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Provider Attitudes and Practice Patterns of Obesity Management with Pharmacotherapy

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PROVIDER ATTITUDES AND PRACTICE PATTERNS OF OBESITY
MANAGEMENT WITH PHARMACOTHERAPY

A Thesis Presented

by

Brittany Granara

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements
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ABSTRACT

Background and Purpose: More than one-third of American adults are obese. The prevalence of extreme obesity is rapidly rising. Nine medications are currently approved for weight loss yet they remain under utilized with the focus primarily on lifestyle modifications. The study's objective was to determine current prescribing patterns and attitudes of weight loss medications in the management of obesity among primary care providers (PCPs).

Methods: PCPs were surveyed to determine practice patterns, attitudes, barriers, and facilitators for prescribing weight loss medications.

Conclusions: A total of 105 surveys were completed. 76% of all PCPs did not prescribe weight loss medications for long-term weight loss therapy and 58% of PCPs had negative perceptions of pharmacotherapy as a treatment. Significant differences existed between prescribing patterns and attitudes of advanced practice clinicians and physicians. Safety concerns were identified as the greatest barrier. Having 2+ comorbidities and severe obesity were identified as facilitators for prescribing weight loss medications. Under utilization of pharmacotherapy suggests that PCPs may not have sufficient knowledge about medication safety profiles and efficacy. Delaying treatment until patients have reached a high level of morbidity may be less efficacious than earlier treatment.

Implications for Practice: Education regarding effectiveness and risks of weight loss medications for obesity management is needed and earlier interventions with pharmacotherapy may prevent significant morbidity and mortality.

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CHAPTER I: Introduction

Overview of the Research Problem

The prevalence of obesity in the United States (U.S.) is high. In 2011-2012, more than one-third (35% or 78.6 million) of American adults were obese (Ogden, Carroll, Kit, & Flegal, 2014). Although there have been no significant changes in obesity prevalence since 2003-2004, the number of individuals living with obesity remains at an all-time high. Furthermore, the prevalence of extreme obesity (body mass index [BMI] ≥ 40 kg/m²) increased by 70% between 2000 and 2010 (Sturm & Hattori, 2013). Obesity is a substantial health concern, predisposing individuals to poor health outcomes caused by associated co-morbidities.

Obesity substantially increases the risk of morbidity and mortality due to the wide range of accompanying co-morbidities. According to the Centers for Disease Control (CDC) obesity-related conditions comprise some of the leading causes of preventable death, including cardiovascular disease, stroke, type 2 diabetes, and certain types of cancer (CDC, 2016a). Overall, as BMI rises, the risk of multimorbidity (co-occurrence of multiple long-term diseases) increases in both men and women. The prevalence of multimorbidity in men and women with normal weight is 23% and 28% respectively, rising to 44% in men and 51% in women with extreme obesity (Booth, Prevost, & Gulliford, 2014). A weight loss of 5-10% of total baseline body weight can significantly reduce cardiovascular disease risk factors, including lowering blood pressure and blood cholesterol, as well as preventing or delaying the development of type 2 diabetes (CDC, 2016b).

The direct and indirect costs attributed to obesity in the U.S. are staggering. While direct medical costs may include prevention, diagnostic, and treatment services associated with obesity and obesity-related diseases, indirect medical costs may include premature mortality, higher disability insurance premiums, and productivity loss due to obesity (Hammond & Levine, 2010). According to Finkelstein, Trogon, Cohen, & Dietz (2009), the estimated annual medical cost attributable to obesity in the U.S. was \$147 billion. Overall, the annual medical burden of obesity has risen to almost 10 percent of all medical spending. The medical spending for obese individuals across all payers is nearly 42%, or \$1,429 higher than the spending for individuals who are normal-weight. Similarly in 2006, medical spending for obese beneficiaries cost Medicare over \$600 per beneficiary per year more than normal-weight beneficiaries (Finkelstein et al., 2009).

Despite the concerning obesity epidemic, appropriate and consistent management of obese individuals in primary care settings remains variable (Bleich, Pickett-Blakely, & Cooper, 2011; Shiffman et al., 2009). Current clinical guidelines from the U.S. Preventive Services Task Force recommend that all adult patients be screened for obesity and individuals with BMI $\geq 30\text{kg/m}^2$ should be offered or referred to intensive, multicomponent behavioral interventions (Moyer, 2012). Regardless of these recommendations, several cross-sectional studies have shown that not only are obese individuals not being consistently diagnosed, weight loss counseling by providers is also infrequent, inconsistent, and sub-optimal (Bleich, 2011, Shiffman, 2009; Smith, 2011). When weight loss counseling is incorporated into clinical practice, studies have found that lifestyle interventions are the foundation of primary care provider's (PCP's) counseling. Although pharmacotherapy and bariatric surgery are other available and

effective weight loss interventions, they are often not included or rarely recommended to individuals suffering from obesity (Ferrante, Piasecki, Ohman-Strickland, & Crabtree, 2009; Shiffman, 2009).

Lifestyle interventions alone are not particularly successful in providing long-term weight maintenance due to behavioral and environmental pressures as well as biological mechanisms induced by weight loss (Korner & Aronne, 2003; Rosenbaum, Hirsch, Gallagher, & Leibel, 2008). The addition of pharmacotherapy as an adjunct to traditional diet and exercise approaches has shown to be an effective treatment option for weight loss in obese individuals (Yanovski SZ & Yanovski JA, 2014). When combined with lifestyle interventions, weight loss medications have resulted in 5-10% weight loss (Gadde, 2011, Smith, 2010; Yanovski, 2014). While prior studies have examined factors influencing and barriers preventing weight loss counseling in primary care settings, little research has assessed PCPs' practice patterns and attitudes around the use of weight loss medications. There is lack of current research examining the underlying reasons for limited pharmacotherapy use in weight loss counseling, despite its demonstrated efficacy.

Purpose of the Study

The purpose of this study was to examine prescribing patterns of currently available, Food and Drug Administration (FDA) approved weight loss medications among PCPs. A self-reported survey was used to evaluate prescribers' current practice patterns and attitudes around their use of weight loss medications in obesity management.

Theoretical Framework

The theoretical framework that guided this study was the Theory of Reasoned Action (TRA) (Fishbein & Ajzen, 1975). The theory was developed in the late 1960s and

later modified to the Theory of Planned Behavior. The relationship between beliefs, attitudes, intentions, and behavior are explained by the TRA. Under this theory, it is assumed that people are rational and make decisions based on available information. The theory posits that behavior is predicted by the individual's intention to perform the behavior. In regards to the Theory of Planned Behavior, intention is the most important element of a person's behavior. Intention is the individual's readiness to perform a behavior as determined by their attitude toward the behavior, subjective norms, and perceived control of the behavior.

An individual's attitude is formed based on their overall evaluation of performing the behavior and their beliefs about the behavior's consequences. Attitude encompasses knowledge, feelings, beliefs, intentions, and perceptions. Conversely, subjective norms are the social pressures applied to an individual to perform or not perform a behavior. These pressures may influence the decision to perform a behavior by an inherent desire to conform to other's opinions and to behave as others expect them to behave. Finally, perceived behavioral control is the perceived power an individual has over performing the behavior. Perceived control is influenced by the individual's attitude and subjective norms. Typically, the individual's perceived control and thus intent to perform the behavior will be greater if the attitude and subjective norm are positive.

The Theory of Reasoned Action helps explain providers' behavior toward the use of weight loss medications for obese individuals. This study encompasses the components of this theory by assuming that providers' intent to perform a behavior is based on their beliefs, attitudes, subjective norms, and perceived control. The TRA is

useful in determining the factors that predict a provider's intentions to include pharmacotherapy in obesity care.

Aims/Objective

The objective of the current study was to determine current prescribing patterns and attitudes of weight loss medications in the management of obesity among PCPs. The study had three aims including, 1.) To determine why PCPs are or are not including weight loss medications in weight loss counseling, 2.) To determine what barriers exist around the use of weight loss medications in obesity management, and 3.) To determine under what circumstances PCPs are prescribing weight loss medications for obesity.

Nurse Practitioner Core Competencies

Nurse practitioners can play a significant role in producing positive health outcomes for obese patients. As licensed independent practitioners, advanced practice nurses provide leadership in the translation of new knowledge into practice (Thomas et al., 2012). By seeking to better understand practice patterns and barriers regarding the use of effective treatment options for the management of obesity, nurse practitioners can implement the gained knowledge to provide improved and well-informed care to obese patients. Furthermore, nurse practitioners are responsible as health care providers to integrate ethical principles into their clinical decision-making (Thomas et al., 2012). Thus, they are ethically accountable for recognizing and informing obese patients of all available and effective treatment options. Nurse practitioners are in a position to be leaders in transforming health care delivery and providing high quality care to patients with complex conditions. Through this study, nurse practitioner core competencies were

achieved by integrating new knowledge into the care of adults living with obesity and its associated co-morbidities.

Significance

Understanding practice patterns, barriers, and PCP attitudes regarding the use of weight loss medications for obesity management can identify knowledge gaps and inform appropriate interventions for PCP education and training. Enhancing PCP skill and knowledge around effective adjunct treatment options for obesity care may result in more frequent pharmacotherapy use and thus greater long-term weight-loss maintenance and improved patient outcomes. Additionally, the information gained from this study may be helpful in the development and implementation of obesity treatment guidelines as they expand to include more than traditional lifestyle and behavioral approaches to weight loss.

CHAPTER II: Comprehensive Literature Review

This chapter presents the available research related to current obesity management practices, including the efficacy and use of available weight loss interventions.

Interventions currently included in weight loss counseling and efficacy

Available weight loss interventions include lifestyle modifications, pharmacological approaches, and surgical options. Currently, lifestyle modifications incorporating diet and physical activity remain the foundation of weight loss counseling in primary care settings for patients who are overweight and obese.

Bleich et al. (2011) analyzed cross-sectional clinical encounter data from physician office visits to identify whether obese patients received weight-related counseling from their physician. Data on obese adults (n=2458) was obtained from the National Ambulatory Medical Care Survey (NAMCS). Researchers found that a third of the obese study sample received an obesity diagnosis, 17.6% received weight reduction counseling, 20.5% received exercise counseling, and 25.2% received diet counseling. Counseling about other weight loss interventions including obesity medication and surgery was not studied. Likewise, Shiffman et al. (2009) conducted a cross-sectional study evaluating what weight management interventions American adult patients (n=3500) reported receiving from physicians. Data was collected through a random-digit dialed telephone survey in 2005-2006. At the time of the study, 41.6% of respondents were normal weight, 35.9% overweight, and 22.5% obese, according to BMI. Respondents were asked a series of questions regarding the types of weight management interventions physicians had ever recommended to them. Ten recommended interventions were listed including being told about health problems associated with being overweight,

changing their diet, suggesting diet and exercise, stating diet and exercise are the only way to lose weight, prescribing weight loss medication, recommending over the counter weight loss products, suggesting bariatric surgery, providing reading material about weight loss, referral to dietitian/nutritionist, and suggesting a formal diet program. Twenty-eight percent of respondents (14.1% of obese respondents) denied ever being offered any of the listed interventions. The interventions most frequently reported included having a physician tell them about health problems associated with being overweight (48%) and suggesting diet and exercise (46.5%). Overall, only 4.0% of respondents (9.8% of obese respondents) reported receiving a prescription for weight loss medication. Bariatric surgery was recommended in 1.5% of participants. Both studies were limited by their cross-sectional nature. Additionally, reports of weight loss counseling were subjective and thus recall bias may have influenced study results by under or over-estimating weight-related counseling.

While lifestyle modifications are recommended most frequently, diet and exercise have not proven to be effective for long-term weight loss success. Although many individuals are able to lose weight with diet, many go on to regain all or a majority of the weight lost (MacLean, Bergouignan, Cornier, & Jackman, 2011). Aside from behavioral and environmental factors, neurohormonal mechanisms have been identified as promoters of weight regain after weight loss caused by dietary restriction. In addition to reduced energy expenditure, restricting calories results in compensatory changes in the peripheral hormonal pathways including decreased levels of anorexogenic hormones, and increased levels of ghrelin leading to increased appetite (Rosenbaum, Hirsch, Gallagher, & Leibel, 2008). The combination of decreased energy expenditure and changes in neurohormonal

status leads to increased food intake, restoration of fat cell mass, and thus weight regain (Korner & Aronne, 2003).

Physical activity alone produces only modest reduction in body weight. Donnelly, Jacobsen, Heelan, Seip, & Smith (2000) studied the effects of continuous versus intermittent exercise on body weight and composition for 18 months in moderately obese females (n=22) who were previously sedentary. The continuous exercise group exercised 3 times per week for 30 minutes at 60-75% of maximal aerobic capacity. The intermittent group walked briskly twice per day for 15 minutes each, 5 days per week. Overall, weight loss was minimal in both weight groups. Participants in the continuous group experienced a 2.1% decrease in weight from baseline compared to a 1.0% decrease in the intermittent group. Due to the small sample size and sample limitation to women only with moderate obesity, the study may not be generalizable to other populations. The amount of weight loss seen in this study is comparable to a recent meta-analysis by Thorogood et al. (2011) that evaluated the effect of isolated aerobic exercise programs on weight loss in overweight and obese populations. In 14 randomized controlled trials involving 1847 total subjects, researchers found that moderate-intensity aerobic exercise programs of 6-12 months induced only a modest reduction in weight, averaging a weighted mean difference of -1.6kg of weight loss for 6-month programs and -1.7 kg for 12-month programs. The results of the meta-analysis were limited by the lack of homogeneity between the included studies. Differences in study populations and exercise interventions may have provided inconsistent data, which could have altered the overall weight reduction seen in the pooled analysis.

Frequently recommended lifestyle modifications used in weight loss counseling have shown only modest results. While exercise alone may not be an appropriate intervention for significant weight reduction, dietary restriction often leads to weight regain due to changes in energy expenditure and hormonal signals induced by weight loss.

Weight loss counseling

Although assessment and management of obesity is indicated according to clinical guidelines, many health care providers are not consistently recommending weight loss interventions to all overweight and obese patients. Several studies have identified that obesity care, including diagnosis varies depending on patient characteristics.

In the 2011 study by Bleich et al., a secondary aim was to identify physician, sociodemographic, and clinical encounter characteristics associated with patients' reception of an obesity diagnosis and weight-related counseling. Researchers found that women, young adults aged 18-29, and severely/morbidly obese individuals were significantly more likely to receive an obesity diagnosis. Individuals receiving an obesity diagnosis were nearly 6 times more likely to receive weight-reduction counseling, nearly 3 times more likely to receive diet counseling, and 2.5 times more likely to receive exercise counseling when compared to those without a formal obesity diagnosis. Additional predictors of weight-loss counseling included seeing a cardiologist/other internal medicine specialist, having a preventive visit, or more time spent with the physician.

Dutton and colleagues (2014) examined the association between patient characteristics, physician characteristics, and the physician-patient relationship and the

likelihood of weight loss counseling by primary care physicians. The cross-sectional study collected data through a self-reported survey of primary care patients (n = 143) with obesity (mean BMI: 36.9kg/m²). Researchers found that a higher BMI (>35kg/m²), more medical conditions, and having a female physician were associated with receiving more frequent weight loss counseling. Frequency of physician visits and duration of physician-patient relationship were not associated with the amount of weight loss counseling received. Similarly, Simkin-Silverman et al. (2005) retrospectively examined data from the Primary Care Weight Control Project to identify predictors of obesity identification and weight control advice. Body mass index was a strong predictor of receiving an obesity diagnosis. Factors associated with receiving weight control advice included a history of type 2 diabetes, hypertension, high cholesterol, and arthritis, patients' readiness to change (preparation/action/maintenance), and number of past visits. Body mass index and waist circumference were significant univariate predictors of weight control advice, but no longer significant in multivariable models most likely attributed to the variance associated with diabetes and other risk factors.

In summary, the literature regarding patient characteristics and predictors for weight related counseling is inconsistent. Patient BMI, obesity co-morbidities, and frequency of visits/time spent with the health care provider appear to be factors associated with receipt of weight loss counseling in primary care settings. Understanding predictors for weight management may influence intervention choice when providing obesity care and management.

Barriers to weight loss counseling

Several barriers have been identified in the literature regarding weight loss counseling in primary care settings. Conversely, there was limited research examining specific barriers related to prescribing weight loss medications. As both counseling and prescribing pertain to obesity management, several barriers may in fact overlap.

Gunther, Guo, Sinfield, Rogers, and Baker (2012) conducted interviews with general practitioners, practice nurses, and overweight or obese patients to explore barriers for implementing specific guidelines in the management of adult obesity in general practice. Health care provider barriers identified included a reluctance to take responsibility for implementing obesity guidelines, lack of consistency in weight management approaches across practices, lack of counseling skills, limited time with patients, perceived lack of available services (psychological/nutritional), and restraints imposed by commissioners of health. Huang et al. (2004) discussed barriers identified by physicians in focus groups. Physician pessimism about patient's desire and ability to lose weight, pessimism about the effectiveness of weight loss counseling, lack of comprehensive obesity management resources, insufficient time due to high patient volume, underuse of dieticians or lack of experience working with dieticians, lack of skill in providing brief counseling, and insufficient knowledge of best clinical practices were recognized. The study found a significant barrier was physicians' feelings of being inadequately prepared to provide diet, exercise, and weight loss counseling. This suggests that health care providers may have insufficient confidence, resources, and/or a lack of knowledge regarding when medications might be indicated as well as their beneficial effects.

Forman-Hoffman, Little, and Wahls (2006) identified barriers to effectively managing obesity in the Veteran's Health Administration (VHA) primary care settings. The most strongly related barrier to providing diet and exercise counseling was poor obesity education during medical school and residency training. A lack of information provided by the VHA to primary care clinicians and their patients regarding available services for weight management was also perceived as a significant barrier. Additionally, health care clinician attitudes may also be a barrier to weight loss counseling. For example, the researchers also looked at whether clinicians counsel obese patients in a positive or negative context. They found that clinicians who believe obesity is a disease are more likely to counsel in a positive context compared to those who do not believe it is a disease. Perceived barriers in the VHA may differ from other health care settings due to differing policies, insurance coverage, and patient population. However, the study findings provide insight that negative attitudes impact weight loss counseling and might therefore influence intervention choice, including prescribing anti-obesity medication.

In summary, a wide range of barriers to weight loss counseling exists. Lack of appropriate training, skills, and available resources was consistently demonstrated across the literature. Barriers were associated with weight loss counseling as it pertained to diet and exercise, and did not specifically include barriers around the use of pharmacologic treatment options.

Available weight loss medications, efficacy, & safety

Nine medications are currently Food and Drug Administration (FDA) approved for weight loss in the management of obesity. These agents are used as adjunct therapy to lifestyle interventions and are typically reserved for individuals unable to lose weight

with diet and physical activity alone and for those at greater health risk due to co-morbid complications associated with obesity.

Pharmacotherapies approved for long-term therapy are classified based on their targeted location of action. Centrally acting agents include lorcaserin (Belviq™), phentermine/topiramate (Qsymia™), and bupropion/naltrexone (Contrave™, Mysimba™). Peripherally acting agents include orlistat (Xenical™) and liraglutide (Saxenda™). Four centrally acting amphetamine derivatives are also available for short-term use (≤ 12 weeks) including phentermine, benzphetamine, phendimetrazine, and diethylpropion. Differences between mechanisms of action exist between agents. However, anti-obesity medications may interfere with the physiological mechanisms induced by lifestyle interventions that promote weight gain and challenge long-term maintenance. All agents produce their effects by reducing food intake or nutrient absorption and/or increasing resting or activity-related energy expenditure (Jones & Bloom, 2015).

Overall, anti-obesity medications have shown higher efficacy in producing weight loss than lifestyle interventions alone. A review by Yanovski and Yanovski (2014) found that long-term obesity medications produced significant weight loss when used in combination with lifestyle modifications such as diet and exercise. Compared to placebo, additional weight loss at 1 year ranged from approximately 3% of baseline weight with orlistat and lorcaserin, to 9% with high-dose phentermine/topiramate extended release (ER). Several randomized controlled trials looking at anti-obesity drugs compared to standard care have resulted in 5-10% weight loss when combined with lifestyle interventions. For example, Gadde et al. (2011) assessed the efficacy of two doses of

combined phentermine plus topiramate ER as an adjunct to diet and lifestyle modification for weight loss in obese subjects (n=2487). Both doses resulted in greater efficacy compared to placebo (lifestyle intervention alone). At least 5% weight loss was achieved in only 21% of the placebo group compared to 62% of patients prescribed phentermine 7.5mg plus topiramate 46.0mg and 70% prescribed phentermine 15.0mg plus topiramate 92.0mg. Correspondingly, 7%, 37%, and 48% achieved $\geq 10\%$ weight loss with the same interventions. All groups received standardized counseling for diet and lifestyle modification. The study was limited by its generalizability due to restriction of BMI (45 kg/m²) and lack of ethnic (86% white) and gender (70% female) diversity.

As with all medications, anti-obesity agents can be accompanied by adverse events. Several of the agents recently approved for long-term use (since 2012) have been prescribed independently under other indications for many years and thus adverse side effects have been well established. These medications include bupropion, naltrexone, phentermine, topiramate, and liraglutide. In addition to studying efficacy, multiple randomized controlled trials have included assessment of drug safety profiles. For example, Smith et al. (2010) evaluated safety of lorcaserin as an outcome variable for weight loss and maintenance, including rates of valvulopathy development. The rate of cardiac valvulopathy was not increased among 2472 patients evaluated at year one and 1127 patients evaluated at year two. Its selective nature of serotonin 2C receptors is not generally associated with the valvulopathy previously seen with serotonin 2B receptors, although long-term data is not yet established.

In summary, several randomized controlled trials have analyzed both safety and efficacy of weight loss medications. They concluded that prescribing should be individualized and based on a balance between risk and benefit profiles.

Current practice patterns around weight loss medication use

Few published studies that have examined weight loss counseling include the use of weight loss medications. Ferrante, Piasecki, Ohman-Strickland, and Crabtree (2012) studied family physicians' practice patterns and attitudes regarding extremely obese patients and associating factors, including physician knowledge and demographic characteristics. Practicing family physicians (n =255) in New Jersey completed self-administered surveys inquiring about knowledge regarding care of extremely obese patients, weight management approaches, attitudes toward managing obesity, challenges with physical examinations, availability of supplies, and strategies to improve care. The most frequently recommended interventions included basic good nutrition/adding fruits and vegetables (81.4% of physicians almost always recommended) and regular exercise (79.2% of physicians almost always recommended). Conversely, 46.4% of respondents reported almost never recommending weight loss drugs. Higher self-reported knowledge about weight loss drugs was associated with more frequent weight loss drug recommendations. Physicians with more than 7% of extremely obese patients in practice were less likely to recommend weight loss medications compared to those with less than 7% of extremely obese patients. The self-reported nature of the study may have biased results by over or underestimating practice patterns. Response bias may have also impacted study findings, as responders may have been more interested in obesity than those not responding; thus the results may not represent the general population.

Glauser et al. (2015) explored the knowledge and practice patterns of primary care physicians (PCPs), endocrinologists (ENDOs), cardiologists (CARDs) and bariatricians (BARIs) regarding obesity screening and management. A random-sample of 300 United States-based practicing physicians completed case vignette surveys tailored to their specialty. Self-reported demographic and practice information was also collected. On average one-third of PCPs and CARDs' patients were obese compared with 46% for ENDOs and 75% for BARIs. Based on a case vignette presented to participants describing an obese patient with multiple comorbidities and risk factors, $BMI \geq 30 \text{kg/m}^2$ was the most selected indication for weight loss medication across all physician groups. Expectations regarding the percentage of expected weight loss for a given case were inconsistent. A considerable amount of physicians selected a 15% expected weight loss (PCPs 32%, ENDOs 21%, CARDs 36%) with a serotonin 2c receptor agonist, which is 10% more than what has been demonstrated in the literature. All groups of physicians did not perceive the available weight loss medications to be safe or effective. The cases were not inclusive of all patient demographics, comorbidities, medical and personal histories of which the physician may encounter in clinical practice and therefore may have altered responses and study results. However, this suggests that physicians may lack the necessary knowledge to effectively utilize weight loss agents in clinical practice.

In summary, studies that look at practice patterns related to pharmacological interventions are limited. Within the available studies, the underlying influences around prescribing weight loss medications have not been fully examined. Additionally, the literature has focused primarily on physician prescribers and has not evaluated

prescribing practices among other prescribers including physician assistants and nurse practitioners.

Summary

Weight loss interventions include lifestyle modifications, pharmacotherapy, and surgery. Currently, counseling in primary care settings is largely focused on lifestyle modifications. Although a combination of diet and exercise may be an effective intervention for initial weight loss, weight regain is prevalent and to some extent, a function of internal homeostatic changes that stimulate appetite. While the majority of studies have found that when health care providers do provide weight loss counseling to obese patients, pharmacological approaches are rarely included with their typical recommendations of diet and exercise. Five FDA approved weight loss medications have demonstrated to be effective approaches to overcoming long-term challenges with weight loss maintenance in obese individuals. While safety profiles of weight loss medications have been a significant concern in the past, several of the new medications approved have been used for many years under alternative indications and without serious adverse events.

Current practice patterns around the use of weight loss counseling, including patient characteristics associated with the initiation of counseling and barriers preventing consistent counseling were examined in the literature review. While many of these factors may be similar, limited research is available regarding the prescribing patterns of anti-obesity medications. Four new agents have been FDA approved for long-term use since 2012. With the high prevalence of obesity in America, it is essential that providers are aware of all effective interventions for obesity management. Understanding provider

practices and barriers around the use of these anti-obesity agents may provide insight regarding why an effective addition to traditional lifestyle management is not frequently recommended.

Provider Attitudes and Practice Patterns of Obesity Management with Pharmacotherapy

Abstract

Background and Purpose: More than one-third of American adults are obese. The prevalence of extreme obesity is rapidly rising. Nine medications are currently approved for weight loss yet they remain under utilized with the focus primarily on lifestyle modifications. The study's objective was to determine current prescribing patterns and attitudes of weight loss medications in the management of obesity among primary care providers (PCPs).

Methods: PCPs were surveyed to determine practice patterns, attitudes, barriers, and facilitators for prescribing weight loss medications.

Conclusions: A total of 105 surveys were completed. 76% of all PCPs did not prescribe weight loss medications for long-term weight loss therapy and 58% of PCPs had negative perceptions of pharmacotherapy as a treatment. Significant differences existed between prescribing patterns and attitudes of advanced practice clinicians and physicians. Safety concerns were identified as the greatest barrier. Having 2+ comorbidities and severe obesity were identified as facilitators for prescribing weight loss medications. Under utilization of pharmacotherapy suggests that PCPs may not have sufficient knowledge about medication safety profiles and efficacy. Delaying treatment until patients have reached a high level of morbidity may be less efficacious than earlier treatment.

Implications for Practice: Education regarding effectiveness and risks of weight loss medications for obesity management is needed and earlier interventions with pharmacotherapy may prevent significant morbidity and mortality.

Introduction

The prevalence of obesity in the United States (U.S.) is high. In 2011-2012, 35%, or 78.6 million American adults were obese (Ogden, Carroll, Kit, & Flegal, 2014). Although there have been no significant changes in obesity prevalence since 2003-2004, those living with obesity remains at an all-time high. Alarming, the prevalence of extreme obesity (body mass index [BMI] ≥ 40 kg/m²) increased by 70% between 2000 and 2010 (Sturm & Hattori, 2013).

The direct and indirect costs attributed to obesity in the U.S. are staggering. While direct medical costs may include prevention, diagnostic, and treatment services associated with obesity and obesity-related diseases, indirect medical costs may include premature mortality, higher disability insurance premiums, and productivity loss due to obesity (Hammond & Levine, 2010). According to Finkelstein, Trogon, Cohen, & Dietz (2009), the estimated annual medical cost attributable to obesity in the U.S. was \$147 billion. Overall, the annual medical burden of obesity has risen to almost 10 percent of all medical spending (Finkelstein et al., 2009).

Obesity is a significant health concern. The disease substantially increases the risk of morbidity and mortality due to the wide range of associated co-morbidities. According to the Centers for Disease Control (CDC), obesity-related conditions comprise some of the leading causes of preventable death, including cardiovascular disease, stroke, type 2 diabetes, and certain types of cancer (CDC, 2016a). Overall, as BMI rises, the risk of multi-morbidity (co-occurrence of multiple long-term diseases) increases in both men and women. The prevalence of multi-morbidity in men and women with normal weight is 23% and 28% respectively, rising to 44% in men and 51% in women with extreme

obesity (Booth, Prevost, & Gulliford, 2014). Weight loss of 5-10% of total baseline body weight has been shown to decrease cardiovascular disease risk factors, including lowering blood pressure and blood cholesterol, as well as preventing or delaying the development of type 2 diabetes by reducing blood sugars (CDC, 2016b).

Despite the concerning obesity epidemic, appropriate and consistent management of obese individuals in primary care settings remains varied (Bleich, 2011; Shiffman, 2009). Current clinical guidelines from the U.S. Preventive Services Task Force recommend that all adult patients be screened for obesity and individuals with BMI $\geq 30\text{kg/m}^2$ should be offered or referred to intensive, multicomponent behavioral interventions (Moyer, 2012). Regardless of these recommendations, several cross-sectional studies have shown that not only are obese individuals not being consistently diagnosed, weight loss counseling by primary care providers (PCPs) is also infrequent, inconsistent, and sub-optimal (Bleich, 2011, Shiffman, 2009; Smith 2011). When weight loss counseling is incorporated into clinical practice, studies have found that lifestyle interventions are the foundation of PCP's recommendations. Although pharmacotherapy and bariatric surgery are available and effective weight loss interventions, they are often not included or rarely recommended to individuals with obesity (Ferrante, 2012; Shiffman, 2009).

Lifestyle interventions alone are not particularly successful in providing long-term weight maintenance due to behavioral and environmental pressures as well as biological mechanisms induced by weight loss (Korner, 2003; Rosenbaum, 2008). Although many individuals are able to lose weight initially with diet and exercise, more than one-third of weight lost is regained within year one (MacLean, Bergouignan,

Cornier, & Jackman, 2011). The U.S. Food and Drug Administration (FDA) have currently approved five medications for long-term weight loss therapy. The addition of pharmacotherapy as an adjunct to traditional lifestyle approaches has shown to be an effective treatment option for weight loss in obese individuals (Khera, 2016; Yanovski, 2014). When combined with lifestyle interventions, weight loss medications have resulted in clinically significant weight loss of 5-10% (Gadde, 2011, Khera, 2016, Smith 2010; Yanovski, 2014).

Obesity management and weight loss counseling generally begin in the primary care setting. While prior studies have examined factors influencing and barriers preventing weight loss counseling in primary care, little research has assessed PCP's practice patterns and attitudes around the use of weight loss medications. There is lack of current research examining the underlying reasons for limited pharmacotherapy use in weight loss counseling, despite its demonstrated efficacy. Our objective was to determine current prescribing patterns and attitudes of weight loss medications in the management of obesity among PCPs. Our aims included 1.) To determine why PCPs are or are not including weight loss medications in weight loss counseling, 2.) To determine what barriers exist around the use of weight loss medications in obesity management, and 3.) To determine under what circumstances PCPs are prescribing weight loss medications for obesity.

Study design and methods

This study was reviewed and approved by the Internal Review Board prior to study procedures. Inclusion criteria consisted of the ability to read and write in English, self-identified as a PCP, and provided health care for individuals who are ≥ 18 years of

age. Exclusion criteria included PCPs who provided patient care in specialty practices that included bariatric health, endocrinology, and/or cardiology.

Data collection

A convenience sample of primary care nurse practitioners (NPs), physician assistants (PAs), and physicians (MDs) were recruited using online list-serves from regional professional organizations and on-site at one organization's annual conference in Northeastern, U.S. Potential participants during on-site data collection received a hard copy invitation and survey and potential online participants received an electronic invitation and survey. Participants' completion of the distributed survey served as passive informed consent. Data was entered into LimeSurvey statistical software (version 2.55).

Survey development

The study survey was formulated and adapted based on a review of the literature reflecting current obesity management and barriers and facilitators for weight loss counseling. Two content experts reviewed the survey to ensure clarity and content validity. The survey contained 24 questions in which PCPs were asked to express their impressions and use of obesity pharmacotherapy (Appendix B). Demographic data including ethnicity, type of PCP (i.e. nurse practitioner, physician, or physician assistant), years in practice, primary specialty, patient population, and location of clinical practice were collected.

Analysis

PCP demographics were summarized using descriptive statistics and frequency tables. Inferential statistics were computed to assess attitudes and practice patterns around the use of weight loss medications. Pearson chi-square tests were computed to determine

between group (physician vs. advanced practice clinician) differences in demographics, attitudes, and practice patterns. McNemar tests were used to compare the recommended use of each weight loss medication to its effectiveness. Open ended-questions were transcribed using categorical data. For all analyses, a *P*-value of <0.05, two-sided, was established as statistically significant. SPSS v. 23 was used for data analysis (IBM Corp, 2015).

Results

The survey reached approximately 964 PCPs. Of the nearly 964 PCPs approached, 105 PCPs completed the survey, resulting in a response rate of approximately 11%. Eleven of the respondents did not meet the study inclusion criteria, resulting in a final n=94. The 94 respondents were self-identified as PCPs who worked primarily in family practice, internal medicine, adult primary care, and women's health. The demographic and practice characteristics of the respondents are summarized in Table 1. Of the 94 respondents, 46 were MDs, 43 were NPs, and 5 were PAs. Due to the low response rate of PAs, responses from NPs and PAs were combined to a single provider group identified as advanced practice clinicians (APCs) (n=48).

Provider practice patterns around the use of weight loss medications for obesity management

Overall, 60% of the PCPs surveyed reported not prescribing weight loss medications for short-term weight loss therapy (<3 months). When grouped by provider type, APCs (46%) were prescribing weight loss medication more frequently than MDs (33%). 76% of PCPs reported not prescribing weight loss medications for long-term therapy (≥ 3 months). Prescribing patterns were not statistically different between

provider groups for long-term therapy. Recommended medications are outlined in Table 2 in order based on frequency of prescribing.

Provider attitudes of weight loss medications as a treatment for obesity

58% of all PCPs reported “negative” and “very negative” impressions of pharmacotherapy as a treatment for obesity. 58% of APCs had a “neutral” to “very positive” impression of weight loss medications compared to 20% of MDs ($P=0.002$). 75% of MDs had a negative impression. 4% of all PCPs felt weight loss medications were safe. 52% of PCPs reported that some medications were safe and others were not safe. 73% of APCs expected a >5% weight loss with the use of pharmacotherapy as an adjunct to lifestyle interventions compared to 50% of MDs ($P=0.044$). Weight loss medications perceived as effective are outlined in Table 2. While 40% of PCPs reported recommending orlistat, only 19% of PCPs reported orlistat as being effective for weight loss (Figure 1).

Perceived barriers to the use of weight loss medications

The most frequently reported factors preventing PCPs from prescribing weight loss medications included fear of adverse events followed by fear of medication interactions (Table 3). Cost and insurance coverage and lack of perceived effectiveness were third. Lack of time was the least important barrier to prescribing. 60% of PCPs reported that concern of medication adverse events was a barrier to prescribing weight loss medications. 49% of PCPs reported that they would still not prescribe weight loss medications even if cost and insurance coverage were not significant barriers. There was a significant difference in responses between PCP types. 67% of APCs reported they would prescribe if cost/insurance were not barriers, compared to 34% of MDs ($P = 0.02$).

Perceived facilitators to the use of weight loss medications

The most frequently reported circumstance for recommending weight loss medication was if patients had 2+ comorbidities associated with obesity. The second most frequently reported circumstance was if patients had severe obesity (BMI ≥ 40 kg/m²) (Table 4). Failure to achieve goal weight with lifestyle interventions was third. Mild obesity (BMI 30-34.9 kg/m²) was identified as the least important factor for prescribing.

Discussion

Regardless of the high prevalence of obesity in the U.S. and its wide range of associated co-morbidities, the PCPs in our study were hesitant to prescribe weight loss medications, particularly for long-term therapy. In general, over half of the PCPs had an overall unfavorable impression of pharmacotherapy as a treatment option for obesity, with MDs having a more negative impression than APCs. This, in addition to safety concerns and cost/insurance factors may explain why prescribing is low among all PCP types.

Safety concerns were the most important barriers preventing PCPs from prescribing weight loss medications. Although long-term safety data has not been established for the combined agents approved for weight loss therapy, several drugs have been prescribed independently for many years; thus adverse side effects have been well established. Randomized controlled trials have examined drug efficacy and safety profiles. Reported common adverse side effects included gastrointestinal upset, neurological complaints (i.e. headache, dizziness, tremor; paresthesias), hypoglycemia, and elevated heart rate (Yanovski, 2014; Khera, 2016). Serious adverse events were

infrequently reported, comparable to placebo, varied depending on drug type, and included conditions such as cholelithiasis, cholecystitis, pancreatitis, severe hypoglycemia, and valvulopathy (Khera et al., 2016). Though long-term trials have not been established, cardiac valvulopathy is generally associated with serotonin 2B receptor medications as opposed to the more selective serotonin 2C receptor medications recently approved (Smith et al., 2010). While weight loss medications may impose risk, obesity is associated with significantly higher all-cause mortality relative to normal weight (Flegal, Kit, Orpana, & Graubard, 2013). Thus, adverse effects of medications should be weighed against the benefits seen with weight loss medications. The PCPs' concerns about safety in the current study support previous research findings where physicians did not perceive available weight loss medications to be safe or effective (Glauser et al., 2015). This suggests that PCPs may not have sufficient knowledge regarding the safety profiles of available medication options. Education of PCPs regarding the drugs' pharmacodynamics as well as risks for adverse side effects may facilitate increased confidence for prescribing, thus improving weight loss in obese patients.

Our results demonstrated that PCPs were more likely to prescribe weight loss medications to patients who were severely obese than to patients who were moderately or mildly obese. This is contrary to previous research, which found that physicians who cared for >7% extremely obese patients were less likely to recommend weight loss medications compared to those who cared for <7% extremely obese patients (Ferrante et al., 2009). Conversely, although not specific to pharmacotherapy, our findings were consistent with previous studies that have reported BMI as a key factor in providing weight loss counseling to patients. Bleich et al. (2011) found that severely/morbidly

obese individuals were significantly more likely to receive an obesity diagnosis and therefore were nearly 6 times more likely to receive weight-reduction counseling than those who did not receive a diagnosis. Dutton et al. (2014) also found that a higher BMI ($>35 \text{ kg/m}^2$) was associated with receiving more frequent weight loss counseling.

According to our findings, it was evident that the degree of obesity was a pertinent factor for prescribing medication. There was a direct relationship between weight severity and increased prescribing. Obese patients who are not classified as severely obese may not be receiving recommendations from their PCPs about all available and effective treatment options, including pharmacotherapy. Further education of PCPs regarding when to initiate conversations with patients about weight loss pharmacotherapy, to include all levels of obesity, may lead to earlier interventions and prevention of worsening obesity and co-morbid disease.

A modest 5-10% weight reduction has been shown to improve lipids, decrease blood pressure, and reduce HbA_{1c} in patients with obesity (Wing et al., 2011). A systematic review showed that weight loss medications produced greater improvements in cardiometabolic risk factors than behavioral interventions alone (Yanovski & Yanovski, 2014). Other studies have shown that weight loss medications resulted in a more pronounced improvement in blood pressure, lipids, and glycemic control when used for patients with pre-existing co-morbid disease (Gadde, 2011). Weight loss medications are approved for patients with a BMI of $\geq 30 \text{ kg/m}^2$ or a BMI $\geq 27 \text{ kg/m}^2$ with one or more co-morbidity in conjunction with a reduced-calorie diet and increased physical activity. The present study found that the most important facilitator for prescribing weight loss medications was patients' having two or more associated co-morbidities.

These findings suggest that PCPs may be intervening too late, when patients have reached the “severely obese” category and have already developed multiple comorbidities. Recommending and prescribing weight loss medications earlier in the disease process may be a more proactive approach to preventing the long-term sequelae of obesity.

Despite the overall low prescribing patterns for both short-term and long-term weight loss therapy among all PCPs, APCs prescribed medication more frequently than MDs and were significantly more likely to prescribe medication when cost and insurance coverage were not pertinent factors. APCs also had a significantly more positive impression of pharmacotherapy as a treatment for obesity and higher expectations for weight loss than MDs. This suggests that PCPs with a higher expectation for weight loss and more positive impression may be more likely to prescribe weight loss medications for obesity. Previous research has shown that physicians’ higher self-reported knowledge regarding weight loss medications was associated with fewer negative attitudes and more frequent recommendations of pharmacotherapy options (Ferrante et al., 2009). With the majority of the APC group being NPs, our findings may be attributable to the philosophical lens of the nursing discipline. NPs traditionally take a holistic approach to patient-centered, context-based, diagnostic reasoning and care planning that is in line with nursing theory and philosophy (Burman, Stepan, Jansa, & Steiner, 2002). Implementing a holistic approach that is patient-centered and highly individualized can be key to producing positive outcomes for patients with obesity.

We found that PCPs continue to be reluctant to recommend weight loss medications, despite their shown efficacy. Overall, anti-obesity medications have shown

higher efficacy in producing weight loss than lifestyle interventions alone. A review by Yanovski and Yanovski (2014) found that long-term obesity medications produced significant weight loss when used in combination with lifestyle modifications such as diet and exercise. Compared to placebo, additional weight loss at 1 year ranged from approximately 3% of baseline weight to 9%. Similarly a systematic review by Khera et al. (2016), found that all five medications approved for long-term weight loss therapy achieved at least 5% weight loss at 52 weeks, a significant improvement in weight maintenance.

Obesity management is multifactorial. Our study results suggest that obesity management for many patients does not extend past behavioral counseling and recommendations for diet and exercise. PCPs may not be appropriately educating their patients about the full spectrum of available and effective treatment options for obesity management. This may be due to low perceived effectiveness, safety concerns, and specific patient characteristics required. When considering the Chronic Care Model (Bodenheimer, Wagner, & Grumbach, 2002), patients cannot be fully informed and engaged members in the decision-making process if they do not have fully informed and engaged PCPs. This study demonstrates the need for increased educational programs for PCPs regarding the indications, effectiveness, and potential risks associated with the use of weight loss medications. Continuing education may enhance PCP knowledge about weight loss medications and improve PCPs' ability to have informed conversations with patients and engage their patients in the decision-making process. Both PCPs and patients need accurate information about treatment options to collaboratively weigh the risks with the benefits. Additionally, earlier interventions with pharmacotherapy may prevent

morbidity and mortality associated with obesity and its co-morbidities. Differences exist in prescribing patterns between PCP types. Further research may be needed to better understand these differences in PCP attitudes and prescribing patterns.

Limitations

The current study is primarily limited by the small sample size and low response rate. Identifying list-serve numbers can be inexact; thus an exact response rate could not be determined. Causal inferences could not be identified. PAs were not well represented in the study. Future studies should examine the effect that educational programs, focused on weight loss pharmacotherapy, have on PCP prescribing patterns.

Conclusion

This study demonstrates the need for supplementary educational programs to cultivate informed PCPs about the safe and effective use of weight loss medications as a component to obesity management. Educated PCPs can better inform and engage patients in shared decision-making with regards to obesity management. The overarching goal of PCPs is to reduce poor health outcomes and improve quality of life. Earlier use of pharmacotherapy in combination with lifestyle modifications may reduce the costly morbidity and mortality associated with obesity.

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Table 1: PCP demographic characteristics

Characteristic:	Respondents n (%):
Profession:	
Nurse practitioner	43 (46)
Physician Assistant	5 (5)
Physician	46 (49)
Primary specialty:	
Family Practice/Family Medicine	52 (56)
Internal Medicine	21 (23)
Adult Primary Care	11 (12)
Women's Health	3 (3)
Other	6 (7)
Years in practice:	
0-10	35 (37)
11-20	27 (29)
≥20	32 (34)
Practice type:	
Solo	3 (4)
Group	44 (53)
Teaching hospital practice	36 (43)
Practice location:	
Rural	36 (53)
Urban	32 (47)
% Of patient population ≥18 years old:	
About 50%	3 (3)
Greater than 50%	88 (94)
Less than 50%	3 (3)
Average patient contact hours:	
0-10	7 (8)
11-20	17 (18)
21-30	27 (29)
31-40	39 (43)
>40	2 (2)
Percent of patient population overweight/obese:	
0-25%	2 (2)
26-50%	42 (45)
51-75%	43 (46)
76-100%	3 (3)
Race/ethnicity:	
White	87 (93)
Black or African American	0 (0)
Hispanic or Latino	5 (5)
Asian	1 (1)
Native Hawaiian	0 (0)
American Indian	1 (1)

Table 2: Recommended medications and perceived effectiveness

Medication	Recommended (%)	Perceived Effective (%)
Orlistat	40	19
Phentermine	30	21
Phentermine/topiramate	27	33
Lorcaserin	12	13
Bupropion/naltrexone	12	21
Liraglutide	9	13
Diethylpropion	2	1
Benzphetamine	0	2
Phendimetrazine	0	0

Table 3: Important barriers to prescribing weight loss medications

Barrier (Important)	PCPs Combined (n)	APCs (n)	MDs (n)	P value
Fear of adverse events	91	47	44	0.963
Fear of medication interactions	83	45	38	0.322
Cost/insurance coverage	78	41	37	0.346
Lack of perceived effectiveness	78	34	44	0.001
Lack of patient motivation	72	40	32	0.104
Insufficient knowledge about available medication options	68	38	30	0.042
Insufficient knowledge about current guidelines/recommendations	62	35	27	0.156
Lack of available resources for prescribing weight loss medications	53	29	24	0.198
Lack of training & skill related to overall obesity management	44	28	16	0.007
Lack of time	22	14	8	0.107

Table 4: Important facilitators for prescribing weight loss medications

Facilitator (Important)	PCPs Combined (n)	APCs (n)	MDs (n)	P value
Patient has 2+ co-morbidities associated with obesity	82	45	37	0.039
Patient is severely obese (BMI 40 kg/m ² or above)	81	45	36	0.036
Patient has failed to achieve goal weight with lifestyle interventions alone	78	45	33	0.008
Patient requests medication	77	43	34	0.076
Insurance coverage	75	42	33	0.242
Patient has 1 co-morbidity associated with obesity	71	40	31	0.070
Patient is moderately obese (BMI 35-39.9 kg/m ²)	67	39	28	0.068
Patient is mildly obese (BMI 30-34.9 kg/m ²)	32	21	11	0.057

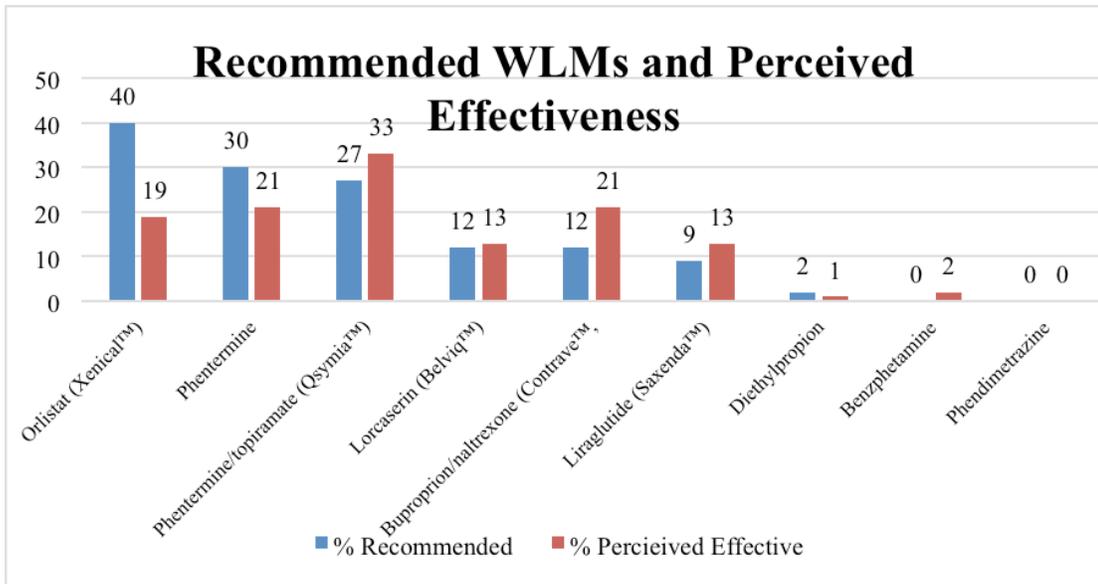


Figure 1: Comparison of recommended medications and perceived effectiveness

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APPENDIX A

Research Information Sheet

Title of Study: **Provider Attitudes and Practice Patterns of Obesity Management with Pharmacotherapy**

Principal Investigator (PI): Brittany Granara, RN

Faculty Sponsor: Dr. Jennifer Laurent, PhD, APRN

Funder: College of Nursing and Health Sciences

Introduction:

You are being invited to take part in this research study because you are a licensed, practicing health care provider in the state of Vermont. This study is being conducted by Brittany Granara, RN, in conjunction with Dr. Jennifer Laurent, PhD, APRN, at the University of Vermont.

Purpose

The primary purpose of this study is to determine current prescribing patterns among primary care providers of Food and Drug Administration (FDA) approved weight loss medications in the management of obesity. The study has three aims including, 1.) To determine why providers are or are not including weight loss medications in weight loss counseling, 2.) To determine what barriers exist around the use of weight loss medications in obesity management, and 3.) To determine under what circumstances providers are prescribing weight loss medications for obesity.

Study Procedures

If you choose to take part in the study, you will be asked to complete a one-time pen and paper and/or electronic survey. This survey is expected to take no longer than 10 minutes to complete. Questions on the survey include demographic information, current knowledge around available weight loss medications, current practice patterns around the use of weight loss medications, and barriers preventing the use of weight loss medications.

Some of the survey questions related to obesity pharmacotherapy may be familiar to you and others may not. No judgments about individual practice competency or skill will be made from the survey responses and there are no correct or incorrect answers to the questions being asked.

Benefits

By participating in this current research study, there may not be any direct benefit for you. However, information deemed from this study may benefit you and other health care providers in the future.

Risks

All data collected will not include personally identifying information in order to protect your privacy.

Costs

No costs will be required of you for participating in this research study

Compensation

Should you choose to participate, you will receive a raffle ticket upon completion of the survey to be entered into a lottery with your preferred contact information. One raffle number at your conference will be selected to receive a \$20 equivalent VISA gift card. If you are completing the online electronic survey, an additional separate hyperlink will be provided to you upon completion of the survey for you to enter your email information into the online raffle.

Confidentiality

All personal demographic information collected about you throughout this study will be kept anonymous and securely stored. No one will be capable of matching you to your responses.

Voluntary Participation/Withdrawal

This research study is completely voluntary and you are not required to participate in this survey. You are not required to complete every survey question to remain in the study, and you may withdraw from the study at any point during the completion of the study.

Questions

If you have any questions about this study at any time, please contact me, Brittany Granara, at the following phone number (802) 656-3024. If any questions or concerns arise regarding your rights as a research participant, you may contact the Director of the Research Protections Office at (802) 656-5040.

Participation

Participation in the study is voluntary. You may choose to not participate or withdraw from the research at any time without discrimination and/or penalty.

Contact Information

Principal Investigator
Brittany Granara, RN
(802) 656-3024
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APPENDIX B
Research Survey

Title of Study: Provider Attitudes and Practice Patterns of Obesity Management with Pharmacotherapy

Principle Investigator: Brittany Granara, RN

1. Do you see patients over the age of 18 years in your clinical practice?
 - a. Yes
 - b. No

2. Are you a primary care provider?
 - a. Yes
 - b. No

**If answered yes to questions 1-2, please proceed with survey. If no to either question 1 or 2, please stop here. Thank you for your time*

3. What type of practitioner are you? (Please circle one)
 - a. Nurse Practitioner
 - b. Physician Assistant
 - c. Physician

4. What is your primary specialty? _____

5. How many years have you practiced health care since completing your educational requirements? _____

6. Is greater than 50% of your clinical practice in primary care/internal medicine?
 - a. Yes
 - b. No

7. Please identify what statements best describe your practice
 - a. Solo practice
 - b. Group practice
 - c. Teaching hospital practice
 - d. Other: _____

8. What statement best describes your location of practice?
 - a. Rural
 - b. Urban
 - c. Other: _____

9. Approximately, what percentage of your patient population is aged ≥ 18 years?
 - a. Approximately 50%

- b. Greater than 50%
 - c. Less than 50%
10. How many patient contact hours do you have per week? _____
11. Do you currently care for patients who have obesity (BMI $\geq 30\text{kg/m}^2$)?
- a. Yes
 - b. No
 - c. Unknown
12. Approximately, what percentage of your population is overweight and/or obese?
- a. 0-25%
 - b. 26-50%
 - c. 51-75%
 - d. 76-100%
13. What is your overall impression of pharmacotherapy as a treatment for obesity?
- a. Very positive
 - b. Positive
 - c. Neutral
 - d. Negative
 - e. Very negative
 - f. Unknown- not familiar with pharmacotherapy for obesity
14. In your opinion, based on your clinical knowledge, currently available medications for the treatment of obesity are:
- a. Safe
 - b. Somewhat safe
 - c. Some medications are safe, others are not
 - d. Unsafe
15. Which, if any, medications have you recommended to a patient as a treatment for obesity? (Check all that apply)
- Orlistat (Xenical™)
 - Lorcaserin (Belviq™)
 - Bupropion/naltrexone (Contrave™, Mysimba™)
 - Phentermine/topiramate (Qsymia™)
 - Liraglutide (Saxenda™)
 - Phentermine
 - Benzphetamine
 - Phendimetrazine
 - Diethylpropion
 - Other (specify) _____
16. Which, if any, medications do you think are effective for weight loss?
(Check all that apply)

- Orlistat (Xenical™)
- Lorcaserin (Belviq™)
- Bupropion/naltrexone (Contrave™, Mysimba™)
- Phentermine/topiramate (Qsymia™)
- Liraglutide (Saxenda™)
- Phentermine
- Benzphetamine
- Phendimetrazine
- Diethylpropion
- Other (specify) _____

17. How much weight loss would you expect your patients to achieve with pharmacotherapy as an adjunct to lifestyle interventions?

- a. 0-5%
- b. 5-10%
- c. 10-15%
- d. >15%
- e. Unknown

18. Please indicate whether or not the following factors would be important or not important circumstances for recommending pharmacotherapy to your obese patients? (Please check all- either important or not important)

Important	Not Important	
<input type="checkbox"/>	<input type="checkbox"/>	
<input type="checkbox"/>	<input type="checkbox"/>	Patient requests medication
<input type="checkbox"/>	<input type="checkbox"/>	Insurance coverage
<input type="checkbox"/>	<input type="checkbox"/>	Patient has failed to achieve goal weight with lifestyle interventions alone
<input type="checkbox"/>	<input type="checkbox"/>	Patient is mildly obese (BMI 30-34.9 kg/m ²)
<input type="checkbox"/>	<input type="checkbox"/>	Patient is moderately obese (BMI 35-39.9 kg/m ²)
<input type="checkbox"/>	<input type="checkbox"/>	Patient is severely obese (BMI 40 kg/m ² or above)
<input type="checkbox"/>	<input type="checkbox"/>	Patient has 1 co-morbidity associated with obesity (i.e. type II diabetes, hypertension, hypercholesterolemia, arthritis, etc.)
<input type="checkbox"/>	<input type="checkbox"/>	Patient has 2+ co-morbidities associated with obesity

Other (please specify): _____

19. Please indicate whether or not the following factors would be important or not important factors in preventing you from prescribing pharmacotherapy as a treatment for obesity? (Please check all- either important or not important):

Important	Not Important	
<input type="checkbox"/>	<input type="checkbox"/>	Safety concerns- fear of adverse events
<input type="checkbox"/>	<input type="checkbox"/>	Fear of interaction with other medication
<input type="checkbox"/>	<input type="checkbox"/>	Cost/insurance coverage
<input type="checkbox"/>	<input type="checkbox"/>	Lack of perceived effectiveness
<input type="checkbox"/>	<input type="checkbox"/>	Insufficient knowledge about available medication options
<input type="checkbox"/>	<input type="checkbox"/>	Insufficient knowledge about current guidelines and recommendations
<input type="checkbox"/>	<input type="checkbox"/>	Lack of available resources for prescribing weight loss medications
<input type="checkbox"/>	<input type="checkbox"/>	Lack of training and skill related to overall obesity management
<input type="checkbox"/>	<input type="checkbox"/>	Lack of patient motivation
<input type="checkbox"/>	<input type="checkbox"/>	Lack of time
<input type="checkbox"/>	<input type="checkbox"/>	Other (please specify): _____

20. If cost and insurance coverage were not barriers, would you then prescribe pharmacotherapy as a treatment for obesity in addition to lifestyle modifications?

- a. Yes
- b. No

21. Is fear of adverse events preventing you from prescribing weight loss medications to your obese patients?

- a. Yes
- b. No

22. Do you currently prescribe weight loss medication for short-term weight loss therapy (less than 3 months)?
- a. Yes
 - b. No
23. Do you currently prescribe weight loss medication for long-term weight loss therapy (≥ 3 months)?
- a. Yes
 - b. No
24. What is your race/ethnicity? (Check all that apply)
- White
 - Black or African American
 - Hispanic or Latino
 - Asian
 - Native Hawaiian
 - American Indian
 - Other (specify): _____