. Agree Strongly
Providers can help obese patients achieve a healthier weight					
Losing weight is primarily a patient's responsibility					
Lifestyle changes are effective in helping obese patients lose weight					
I feel confident in assisting patients with weight management					
Medications are effective in helping obese patient lose weight					
Medications for weight loss are safe					
Roux-en-Y gastric bypass surgery is					

Appendix E

Obesity Identification and Management Presentation

1. The Uniform Data System Data about the CHC, Inc. describes 77% of the CHC, Inc. patients as overweight, obese or morbid obese. At CHC, Inc. we are documenting the identification and management plan 31% of the times. However, the national benchmark for the documentation on obesity is 39% of the times.

2. Aim of Obesity Management:

- Identify overweight or obese patients at risk for developing or worsening comorbid conditions
- Communicate the health benefits of weight loss to overweight and obese patients
- Set realistic weight loss goals with your patient
- Make appropriate recommendations for weight loss options that would most benefit your individual patient.

3. Case Study:

- 47 years old, 5'4", 245 lbs. (BMI=42 kg/m²)
- Comorbid conditions: Type 2 Diabetes, Dyslipidemia
- Medications: Metformin 1000 daily, Pravastatin 40 mg daily
- Unsuccessful weight loss with previous diet and exercise on her own

4. Epidemiology of Obesity: Approximately 2/3 of Americans are overweight or obese. It's about 111 million US adults that are overweight or obese.

5. The guidelines for Obesity are the NIH guidelines; they call for an escalation of treatment based on advancing BMI. We always start with diet, physical activity and behavior change, with pre-obesity all the way up, regardless of what BMI is.

On top of that we think about pharmacotherapy, because there are potentially more side effects and costs related to them, we consider that with a higher BMI (BMI of 30 or more). We consider bariatric surgery, yet later because of risks and costs, and typically with BMI of 40 or more.

6. Intensive Lifestyle Intervention:

The Look AHEAD trial had 300 patients; they put them on a diabetes support group, or intensive lifestyle education program. They meet with someone almost weekly in the first

few months, they also did meal replacement and recommend that they do physical activity at least 30 minutes every day of the week (Wadden et al., 2011).

What they did is they followed these patients over two years. What they found was that people were quite successful. The goal was a 7% weight loss in the first year and most people lost it (Wadden et al., 2011).

Even 4 years later, they followed up on these patients and most of the patients were able to sustain a 5-10% weight reduction. There were also improvements in the cardiovascular risk (lipids, diabetes and hypertension) correlated to their weight loss.

What you want to communicate to the patient is that we're not trying to get them back to their high school weight, we're trying to get modest amounts of weight loss (5-10%), and it can have dramatic effects on their health.

7. If lifestyle is not enough, and we see that so much with our patients, we want to think about intensifying our treatment. And the way we think about it is: lifestyle treatment, medical therapy and bariatric surgery.

When it comes to lifestyle therapy it's actually a continuum of care, you can either assess and refer (and that's acceptable). We have great nutrition services at our sites. You can also consider certain commercial weight loss programs (Weight Watchers), or Internet program.

8. Pharmacological Options:

How they work, common side effects and research trials these drugs:

- Orlistat and Phentermine
- Phentermine/Topiramate ER and Lorcaserin
- Qsymia and Belviq

9. Bariatric Surgery Options:

- Indications and contraindications.
- Different surgical procedures categorized into restrictive and restrictive/malabsorptive.
- Research trials showing outcomes of bariatric surgery.

10. Overweight and Obesity Documentation of Overweight and Obesity Identification and Management using ECW and discussion of UDS expectations.

Appendix F: IRB Approval

Community Health Center, Inc. Institutional Review Board
675 Main Street
Middletown, CT 06457
Phone: (860) 852-0834 Fax: 860-638-6765 Email: lrb@chc1.com

CHC's Institutional Review Board (IRB) Authorization Agreement

Name of Institution or Organization Providing IRB Review (Institution/Organization A):

Community Health Center, Inc.

IRB Registration #: 00007495 Federalwide Assurance (FWA) #, if any: FWA00002298

Name of Institution Relying on the Designated IRB (Institution B):

University of Connecticut

FWA #: 00007125

The Officials signing below agree that the University of Connecticut may rely on the designated IRB for review and continuing oversight of its human subjects research described below: *(check one)*

☐ This agreement applies to all human subjects research covered by Institution B's FWA.

☒ This agreement is limited to the following specific protocol(s):

Name of Research Project: Improving Provider Identification and Management of Obesity in Primary Care

Name of Principal Investigator: Sarah Knoeckel, APRN, MSN

IRB#: 1035

Sponsor or Funding Agency: _____ Award Number, if any: _____

☐ Other (describe): _____

The review performed by the designated IRB will meet the human subject protection requirements of Institution B's OHRP-approved FWA. The IRB at Institution/Organization A will follow written procedures for reporting its findings and actions to appropriate officials at Institution B. Relevant minutes of IRB meetings will be made available to Institution B upon request. Institution B remains responsible for ensuring compliance with the IRB's determinations and with the Terms of its OHRP-approved FWA. This document must be kept on file by both parties and provided to OHRP upon request.

Signature of Signatory Official (Institution A): _____

Date: 9/18/13

Print Full Name: Margaret Flinter, APRN, PhD Institutional Title: SVP/Clinical Director, CHC, Inc.

NOTE: The IRB of Institution A must be designated on the OHRP-approved FWA for Institution B.

Signature of Signatory Official (Institution B): _____

Date: 9/11/13

Print Full Name: Jeffrey R. Seemann, Ph.D.

Institutional Title: Vice President for Research

Community Health Center, Inc. Institutional Review Board

675 Main Street

Middletown, CT 06457

Phone: (860) 852-0834 Fax: 860-638-6765 Email: irb@chc1.com

May 24, 2013

Sarah Knoeckel, APRN, MSN
Community Health Center, Inc.
85 Lafayette Street
New Britain, CT 06051

RE: Improving Provider Identification and Management of Obesity in Primary Care

Dear Ms. Knoeckel,

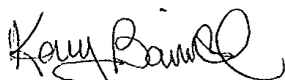
This letter is to officially notify you of the approval of your project by CHC's Institutional Review Board (IRB) for the Protection of Human Subjects. On May 20, 2013, the Community Health Center, Inc. IRB reviewed the research proposal entitled, "Improving Provider Identification and Management of Obesity in Primary Care." The IRB voted to approve the following protocol and your participation as principal investigator (s).

Type of Review: Initial Review**Project Title:** Improving Provider Identification and Management of Obesity in Primary Care
Investigator: Sarah Knoeckel, APRN, MSN**IRB ID:** 1035

This project should be conducted in full accordance with all applicable sections of the IRB Investigator Manual. You should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board. You must also advise the Board when this study is finished or discontinued by completing the enclosed Protocol Final Report Form and returning it to the Institutional Review Board.

If you have any questions, please contact me by email at irb@chc1.com

Sincerely,



Kerry Bamrick

IRB Administrator, Community Health Center Inc.