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Factors Influencing Nurse Practitioners' Weight Management Practices in Primary Care

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FACTORS INFLUENCING NURSE PRACTITIONERS' WEIGHT MANAGEMENT PRACTICES IN PRIMARY CARE

by

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ABSTRACT

More American adults are overweight or obese than ever before. Nurse practitioners (NPs) play a critical and expanding role in primary care, which is an ideal setting for the assessment and management of weight loss. NPs can make a significant contribution to tackling the obesity crisis. The study presented here seeks to close the gap in data related to how NPs approach weight management with their primary care patients. This study focused on a comprehensive examination of the current practice patterns of NPs related to weight management, a theoretical concept analysis of weight bias among healthcare providers, along with the results of a cross-sectional survey that investigated primary care NPs' weight management practice patterns and the relationship among attitudes, perceived barriers, self-efficacy, perceived skill, and demographic characteristics. The results from this study may be applied to provider training and education for obesity and weight management that ultimately improves patients' health outcomes.

Keywords: nurse practitioner, weight management, primary care

This dissertation is dedicated to my husband, Eric and my daughter, Isabelle Mariposa. For your endless support and encouragement. I could not have finished this program without you at my side. *Los amo.*

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CHAPTER 1:
INTRODUCTION

Obesity is defined by a measurement of body mass index (BMI, kg/m^2) of 30 or greater (Hales, Carroll, Fryar, & Ogden, 2017). BMI is calculated using a person's height and weight and is not a direct measurement or indictor of body fat (Centers for Disease Control and Prevention [CDC], 2017). High BMI is associated with certain risks such as type 2 diabetes, cardiovascular disease, and stroke (CDC, 2018). The prevalence of obesity is highest among adults aged 40-59 (42.8%), Hispanic (47%) and non-Hispanic black (46.8%) adults, and adults without a high school education (35.5%) (Hales et al., 2017; Ogden et al., 2017).

Primary care providers can deliver effective strategies and interventions to manage patients with obesity (Tsai, Remmert, Butryn, & Wadden, 2018). Nurse practitioners (NPs) have an opportunity to take the lead in primary care to deliver weight management programs. This is particularly relevant in Florida where the primary care physician shortage is expected to continue through 2025 (U.S. Department of Health and Human Services, 2016).

There is existing evidence of the practice patterns of healthcare providers (HCPs) like nurses, physicians, and nutritionists, and how they manage patients with obesity (Petrin, Kahan, Turner, Gallagher, & Dietz, 2017). Researchers have uncovered various barriers to implementing weight management interventions. Common barriers include lack of time and lack of reimbursement (Briscoe & Berry, 2009). Additionally, the literature supports the mechanisms that facilitate the providers' efforts to tackle obesity. This includes additional training and resources (Steglitz, Sommers, Talen, Thornton, & Spring, 2015).

However, there is a gap in the literature related to the weight management practice patterns of primary care NPs. The purpose of this study was to examine NP's perceptions and practice patterns and explore factors that influence these practices. The integrative literature review in this study sought to examine reported weight management practices and generate a narrative synthesis of the current literature. The variable attitudes toward persons with obesity was explored in depth with the concept analysis of weight bias among HCPs. Weight bias is a common phenomenon at work, at school, and in healthcare. Weight bias among HCPs may lead to poor patient-provider interactions and negatively impact health outcomes. Developing a clear conceptual definition of weight bias could lead to provider self-awareness of weight bias and interventions to decrease it. Furthermore, a cross-sectional survey was used with a sample of Florida primary care NPs which aimed to quantify weight management practices and psychosocial variables. Statistical analysis of these variables explored the relationship and influence of attitudes toward persons with obesity, self-efficacy, barriers, and demographic and practice data.

Theoretical Framework

The framework for this study was based on the Health Promotion Model (HPM; Pender, Murdaugh, & Parsons, 2002). The theory proposes that individual characteristics and experiences along with behavior-specific cognitions and affect influence the commitment to or the occurrence of health-promoting behavior. The behavior-specific cognitions include: (a) perceived benefits of action; (b) perceived barriers; (c) perceived self-efficacy; (d) affect; (e)

interpersonal influences; (f) situational influences; (g) commitment to a plan of action; and (h) immediate competing demands (Pender et al., 2002).

The framework offers a guide for exploring variables that influence behavior. This study drew on the constructs and definitions from the HPM including individual characteristics (prior related behavior and personal factor), behavior-specific cognitions (perceived barriers, perceived self-efficacy), and the behavioral outcome (see Figure 1.1). It was hypothesized that factors such as previous experience, education, demographic variables, attitude toward persons with obesity, perceived barriers, and perceived self-efficacy would predict the NP's health promoting behavior evidenced by their reported weight management practices.

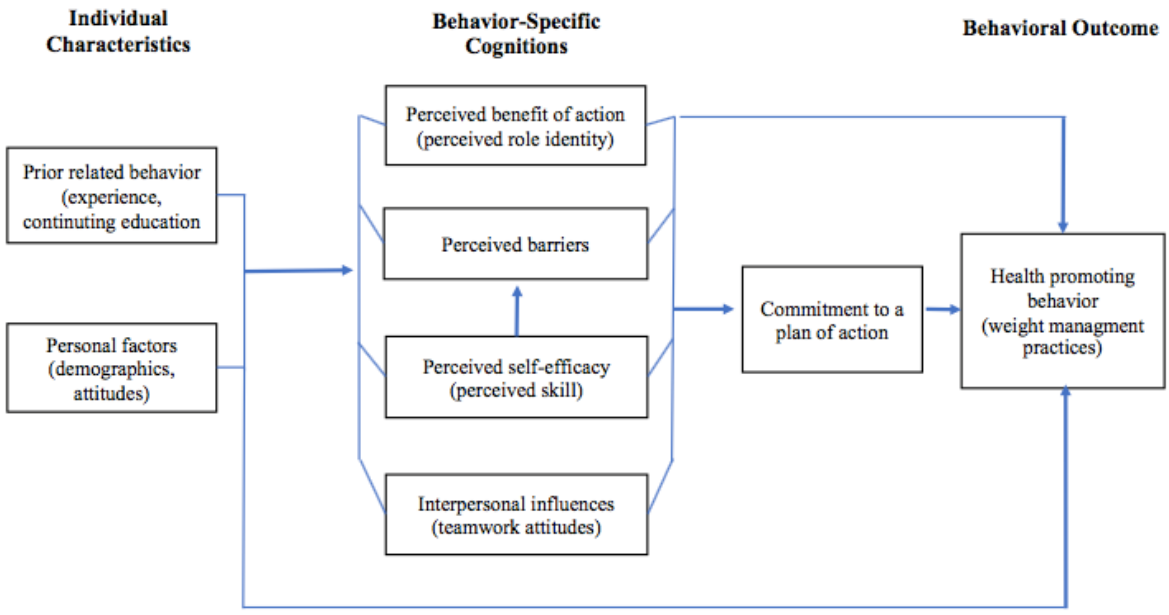

Figure 1.1. Adapted health care promotion model.

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CHAPTER 2:
PRACTICE PATTERNS OF NURSE PRACTITIONERS RELATED TO WEIGHT MANAGEMENT IN PRIMARY CARE: AN INTEGRATIVE LITERATURE REVIEW[1]

Abstract

Obesity prevalence rates for adults are at an all-time high. This integrative review of the literature aimed to examine the practice patterns of nurse practitioners (NPs) related to weight management in primary care and recommend future areas of research as it relates to the diagnosis and management of patients with obesity among NPs. The databases CINAHL PLUS with Full Text, Cochrane Central Register of Controlled Trials, ERIC, MEDLINE, PsycINFO, and SPORTDiscuss were searched. The initial search resulted in 169 articles. Fifteen peer-reviewed articles from 13 studies were included in the analysis. Four themes emerged from analysis: approach to practice; the practitioner's role within the interdisciplinary team; communication; and resources and tools. This review was conducted in order to better understand the challenges and facilitators to the management of patients with obesity in primary care. Future research between NPs and variables related to obesity are necessary to further identify areas for education, training, and policy development.

Keywords: obesity, nurse practitioner, practice

[1] Hyer, S. (2019). Practice patterns of nurse practitioners related to weight management in primary care: A systematic literature review. *Journal of the American Association of Nurse Practitioner, 31*(4), 236-244. doi:10.1097/JXX.0000000000000122

Introduction

More American adults are overweight or obese now more than ever before in history. Obesity is defined as a body mass index (BMI, kg/m^2) of 30 or greater and extreme obesity is defined as a BMI of 40 or greater (Centers for Disease Control & Prevention [CDC], 2016). Data from the 2013-2014 National Health and Nutrition Examination Survey (NHANES) indicated obesity prevalence rates around 38%, with 1 in 13 adults presenting with extreme obesity (Flegal, Kruszon-Moran, Carroll, Fryar, & Ogden, 2016). Multiple health risks are associated with obesity, such as hypertension, diabetes, and cancer (National Heart, Lung, Blood Institute [NHLBI], 2012). Moreover, obesity is associated with increased cardiovascular disease mortality with an estimated 12 adults dying every hour within the United States (Flegal, Graubard, Williamson, & Gail, 2007). A systematic review on the economic impact of obesity found direct medical spending costs the U.S. $86-147 billion each year while indirect costs such as absenteeism, presenteeism, and disability amount to an additional $66 billion each year (Hammond & Levine, 2010).

Multiple professional organizations have developed and/or endorsed practice guidelines for the management of obesity. Two such guidelines published within the U.S. include the American Heart Association/American College of Cardiology/The Obesity Society guideline (Jensen et al., 2013) and the Association of Clinical Endocrinologist/American College of Endocrinology guidelines (Garvey et al., 2016). These guidelines are in addition to evidence reviews provided by the NHLBI (2013) and the Agency for Healthcare Research and Quality (AHRQ; LeBlanc, O'Connor, Whitlock, Patnode, & Kapka, 2011). The availability of these clinical resources to providers does not necessarily ease the transition of guidelines into practice.

Despite the American Medical Association's (2013) declaration that obesity is a chronic disease, weight-related discussions between patient and physician are not uniformly conducted (Antognoli et al., 2014; Pool et al., 2014). Barriers to weight management among providers include lack of time, inadequate reimbursement, and the stigma of obesity (Geense, van de Glind, Visscher, & van Achterberg, 2013; Mold & Forbes, 2013; Timmerman, Reifsnider, & Allan, 2000). Providers who do not take an active role in weight counseling must still provide a thorough assessment and treatment options for patients with obesity (Tsai & Wadden, 2009).

Primary care is positioned as accessible, first contact medical care and more importantly as continuous and comprehensive (Institute of Medicine, 1996). The primary care setting is ideal for the assessment and management of weight loss (Jay, Chintapalli, Squires, Mateo, Sherman, & Kalet, 2015; Phillips, Wood, & Kinnersley, 2014). Nurse practitioners (NPs) have an integral role in primary care settings (Naylor & Kurtzmann, 2010). With more than 80% of NPs educated in primary care (American Association of Nurse Practitioners [AANP], 2017) NPs can make a significant contribution to tackling the obesity crisis (Fruh, 2017). However, there is a gap in data related to how NPs treat obesity which could be used as a needs analysis for educational interventions. A comprehensive examination of the current practice patterns of NPs related to weight management is critical to understanding challenges and facilitators to counseling and treating patients with obesity. This article aims to examine the practice patterns of NPs related to weight management in primary care.

Methods

Design and Sample

The databases CINAHL PLUS with Full Text, Cochrane Central Register of Controlled Trials, ERIC, MEDLINE, PsycINFO, and SPORTDiscuss were searched. Index and free text terms included a variation of the terms obesity, nurse practitioner, and practices. See Figure 2.1 for specific terms. Studies were included if they were published in a peer-reviewed journal from 2010 to April 2018, written in English, and addressed weight management practice patterns of NPs with primary care adult patients. Date limitations were based on the enactment of The Patient Protection Affordable Care Act (ACA, 2010) which initiated changes for the health care system, augmenting preventative care models including expanding benefits for obesity management, and programs focusing on care delivered by nurses. Citation searches were also undertaken. Articles were excluded if the study focused on children, adolescents, or pregnancy-related care, was conducted outside of primary care, or did not address obesity management.

obesity, obes*, overweight weight control, weight, weight reduction programs
nurse practitioners+, nurse practitioner*, ARNP, FNP
practic* pattern*, practices, patient relations, communicat*

Figure 2.1. Keyword search terms.

Findings

The initial search resulted in 169 articles. Citation searches revealed three additional articles. Following the removal of duplicate articles, the titles and abstracts of 119 articles were screened for exclusion criteria. Twenty-nine articles were read in their entirety. A depiction of the methodology can be found in Figure 2.2. Fifteen articles from 13 studies were included in the analysis. Critical appraisal of the included studies was based on the Joanna Briggs Institute (2017) criteria. Eight articles had a quantitative design including: a randomized controlled trial (1), quasi-experimental (2), self-report survey (4), and retrospective data analysis (1). Seven articles had a qualitative design of which five studies conducted individual interviews, one study used focus groups, and one study conducted interviews along with virtual focus groups. A majority of the studies were conducted within North America with one study conducted in the United Kingdom (U.K.) and another in The Netherlands.

The questions used to guide this literature review included: Are NPs managing obesity? What interventions are being used? What are the outcomes? What are the experiences of NPs who deliver weight management practices? Using a standardized data extraction table, the author abstracted the study design, setting, sample characteristics, description of measure, and outcome/findings from each article. A summary of the study characteristics is provided in Table 2.1. Four themes emerged from analysis of the data extracted from the published articles on the weight management practices of NPs: (a) approach to practice; (b) the practitioner's role within the interdisciplinary team; (c) communication; and (d) resources and tools.

Approach to Practice

Seven studies reported NPs identify and assess weight status during an office visit (Courtney & Dickson, 2010; Granara & Laurent, 2017; Jarl, Tolentino, James, Clark, & Ryan, 2014; Magee, Everts, & Jamison, 2012; Petrin, Kahan, Turner, Gallagher, & Dietz, 2016; Petrin, Kahan, Turner, Gallagher, & Dietz, 2017; Schauer, Woodruff, Hotz, & Kegler, 2014). Additionally, the research indicated providers intervene or counsel patients regarding obesity (Courtney & Dickson, 2010; Granara & Laurent, 2017; Jarl et al., 2014; Magee et al., 2012; Petrin et al., 2016).

Prescribing patterns of weight loss medications among NPs varied from rarely prescribing to half of study participants reporting the practice of using weight loss pharmaceuticals (Courtney & Dickson, 2010; Granara & Laurent, 2017; Petrin et al., 2016). When NPs do prescribe weight loss pharmaceuticals, the reported thresholds that prompt the prescription were not aligned with national guidelines of pharmacotherapy (Granara & Laurent, 2017; Petrin et al., 2016). Similarly, referrals for bariatric surgery varied greatly from rarely making a referral to 70% of participants referring out for consultation (Courtney & Dickson, 2010; Petrin et al., 2016).

Scope of practice restrictions, safety concerns regarding medications, and lack of insurance coverage for surgery were cited as reasons for these practice patterns (Granara & Laurent, 2017; Petrin et al., 2016). Counseling on weight loss or obesity was often times accompanied with discussions on obesity-related risk factors (Petrin et al., 2017). Notably, among clinical considerations e.g. risk of heart disease or diabetes, NPs discussed quality of life

considerations such as activities of daily living more often than other providers (Petrin et al., 2017).

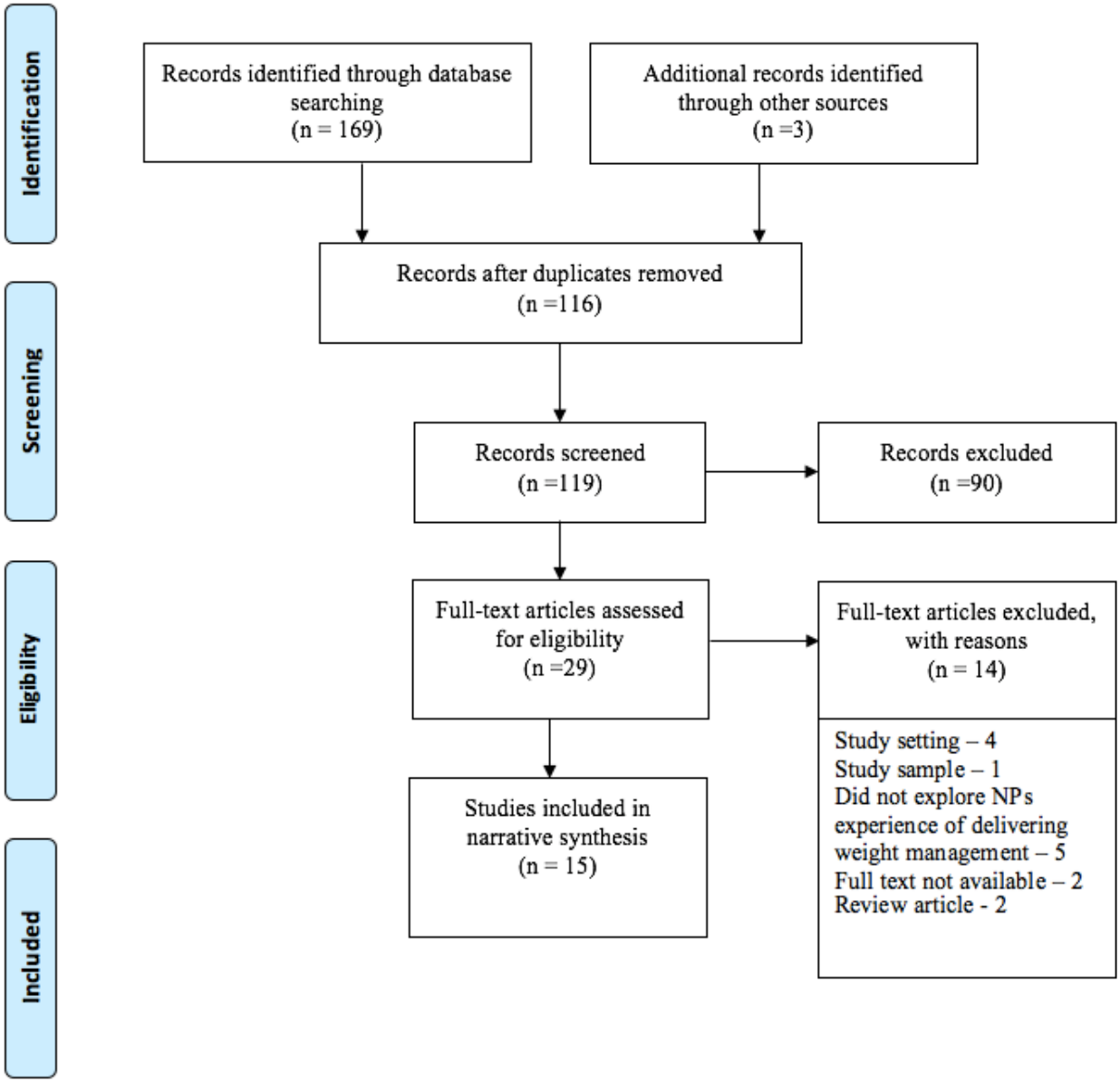

Figure 2.2. Flow diagram of literature search according to the PRISMA statement.

Table 2.1

Data Summary Table

Source	Design	Sample Size	Study Aim	Findings
Asselin, Osumlana et al., 2016	Qualitative, interviews	29	Describe the role of interdisciplinary collaboration within the 5As Team trial	The ability of HCP to address weight with patients was largely guided by strong communication and clinic relationships within the interdisciplinary team
Asselin, Salami, et al., 2017	Qualitative, interviews & questionnaires	28	Discuss HCP perspective of the impact of the new practice approach to obesity	Internalization of new practice approaches are achieved through increased self-awareness and reflection which led to positive changes in patient-provider and team relationships
Chung et al., 2015	Qualitative, interviews	21	Describe practices, goals, and barriers with the use of life-log data	Self-monitoring data can support diagnosis and treatment; build patient- provider relationships; tailor treatment plans to patient priorities and routines. Barriers included time, knowledge, and compensation associated with its integration
Courtney et al., 2010	Observational, electronic self-report survey	599	Discover practice patterns, attitudes, and perceived barriers to managing obesity	Majority assess, calculate BMI, and counsel, set joint weight loss goals, recommend PA. WL medication and bariatric surgery were rarely discussed
Driehuis et al., 2012	RCT	457	Evaluate the 3-year effect of lifestyle counseling by a NP on PA and diet compared with usual care by a GP	Activity increased along with diet improvements were made for both NP and GP groups. Three-year changes in PA and diet did not differ significantly between groups
Granara et al., 2017	Observational electronic self-report survey	94	Determine attitudes and practice patterns of WL medications	Majority of PCPs do not prescribe medication for short term nor long-term weight loss & report negative perceptions of weight loss medication. Severe obesity and multi-comorbidities increased likelihood of prescribing WL medication
Gudzune et al., 2012	Qualitative, focus groups	26	Explore provider communication related to weight management	Various methods are used to communicate WL strategies many of which are patient-centered. When challenges were met, standardized messages or avoidance were used

Source	Design	Sample Size	Study Aim	Findings
Hayes et al., 2017	Qualitative, interviews and virtual focus groups	31	Identify challenges of PCPs related to managing obesity	Inconsistent primary care team integration with a lack of understanding role responsibilities in addition to reactively treating comorbidities instead of proactivity managing patients with obesity
Jarl, et al., 2014	Quasi-experimental	45	NP led intervention for diet and lifestyle counseling	Improvements in patient diet and lifestyle scores on both REAP and PIH questionnaires/ increased PA reported. Average WL was 3.6 pounds
Magee et al., 2012	Retrospective chart review	180	Review archived data for initiating WL interventions	NPs intervened 61% of the time with patients with increased BMI while physicians intervened 7.8% of the time
Nolan et al., 2012	Qualitative, interviews	22	Factors related to managing obesity	Positive factors: PNs identified their role in obesity management, self-efficacy in communication skills, training and time. Negative factors: low awareness of guidelines and referral process, limited knowledge on approaches, small impact on outcomes, lack of clarity on their role within the practice
Petrin et al., 2016	Observational electronic self- report survey	1501	Identify beliefs, practices, and knowledge on drug therapy, bariatric surgery referrals, and coding	Physicians more likely to prescribe WL medication and recommend bariatric surgery than NPs. Many providers do not use obesity specific CPT codes for WM or counseling
Petrin et al., 2017	Observational electronic self- report survey	1501	Identify beliefs, practices, and knowledge on obesity, practices on counseling and treatment	More time, training, reimbursement, & risk tools needed to improve ability to counsel. Obesity-related counseling discussed risk of comorbidities and ADLs
Schauer et al., 2014	Qualitative, interviews	30	Explore approaches to counseling (who, how, what advice, and what treatment)	Clinicians tend counsel established patients, address weight-related conditions, or change in weight. Advice generally not based on guidelines.
Steglitz et al., 2015	Quasi-experimental	12	Assess the impact of obesity intake protocol and EHR on the management of adult obesity	New protocol and EHR form eased the identification of patients with obesity and increased provider confidence about managing obesity. Treatment group twice as likely

Source	Design	Sample Size	Study Aim	Findings
				to receive weight-loss counseling after the form and protocol were introduced

Note. HCP = healthcare professional; BMI = body mass index; PA= physical activity; RCT = randomized controlled trial; WL= weight loss; NP = nurse practitioner; GP = general practitioner; PCP = primary care provider; REAP= Rapid Eating Assessment for Patients; PIH = Partners in Health; PN = practice nurse; WM = weight management; ADLs = activities of daily living; EHR= electronic health record.

Practitioner's Role Within the Interdisciplinary Team

The lens from which the healthcare provider views his or her role in managing obesity within an interdisciplinary team was described in five studies (Asselin, Osunlana, Ogunleye, Sharma, & Campbell-Scherer, 2016,; Asselin et al., 2017; Hayes, Wolf, Labbé, Peterson, & Murray, 2017; Nolan, Deehan, Wylie, & Jones, 2012; Petrin et al., 2017). Studies showed the positive impact of the provider's perceived responsibility for managing obesity (Asselin et al., 2016; Nolan et al., 2012; Petrin et al., 2017). Sixty-five percent of primary care physicians, obstetricians, and NPs surveyed believe patient counseling on obesity is a shared responsibility between the patient and the provider (Petrin et al., 2017). In addition, providers perceived that a high functioning interdisciplinary team approach positively affected the patient provider experience (Asselin et al., 2016; Asselin et al., 2017). Furthermore, the successful management of the patient with obesity was strongly linked to the interdisciplinary team's relationship among team members (Asselin et al., 2016; Asselin et al., 2017). For example, in one qualitative study, practice nurses (PNs) in a U.K. general practice setting who had a positive view of their role in weight management had received training on obesity management and used the training in their practice or were able to refer patients to colleagues within the office (Nolan et al., 2012). Conversely, inconsistent team integration and a lack of role identity led to perceived challenges in managing obesity (Hayes et al., 2017; Nolan et al., 2012).

Communication

Communication patterns surrounding weight management were discussed consistently in the literature. This includes the quality of communication among team members (Asselin et al., 2016; Hayes et al., 2017) and the quality of communication with patients (Chung, Cook, Bales, Zia, & Munson, 2015; Driehuis, 2012; Gudzune, Clark, Appel, & Bennett, 2012; Petrin et al., 2017; Schauer et al., 2014). Indicators of quality were identified as open communication that supports the patient-provider relationship which can lead to improved patient outcomes (Chung et al., 2015). This starts with a patient-centered approach (Gudzune et al., 2012) and using preferred terminology when talking with patients (Petrin et al., 2017). Between 76% and 84% of healthcare providers reported the use of terms such as exercise, physical activity or eating habits as opposed to unhealthy weight (47%) or heavy (20%) when counseling on weight loss (Petrin et al., 2017). Communication and clinic relationships were cited as key to successful weight management practices in data from participant interviews from a mixed-methods randomized controlled trial for a healthcare team-based educational intervention (Asselin et al., 2016).

Resources and Tools

Weight management requires a multidimensional approach by the practitioner. Five studies described the utilization, or lack thereof, of tools as a resource for educating, counseling, or documenting (Chung et al., 2015; Jarl et al., 2014; Petrin et al., 2017; Schauer et al., 2014; Steglitz, Sommers, Talen, Thornton, & Spring, 2015). Practitioners conveyed a need for efficient tools to effectively deliver weight loss counseling (Chung et al., 2015; Jarl et al., 2014).

Examples of tools included brochures, electronic health record (EHR) forms, mobile phone applications (apps), or risk assessment tools. Chung and colleagues (2015) described the benefits of integrating personal life-log data into the practice environment. Life-log data such as diet or exercise routines are usually captured through electronic devices or mobile phone apps. Benefits of using life-log data outlined by providers support both the diagnosis and treatment, and build patient-provider relationships (Chung et al., 2015). The integration of an obesity protocol and customized EHR form increased the likelihood of receiving weight loss counseling for an intervention group by two-fold compared to a control group; however, no significant change in BMI was found (Steglitz et al., 2015). Introducing technology such as apps or EHR to the clinic environment is not without challenges. Providers cited difficulties interfacing with systems and the technology consuming more time than desired (Chung et al., 2015; Steglitz et al., 2015).

Discussion

A number of gaps emerged from the data. First, there are a limited number of studies that focus on the NPs' individual weight management practice patterns. Much of the data presented in this review was aggregated data from multiple disciplines e.g. physicians, physician assistants, mental health professionals, dieticians, and NPs. A collaborative team approach to weight management is warranted to enhance patient care. However, given the depth of information specific to primary care physicians' practice patterns, it is worthwhile to explore the attributes of NPs' individual weight management practice patterns to identify knowledge, skills and abilities that will ultimately enrich the team dynamic and improve the quality of patient care.

Second, findings from this review highlight the gap in the report of measurable variables that may influence weight management practices. Quantitative data on NP's self-efficacy, attitudes toward patients with obesity, perceived skill, and weight management practices are clearly lacking in the current literature. Evaluating quantifiable data may identify best practices and inform further development.

Lastly, the reliability and validity of the measurement tools was not uniformly described in the literature. Survey questionnaires from four studies included in this review were generated by the author and lacked psychometric data (Courtney & Dickson, 2010; Granara & Laurent, 2017; Petrin et al., 2016; Petrin et al., 2017).

Practice and Policy Implications

Health policies can play a role in changing population-wide behavior that leads to improvements in health outcomes among patients with obesity (Schwartz, Just, Chriqui, & Ammerman, 2017). NPs should examine how current policies affect their practice and advocate for policies that place patient outcomes as a priority. An overwhelmingly consistent theme among providers is the need for policy change regarding the compensation or reimbursement for weight management in primary care. Lack of compensation or inadequate reimbursement has been reported as a barrier to managing weight loss in multiple publications (Chung et al., 2015; Courtney & Dickson, 2010; Nolan et al., 2012; Petrin et al., 2017). The ACA (2010) expanded obesity-related services for Medicaid enrollees and the Centers for Medicare and Medicaid (2012) established national coverage for intensive behavioral therapy for individuals entitled to benefits. However, three out of four patients reported a lack of insurance coverage for obesity

treatment by private insurance companies (Kyle & Nadglowski, 2015). Additionally, overall obesity prevalence rates are highest among middle aged adults (40-59 years old) who may not be recipients of federally-funded insurance programs (Ogden, Carroll, Fryar, Flegal, 2015). Patients may be reluctant to undergo treatment without sufficient insurance coverage (Kannan & Veazie, 2014).

A phenomenon that is detrimental to the identification and management of obesity is the lack of a formal diagnosis of obesity via ICD-9 documentation within the patient's health record (Burguera, 2016). Patients are more likely to receive weight management counseling if they are diagnosed with obesity (Bleich, Pickett-Blakely, & Cooper, 2011). The literature suggests providers may not see the benefit of coding the diagnosis if they will not be adequately reimbursed (Burguera, 2016). Weight loss attempt and realistic perceptions of weight were positively correlated with provider weight discussions (Rose, Gokun, Talbert, & Conigliaro, 2013).

Building on the general reimbursement policy issue for managing obesity is the limited and inconsistent scope of practice (SOP) for NPs. The discussion for independent SOP laws is beyond the scope of this paper. The focus here is the connection between payer policies and the state's specified SOP laws (Yee, Boukus, Cross, & Samuel, 2013). In states with restricted SOP laws NPs may not be designated as primary care providers, which decreases their payment rate for services (Yee et al., 2013). There is a direct relationship between the payer's refusal to credential NPs as primary care providers and the state law governing prescriptive authority (Hansen-Turton et al., 2006) with some payers imposing additional restrictions on NPs (Yee et al., 2013). Reports describe the practice of billing 'incident to' a physician's service, which

increases the standard 85% reimbursement rate of NP services to 100% of the physician rate (Buerhaus et al., 2018; Yee et al., 2013). Also, incident to billing masks the services provided by NPs and consequently hinders analysis of reporting data on claims and quality of care around obesity management and other conditions (Buerhaus et al., 2018; Yee et al., 2013).

Conclusion

The complexities of obesity and weight management demonstrate the need for individualized treatment plans that holistically support weight loss (Nelson, Ruffalo, Dyer, & Nelson, 2016). Notwithstanding, challenges remain in managing patients with obesity within the primary care setting despite guidelines from professional organizations (Jensen et al., 2013; U.S. Preventative Services Task Force [USPSTF], 2012). This review of the literature revealed that the inconsistent management of obesity among practitioners may lie within their perceived role identity, communication practices, and available resources. These factors may be compounded by dysfunctional team dynamics, lack of referral sources or system level support such as clinical protocols or EHR tracking.

There is a need for future research that explores variables such as NPs' perceived self-efficacy, attitudes toward weight management, and attitudes toward patients with obesity as they relate to the diagnosis and management of obesity. Given the relative limited number of studies, it is necessary to quantify these variables to further identify areas for education, training, policy development and most importantly, appropriate patient care.

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CHAPTER 3:
CONCEPT OF WEIGHT BIAS AMONG HEALTHCARE PROFESSIONALS: AN EVOLUTIONARY ANALYSIS

Abstract

The aim of this concept analysis was to identify the attributes of weight bias among healthcare providers (HCPs) and create a clear definition to guide the recognition of weight bias among HCPs. Settings within the healthcare system are not exempt from bias and the stigmatization of persons with obesity. Weight bias among HCPs may negatively impact health care and health outcomes. Rodger's evolutionary method was used to guide this concept analysis. The databases CINAHL Plus with Full Text, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MEDLINE, and PsycINFO were searched. The analysis provided clarification of the concept in order to facilitate HCP self-awareness of weight bias. A definition of the concept of weight bias among HCPs is provided along with its attributes, antecedents, and consequences.

Keywords: weight bias, healthcare professionals, concept analysis, evolutionary method

Introduction

Globally, there are over 650 million adults with obesity (World Health Organization, 2018). The most commonly used screening tool, a body mass index (BMI, kg/m^2) of greater than or equal to 30 is used to classify obesity (Ahn, Smith, & Ory, 2012). This is not a clear indication of one's body fat or health (Centers for Disease Control and Prevention [CDC], 2017). However, excess bodyweight is associated with increased mortality and array of comorbidities such as cardiovascular disease, type 2 diabetes, and certain cancers (CDC, 2018). The complexity of the

causes and contributing factors of obesity may be underappreciated by the general public and healthcare providers (HCPs).

Despite the high rate of obesity, weight bias is prevalent in many settings and relationships (Puhl & Heuer, 2009). The dictionary definition of bias states that it is a prejudice, either in favor or against something or someone (Oxford University Press, 2019). A recent literature review indicated that persons with obesity are subject to weight bias at work, school, and in interpersonal relationships (Puhl & Heuer, 2009). Cultural norms and portrayals of ideal body sizes reinforce this bias (Aranda & McGreevy, 2014; Brown, 2006). However infrequently, an anti-thin bias was reported in the literature (Hodgkinson, Smith, Hare, & Wittkowski, 2017; Miller et al., 2013). Nonetheless, the impact of an anti-obesity bias and stigma has adverse consequences (Alberga, Russell-Mayhew, von Ranson, & McLaren, 2016).

Settings within the healthcare system are not exempt from bias and the stigmatization of persons with obesity (Budd, Mariotti, Graff, & Falkenstein, 2011). HCPs, not unlike the general public, endorse stereotypes of obesity (Puhl & Heuer, 2009) which could affect the patient-provider interaction. Patient reports of the HCP's negative attitudes, disrespectful treatment, and inappropriate comments (Bachman et al., 2008), undermine the patient-provider relationship. The lack of accommodations such as inadequately sized scales, blood pressure cuffs, and office furniture may further signal the HCP's bias (Friedman, Ashmore, & Applegate, 2008).

Patients perceiving weight bias reported higher levels of depression on self-report questionnaires and expressed concerns related to eating, weight, and body shape (Barnes, Ivezaj, & Grilo, 2014). These patients also reported increased psychological distress (Budd et al., 2011; Friedman et al., 2008) and decreased patient satisfaction (Phelan, Burgess, et al., 2015). One of

the most concerning consequences of perceived weight bias from HCPs is treatment avoidance (Mold & Forbes, 2013; Teixeira & Budd, 2010). For example, perceptions of negative attitudes may discourage women with obesity from obtaining preventive gynecological screenings (Aldrich & Hackley, 2010). As a result of avoiding treatment, patients with obesity were likely to present with a more advanced disease process when they were finally evaluated (Phelan, Burgess, et al., 2015). Ultimately, the relationship between the patient with obesity and the HCP is likely to influence the effectiveness of obesity care (Mold & Forbes, 2013).

Several theoretical models attempt to explain weight bias or the stigmatization of persons with obesity. The attribution-value model of prejudice proposed by Crandall et al. (2001) hypothesized that people are prejudiced against individuals or groups that possess a negative attribute such as obesity, and hold these individuals responsible for the attribute. This stems from the belief that persons with obesity have a negatively valued characteristic such as laziness, and that obesity is controllable. The authors posit that judgements of responsibility predicts an anti-fat prejudice (Crandall et al., 2001). When HCPs focus on blame and personal responsibility as primary contributors to weight gain, healthcare disparities widen due to the lack of health promotion efforts by these HCPs (Brochu, Pearl, & Simontacchi, 2018). HCPs' perceptions of persons with obesity are a potential barrier to appropriate care and treatment for this population.

Rodgers' (1989) evolutionary view was the method chosen to analyze the concept of weight bias among HCPs. Concepts, as described by Rodgers, are formed by the identification of common characteristics of a phenomenon and are developed within the contexts of time and varying situations (1989). The clarification of concepts is necessary in order to describe phenomena and situations with the goal of using the concept more effectively (Rodgers, 2000).

Analysis of the concept allows the researcher to advance its definition and reflect a contemporary view of the concept (Rodgers, 1989). The volume of literature on weight bias is increasing in response to the rising public health challenge that obesity has within society. As indicated by Toulmin (1972), "significance [of the concept] is influenced by a variety of internal and external factors that provide incentives for the use and refinement of certain concepts to stimulate continuing development" (Rodgers, 1989, p.332). In pursuit of this goal, the analysis presented here followed the steps for Rodger's evolutionary method. This method includes identification of: a) the concept of interest and surrogate terms; b) an appropriate sample; c) attributes, antecedents, and consequences; d) an exemplar case; and e) implications for further development. The aim of this concept analysis was to identify the attributes of weight bias among HCPs and create a clear definition to guide the recognition of weight bias among HCPs.

Setting and Sample

In this literature-based analysis, the databases CINAHL Plus with Full Text, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MEDLINE, and PsycINFO were searched. Multiple electronic databases were chosen due to the interest of this concept among disciplines such as nursing, medicine, psychology, and allied-health fields. Keyword search criteria included the index and free text terms weight (and related terms overweight or obese), provider (and related terms nurse or physician), and bias (and related terms attitude, attitude to obesity, stigma). The search was limited to literature published in English from 2007 to February 2019, that focused on the HCP's bias toward obesity or patients with obesity. Because obesity is increasingly a global issue (Afshin et al., 2017), no geographic

limitations were used. The date limitations sought to capture literature surrounding the following noteworthy advancements in obesity care. First, the 2008 National Heart, Lung, and Blood Institute (2013) initiated systematic reviews to update clinical guidelines for obesity; previous guidelines dated back to 1977. Second, the American Medical Association's (AMA) 2013 policy recognized obesity as a disease, with the increased possibility that the change would reduce the stigma of obesity by the public and providers (Obesity Medicine Association, 2013). Lastly, the American College of Cardiology/American Heart Association Task Force published clinical guidelines in late 2013 that provided updated evidence-based recommendations for HCPs (Jensen et al., 2013). Articles related to children or adolescents, editorials, opinions, or that did not include descriptions of the concept of weight bias among HCPs were excluded.

The initial search resulted in 365 unduplicated articles. Following title review, 132 abstracts were reviewed for inclusion criteria. Articles were excluded if they did not explore weight bias from the HCP's perspective, if they were editorials or commentaries, or if full text was not available. Forty-two articles, one book chapter, and one dissertation were included in the final analysis. Critical appraisal of the included articles was guided by the following questions: How is weight bias described among HCPs? What factors are associated with weight bias among HCPs? How is weight bias measured? What are the consequences of weight bias among HCPs?

Findings

Following the evolutionary methodology for data management (Rodgers, 2000) articles were identified and coded by discipline: nursing (n = 16), medicine (n = 12), psychology (n = 8), public health and policy (n = 4), nutrition (n = 2) and allied health (n = 2). Each article was read

at least once in order to become familiar with the writer's use of the concept. Afterwards, data for each element of the evolutionary concept analysis process was extracted and organized by category including surrogate terms, attributes, antecedents, and consequences (Rodgers, 2000). Terms were analyzed for comparisons between disciplines. Notes and quotations from articles were recorded. Study characteristics were placed in table format for further analysis and comparison.

Surrogate Terms and Related Concepts

Several terms were utilized in conjunction or interchangeably throughout the literature. This was important a priori information, as it facilitated a more inductive literature search. The most prevalent surrogate terms were stigma (Aldrich & Hackley, 2010; Bachman et al., 2008; Brochu et al., 2018; Budd et al., 2011; Davis & Sekula, 2018; Falker & Sledge, 2011; Jung, Luck-Sikorski, Wiemers, & Riedel-Heller, 2015; Kushner, Zeiss, Feinglass, & Yelen, 2014; Mold & Forbes, 2013; Phelan, 2018; Phelan, Burgess, et al., 2015; Sikorski et al., 2013; Tanneberger & Ciupitu-Plath, 2018) and prejudice (Aranda & McGreevy, 2014; Bachman et al., 2008; Barra & Singh Hernandez, 2018; Brochu et al., 2018; Latner, O'Brien, Durso, Brinkman, & MacDonald, 2008; Matharu et al., 2014; McGlone et al., 2018; Miller et al., 2013; Pervez & Ramonaledi, 2017; Phelan, 2018; Phelan, Burgess, et al., 2015; Wolf, 2010; Yildiz & Yalcinoz Baysal, 2018). This was observed predominately within nursing and medicine. Stigma itself had various conceptualizations depending on the analytical lens (Link & Phelan, 2001). An in-depth discussion on stigma is beyond the scope of this paper; however, it is recognized as a surrogate term throughout this analysis. Discrimination, (Barra & Singh Hernandez, 2018; Brochu et al.,

2018; Budd et al., 2011; Davis & Sekula, 2018; Phelan, 2018; Phelan, Burgess, et al., 2015; Tanneberger & Ciupitu-Plath, 2018), stereotyping, (Brochu et al., 2018; Chrisler & Barney, 2017; Hodgkinson et al., 2017) obesity bias, (Chin et al., 2017; Khandalavala, Rojanala, Geske, Koran-Scholl, & Guck, 2014; Wolf, 2010) fat-stigma, (Hales, de Vries, & Coombs, 2016; Vaillancourt & Moore, 2019) anti-obesity, (Aranda & McGreevy, 2014; Miller et al., 2013) anti-fat, (Meadows et al., 2017; Wise, Harris, & Olver, 2014) sizeism, (Chrisler & Barney, 2017) shame, (Aranda & McGreevy, 2014) and oppressive and marginalizing, (Aranda & McGreevy, 2014) were additional surrogate terms identified in the literature.

Attributes

Identification of a concept's attributes is the primary accomplishment of the concept analysis (Rodgers, 2000). Attributes of weight bias among HCPs included reports of negative attitudes, views, opinions, beliefs and thoughts based on patient weight (Aldrich & Hackley, 2010; Barra & Singh Hernandez, 2018; Berry, Berry, Myers, Reznicek, & Berry, 2018; Budd et al., 2011; Chin et al., 2017; Chrisler & Barney, 2017; Davis & Sekula, 2018; Falker & Sledge, 2011; Gudzune, Beach, Roter, & Cooper, 2013; Hodgkinson et al., 2017; Jung et al., 2015; Kushner et al., 2014; Lee & Calamaro, 2012; McGlone et al., 2018; Meadows et al., 2017; Mold & Forbes, 2013; Pearl, Argueso, & Wadden, 2017; Pervez & Ramonaledi, 2017; Pfeiffer, 2018; Phelan, Burgess, et al., 2015; Robstad, Siebler, Söderhamn, Westergren, & Fegran, 2018; Robstad, Söderhamn, & Fegran, 2018; Seymour, Barnes, Schumacher, & Vollmer, 2018; Swift, Hanlon, El-Redy, Puhl, & Glazebrook, 2013; Vaillancourt & Moore, 2019; Wise et al., 2014; Wolf, 2010; Yildiz & Yalcinoz Baysal, 2018). The negative attitudes were often based on

stereotypes of obesity (Seymour et al., 2018). Furthermore, authors extended this attribute to include unfair or unequal treatment of patients with obesity (Brochu et al., 2018; Latner et al., 2008). Additional attributes of weight bias among HCPs included explicit and implicit attitudes (Brochu et al., 2018; Matharu et al., 2014; Miller et al., 2013; Mold & Forbes, 2013; Phelan, Burgess, et al., 2015; Phelan, Puhl, et al., 2015; Robstad, Siebler, et al., 2018; Vallis, Currie, Lawlor, & Ransom, 2007). Explicit bias is defined as a conscious awareness of one's bias while implicit bias runs on an unconscious level or is automatic (see Table 3.1).

Table 3.1

Attributes of Weight Bias Among Healthcare Providers

Attribute	**Supporting references**
Negative attitudes	Aldrich et al. (2010), Barra et al. (2018), Berry et al. (2018), Chin et al. (2017), Chrisler et al. (2017), Davis et al. (2018), Falker et al. (2011), Gudzune et al. (2013), Hodgkinson et al. (2017), Jung et al. (2015), McGlone et al. (2018), Meadows et al. (2017), Pearl et al. (2107), Pervez et al. (2017), Pfeiffer (2017), Phelan (2018), Robstad, Siebler et al. (2018), Robstad, Soderhamn et al. (2018), Swift et al. (2013), Wise et al. (2014), Wolf (2010), Yildiz et al. (2018)
Negative views	Lee et al. (2012)
Negative opinions	Barra et al. (2018)
Negative beliefs	Kushner et al. (2014), Sogg et al. (2018)
Negative thoughts	Budd et al. (2011)
Implicit attitudes	Brochu et al. (2018), Matharu et al. (2014), Miller et al. (2013), Mold et al. (2013), Phelan, Burgess et al. (2015), Phelan, Puhl et al. (2015), Robstad, Siebler et al. (2018), Vallis et al. (2007)
Explicit attitudes	Brochu et al. (2018), Matharu et al. (2014), Miller et al. (2013), Phelan, Burgess et al. (2015), Phelan, Puhl et al. (2015), Robstad, Siebler et al. (2018)

Measuring weight bias through self-report surveys or observations quantifies bias among HCPs. Several researchers from the articles selected for this analysis explored these measures which included: Anti-Fat Attitudes Test (AFAT; Lewis, Cash, Jacobi, & Bubb-Lewis, 1997), Anti-Fat Attitudes Questionnaire (AFAQ; Crandall, 1994), Beliefs About Obese Persons (BAOP; Allison, Basile, & Yuker, 1991), Fat Phobia (Bacon, Scheltema, & Robinson, 2001), and the Fat-Thin Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). A majority of the quantitative studies that used these instruments originated from medicine and psychology (Barra & Singh Hernandez, 2018; Khandalavala et al., 2014; Matharu et al., 2014; Meadows et al., 2017; Miller et al., 2013; Pearl et al., 2017; Phelan, Puhl, et al., 2015; Robstad, Siebler, et al., 2018; Seymour et al., 2018; Sikorski et al., 2013; Swift et al., 2013; Tanneberger & Ciupitu-Plath, 2018; Vallis et al., 2007; Wise et al., 2014; Wolf, 2010; Yildiz & Yalcinoz Baysal, 2018). The presentation of case studies or vignettes to study participant bias was predominately seen in nursing studies (Barra & Singh Hernandez, 2018; Pearl et al., 2017; Pfeiffer, 2018; Robstad, Siebler, et al., 2018; Seymour et al., 2018; Sikorski et al., 2013). Using these tools as reliable measures of bias allowed researchers to compare participants' baseline and post-intervention results after educational interventions. This was a critical component in their evaluation of the intervention.

Antecedents

The next step in the evolutionary method is the identification of antecedents. Antecedents are events or phenomena that are found to precede an instance of the concept (Rodgers, 1989).

Antecedents for weight bias were viewed from individual and situational dimensions (see Table 3.2).

Table 3.2

Antecedents of Weight Bias Among Healthcare Providers

Antecedent	**Supporting references**
Individual	
➢ Age	Budd et al. (2011), Meadows et al. (2017), Sikorski et al. (2013), Wise et al. (2014), McGlone et al. (2018),
➢ Gender	Meadows et al. (2017), Miller et al. ((2013), Pearl et al. (2017), Phelan, Puhl et al. (2015), Yildiz et al. (2018)
➢ Personal BMI	Aranda et al. (2014), Berry et al. (2018), Latner et al. (2008), Meadows et al. (2017), Pearl et al. (2017), Swift et al. (2013), Yildiz et al. (2018)
Situational	
➢ Blame, controllability	Chin et al. (2017), Davis et al. (2018), Hodgkinson et al. (2017), Jung et al. (2015), Meadows et al (2017), Pervez et al. ((2017), Phelan (2018), Robstad, Soderhamn et al. (2018), Sikorski et al. (2013), Swift et al. (2013), Tanneberger et al. (2018), Vaillancourt et al. (2019), Wise et al. (2014)
➢ Lack competence	Lee et al. (2012), Kirk et al. (2014), Robstad, Soderhamn et al. (2018), Hales et al. (2016)
➢ Contact time	Phelan, Puhl et al. (2015)
➢ Lack of resources	Mold et al. (2013), Robstad, Soderhamn et al. (2018), Tanneberger et al. (2018)
➢ Practice time	Khandalavala et al. (2014), Sikorski et al. (2013)
➢ Role modeling	Phelan, Puhl et al. (2015), Pervez et al. (2017)

Individual Dimension

Individual characteristics such as gender, age, and personal BMI played a role in weight bias among HCPs. Male HCPs often times reported more negative attitudes or anti-fat bias than females (Meadows et al., 2017; Miller et al., 2013; Pearl et al., 2017; Phelan, Puhl, et al., 2015;

Yildiz & Yalcinoz Baysal, 2018). Additionally, the influence of the HCP's age on weight bias was discussed. Younger medical students and HCPs (age not specified across studies) exhibited more bias than older medical students and HCPs (Budd et al., 2011; Meadows et al., 2017; Wise et al., 2014). McGlone and colleagues (2018) found younger primary care physicians in the United Kingdom (U.K.) were more likely to have negative attitudes towards publicly funding bariatric surgery. Alternatively, as age increased among German HCPs the level of stigmatizing attitudes toward female patients with obesity increased (Sikorski et al., 2013).

A HCP's personal BMI was assessed by many studies as a predictor variable that could influence HCP practice patterns (Aranda & McGreevy, 2014; Berry et al., 2018; Latner et al., 2008; Meadows et al., 2017; Swift et al., 2013; Yildiz & Yalcinoz Baysal, 2018). In comparison to other marginalized groups where a member of the group reports lower bias against a member of the same group, higher BMI was not associated with a decrease in weight bias toward other individuals with obesity (Latner et al., 2008). For example, Berry et al. (2018) aimed to assess obesity documentation patterns among physicians and found physicians with BMIs greater than 30 kg/m^2 were less likely to document obesity in the patient's chart. This was consistent with self-report data among healthcare-related students that showed as height, weight, and BMI increased, obesity prejudice scores increased (Yildiz & Yalcinoz Baysal, 2018). In contrast to this, medical students with a higher BMI reported less negative attitudes toward patients with obesity (Meadows et al., 2017). Swift et al (2013) also found higher self-reported BMI among students from nursing, medicine, nutrition, and dietetics predicted lower fat phobia attitudes. Notably, the HCP's personal success with weight loss was also a factor. In an online survey that assessed weight bias with the use of patient vignettes, medical students and residents who had

personally lost weight and successfully maintained their weight loss reported less compassion overall and significantly more blame toward a patient who was described as having lost weight but regained it (Pearl et al., 2017).

Situational Dimensions

The situational antecedents to weight bias included societal norms and professional norms.

Societal norms. The most prevalent antecedent to weight bias among HCPs was blame coupled with the belief in the controllability of weight. Several studies examined the role of attributing blame or lack of willpower (Davis & Sekula, 2018; Meadows et al., 2017; Phelan, 2018; Sikorski et al., 2013; Swift et al., 2013; Tanneberger & Ciupitu-Plath, 2018; Vaillancourt & Moore, 2019; Wise et al., 2014). Medical students in one study believed that obesity may be a behavioral issue and that patients could lose weight if they were motivated (Chin et al., 2017). Some nurses blamed patients with obesity, citing poor lifestyle choices, lack of willpower or motivation (Pervez & Ramonaledi, 2017; Robstad, Söderhamn, et al., 2018; Tanneberger & Ciupitu-Plath, 2018). In one qualitative study of midwives in the U.K., midwives characterized pregnant women with a raised BMI as ‘less health conscious’ and ‘complacent’ (Hodgkinson et al., 2017). Jung et al. (2015) found that nutritionists and dieticians reported their negative attitudes and beliefs about obesity were rooted in internal factors such overeating or lack of willpower rather than genetic factors or biology.

Professional norms. The antecedent professional norms included the variables of contact time, lack of resources, practice time, and role modeling. The amount of time, specifically the amount of positive contact time was associated with implicit and explicit biases (Phelan, Puhl, et al., 2015). The perception of a lack of resources preceded negatives attitudes (Robstad,

Söderhamn, et al., 2018). Consistent with these findings, Mold and Forbes (2013) found HCP's attitudes regarding the amount of time, lack of appropriate equipment, or coordination of care may limit their ability to care for patients with obesity. Among acute care nurses, concerns regarding appropriate staffing ratios for the care of patients with obesity were reported (Tanneberger & Ciupitu-Plath, 2018). More specifically, the authors found a significant association between a poor rating of staffing ratios and the nurses perceived personal discrimination of patients with obesity (Tanneberger & Ciupitu-Plath, 2018).

The amount of the HCP's time in practice was examined along with the level of bias toward people with obesity (Khandalavala et al., 2014; Sikorski et al., 2013). Khandalavala and colleagues (2014) showed that more experienced primary care providers in the United States (U.S.) reported greater bias than less experienced providers. However, among German HCPs, more work experience was associated with less negative views (Sikorski et al., 2013). This may play a part in the HCP's role modeling behavior. Weight bias can be disseminated by poor role modeling. Students within healthcare disciplines may be particularly susceptible. Medical students reported increased implicit and explicit biases with more exposure to faculty who made negative comments or displayed discriminatory behavior toward patients with obesity (Phelan, Puhl, et al., 2015). Similarly, nursing students who witness nurses discriminating against patients with obesity may reinforce negative perceptions and encourage students to continue such behavior (Pervez & Ramonaledi, 2017).

Consequences

Consequences, or situations that follow an occurrence of the concept were readily identifiable in the literature (Rodgers, 1989). These consequences can be further segmented into two outcome categories: relational and health outcomes (see Table 3.3).

Table 3.3

Consequences of Weight Bias Among Healthcare Providers

Consequences	**Supporting references**
Relational outcomes	
➢ Omit the topic of obesity	Berry et al. (2018), Mold et al. (2013), Pervez et al (2017), Thille (2018)
➢ Anti-obesity discourse	Aranda et al. (2014), Phelan, Burgess et al. (2015), Seymour et al. (2018), Sogg et al. (2018)
➢ Medical fat shaming	Chrisler et al. (2017)
➢ Less emotional rapport	Barra et al. (2018), Gudzune et al. (2013)
Health outcomes	
➢ Impact clinical decisions, willingness to provide care	Aldrich et al. (2010), Bachman et al. (2008), Chrisler et al. (2017), Davis et al. (2018), Hodgkinson et al. (2017), Mold et al. (2013), Phelan, Burgess et al. (2015), Robstad, Siebler et al. (2018), Vaillancourt et al. (2019)
➢ Refer to surgery/structural stigma	McGlone et al. (2018), Phelan (2018)
➢ No effect on care	Budd et al. (2011), Pfeiffer (2017), Seymour et al. (2018)

Relational outcomes. Weight bias among HCPs may result in the HCPs reluctance to discuss the topic of weight or obesity with patients (Mold & Forbes, 2013; Pervez & Ramonaledi, 2017; Thille, 2018). Comparing the overall documentation rate of two chronic medical diseases, obesity versus hypertension, the documentation rate of an obesity diagnosis

was significantly different than a diagnosis of hypertension (Berry et al., 2018). Specifically, during the interpretation and review of blood pressure checks and weight, providers routinely discussed the blood pressure results and rarely interpreted weight (Thille, 2018). Avoiding the discussion of weight loss with patients prevented them from receiving needed support and empowerment (Pervez & Ramonaledi, 2017). On the other hand, anti-obesity discourse resulted in negative communications (Aranda & McGreevy, 2014). The language of anti-obesity discourse can communicate a lack of respect or empathy to a patient with obesity (Phelan, Burgess, et al., 2015; Sogg, Grupski, & Dixon, 2018). Using patient scenarios, HCPs with high weight bias were less likely to use patient-centered discourse with patients with obesity (Seymour et al., 2018). Words such as "education" and "encourage" were more common in conversations with an individual of normal weight (Seymour et al., 2018). As defined by Chrisler and Barney (2017), medical fat shaming is when the HCP deliberately embarrasses their patient with obesity in an attempt to motivate the patient to alter their behavior. Receptiveness of patients, judgment, and quality of communication can be affected when this approach is used (Barra & Singh Hernandez, 2018). Through the examination of audio-recorded outpatient visits, physicians demonstrated significantly less emotional rapport with patients who were overweight

Health outcomes. Weight bias among HCPs may ultimately lead to poor health outcomes for the patient. HCPs who base their practice on patient weight may alter their clinical decisions or willingness to deliver appropriate care to patients with obesity (Mold & Forbes, 2013; Phelan, Burgess, et al., 2015). Studies indicated that physicians frequently blamed a problem or patient complaint on weight rather than investigate the issue (Bachman et al., 2008; Chrisler & Barney, 2017; Phelan, Burgess, et al., 2015). Self-reported anti-obesity beliefs and

stereotypes among ICU nurses were negatively associated with their intention to immediately help the patient with obesity (Robstad, Siebler, et al., 2018). Structural stigma is the view by providers and facilities that bariatric surgery is the easy way out or for weak patients and whereby providers believe they should control access to surgery (Phelan, 2018). Weight bias may result in low referral rates for bariatric surgery (McGlone et al., 2018).

Women's healthcare, specifically was impacted by weight bias (Aldrich & Hackley, 2010; Davis & Sekula, 2018; Hodgkinson et al., 2017; Vaillancourt & Moore, 2019). Women with obesity were less likely to have a recent Papanicolaou test (Aldrich & Hackley, 2010). As a woman's body weight increased, the likelihood of having a recent mammogram decreased (Aldrich & Hackley, 2010). Weight bias toward sexual-assault victims who were overweight or obese may result in further stigmatization during the forensic examination because of the HCP's attitudes and/or ill-fitted equipment (Davis & Sekula, 2018). HCPs who are not sensitive to the needs of patients with obesity may not have the awareness to order proper equipment and resources which could result in lower quality of care (Falker & Sledge, 2011).

Despite the evidence that showed care was negatively impacted by weight bias, there were a few studies that were outliers. In one experimental study, nurses were asked to make care decisions based on photos and case vignettes (Pfeiffer, 2018). Although nurses reported negative attitudes toward higher weight patients, measurements of care such as time spent with patient, communication, and walk assistance did not differ from normal weight patients. Seymour et al. (2018) found that HCPs with high and low weight bias offered identical recommendations for diet and exercise among patients with obesity and normal weight patients. Additionally, a

literature review by Budd et al. (2011) determined HCPs' bias attitudes did not affect care delivery.

Exemplar Case

The exemplar case is identified, not constructed, from the literature and used in order to provide an illustration of the concept in a relevant context (Rodgers, 2000). Three brief cases are presented. The following exemplar illustrated the HCP's negative beliefs about patients with obesity and how these beliefs translated to frustration with caring for the patient. One nurse disclosed (Robstad, Söderhamn, et al., 2018),

> this is what I am struggling with mentally. The thing that you have to work and struggle with a patient for weeks or maybe months and they do not care or bother to take care [of themselves] . . . I think this is a challenge. I get irritated because I have to struggle. (p. 391)

The next exemplar demonstrated how the HCP's anti-obesity discourse may weaken the patient-provider relationship (Thille, 2018),

> The physician retrieves and reads aloud a dietician's report, asking the patient if she has followed the dietician's written recommendations. The physician then implies that a lack of honesty may be the culprit. . . people that track consistently really (.) do have better outcomes and then honestly tracking, like some people conveniently forget to put down their. . . big dessert. (p. 7)

Aranda and McGreevy (2014) described the experience of overweight nurses interacting with overweight patients. The exemplar case highlighted the antecedents of the HCP's personal BMI, age, and practice time.

> When I was slim I suppose I had very little tolerance of overweight, I wasn't as sympathetic as I am now...And also it was easier, it's easier when I was in my early twenties to maintain my weight, whereas metabolism changes, you know, your shape changes after you've had babies and it's just not as easy...I thought why aren't you doing something to lose the weight. Whereas now, I definitely feel sympathy. . . (p. 33)

Implications

As early as 1968, researchers have studied the prevalence of negative attitudes toward obesity within society (Maddox, Back, & Liederman, 1968). Kalisch (1972) identified nurses as leaders to destigmatize obesity and to work with other healthcare professionals and the public to develop accepting attitudes toward persons with obesity. Notwithstanding, weight bias among healthcare providers is still present. Based on the literature retrieved for this analysis, weight bias is receiving increasing attention from researchers and practitioners. The attributes of weight bias have undergone little variation. The frequent use of surrogate terms may negatively impact a complete analysis of the concept. However, the pattern of increased investigation leads this author to acknowledge that this multidimensional concept must be further developed beyond the boundaries of a few select disciplines in order to raise awareness of weight bias and decrease the stigmatization of persons with obesity.

Concept analyses contribute to the continuing development of nursing knowledge and analysis of the common use of a concept facilitates its definition and clarification (Rodgers, 1989). According to this review of the concept, weight bias among healthcare providers can be explained as *conscious or unconscious negative behavior by the healthcare provider that elicits*

distress from the patient with obesity and potentially effects patient care and healthcare outcomes.

An interdisciplinary comparison among nursing, medicine, psychology, and other health-related fields revealed differences among each of the disciplines from a theoretical perspective. This was evident in each discipline's chosen methodology and measure of weight bias. However, more commonalities were found within the data with respect to assessing for and decreasing weight bias among healthcare providers. The concept of self-awareness of bias was identified as an important phenomenon for this analysis. Several studies across all disciplines discussed the first step in reducing bias was to become aware of one's own bias (Falker & Sledge, 2011; Latner et al., 2008; Lee & Calamaro, 2012; Miller et al., 2013; Vallis et al., 2007; Wolf, 2010). Healthcare providers who are aware of their bias can increase their sensitivity to the needs of patients with obesity which could result in equality of care (Falker & Sledge, 2011).

Future developments in education and training to decrease the prevalence of weight bias among healthcare providers were discussed throughout the literature (Barra & Singh Hernandez, 2018; Falker & Sledge, 2011). Strategies to decrease weight bias include continuing education and curriculum changes (Phelan, Puhl, et al., 2015). A majority of the nursing literature called for sensitivity training to include communication, causes of obesity, and development of tools to help decrease stigma (Bachman et al., 2008; Barra & Singh Hernandez, 2018; Budd et al., 2011). The non-nursing literature proposed curriculum changes within their educational institutions which would train students before entering practice with positive experiences and role modeling from instructors (Kushner et al., 2014; Miller et al., 2013; Phelan, Puhl, et al., 2015; Swift et al., 2013). Meadows and colleagues (2017) reported the improvement in medical students' attitude

toward patients with obesity after positive experiences during school. An interventional study among medical students demonstrated that encounters with overweight standardized patients was associated with increased confidence, decreased stereotyping, and increased empathy (Kushner et al., 2014).

Conclusion

This analysis provides an appreciation for the complexity and multi-dimensionality of the concept of weight bias among healthcare providers. Understanding the meaning and use of the concept of weight bias could facilitate the development of appropriate education and training for health professionals. In line with the evolutionary method of concept analysis, the results may be applied to practice and further evaluated as inquiry should be an ongoing occurrence (Rodgers, 2000). The data presented through this concept analysis helps identify the perspectives of the healthcare providers with respect to weight bias and gives direction for educational interventions that aim to increase awareness and decrease the stigma of obesity.

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CHAPTER 4:
WEIGHT MANAGEMENT PRACTICES AMONG PRIMARY CARE NURSE PRACTITIONERS IN FLORIDA: A CROSS-SECTIONAL STUDY

Abstract

The aim of this study was to examine primary care nurse practitioners' (NPs') perceptions and practice patterns of weight management and explore factors that may influence the implementation of weight management practices in primary care. Florida primary care NPs (n=312) completed an online questionnaire. A stepwise linear regression model identified that self-efficacy and perceived skill accounted for 43.6% of weight management practice variance ($p < .001$). The results of the survey will contribute to the development of provider resources and strategies that enhance self-efficacy and perceived skill which will ultimately lead to better health outcomes for people with obesity.

Keywords: primary care nurse practitioners, self-efficacy, obesity, weight management practices

Introduction

Obesity rates have been trending upwards for over four decades (National Center for Health Statistics, 2017). Recent National Health and Nutrition Examination Survey (NHANES) data showed the prevalence of obesity among adults over the age of 20 years old at almost 40% (Hales, Carroll, Fryar, & Ogden, 2017). The health consequences of obesity extend beyond cardiovascular health risks to include type 2 diabetes, cancer, mental health sequelae, fertility issues, and decreased quality of life (Centers for Disease Control and Prevention [CDC], 2018; Sundaram, Mumford, & Buck Louis, 2017). Annual medical care costs (in 2010 dollars)

associated with obesity totaled $315.8 billion with substantially more healthcare dollars related to higher body mass index (BMI) classifications (Cawley, Meyerhoefer, Biener, Hammer, & Wintfeld, 2015). Body mass index ranges and the corresponding obesity classes are detailed in Table 4.1 (CDC, 2016). Obesity's impact on society's mental and physical well-being and healthcare costs requires deeper understanding about how health care providers are dealing with this public health crisis.

Table 4.1

Classification of Overweight and Obesity

	BMI (kg/m^2)	Obesity class
Underweight	< 18.5	
Normal	18.5–24.9	
Overweight	25.0–29.9	
Obese	30.0–34.9	I
	35.0–39.9	II
Extreme Obesity	> 40	III

Note: BMI = Body Mass Index; kg = kilograms; m^2 = meters squared

Numerous organizations including the American Heart Association/American College of Cardiology/The Obesity Society (Jensen et al., 2013), the Association of Clinical Endocrinologist/American College of Endocrinology (Garvey et al., 2016) and the Endocrine Society (Apovian et al., 2015) have published weight management guidelines. These guidelines uniformly recommend providers screen, identify, diagnose and formulate an individualized treatment plan that includes diet, exercise, behavior modifications and pharmacological or surgical interventions for select patients. However, research has shown that primary care providers may still lack the knowledge and skills to effectively and consistently recognize,

diagnose, and treat obesity in primary care (Antognoli et al., 2014; Bleich, Pickett-Blakely, & Cooper, 2011).

Nurse practitioners (NPs) play a critical and expanding role in primary care settings. They provide care to millions of Americans and have delivered an estimated 1.02 billion annual patient visits (American Association of Nurse Practitioners [AANP], 2018). Yet, one study reported only 42% of overweight and obese patients were told by their provider that they were overweight or obese (Ahn, Smith, & Ory, 2012). Courtney et al. (2010) reported that the majority of NPs assess and discuss weight loss goals with patients but rarely prescribe weight loss pharmaceuticals or make referrals for bariatric surgery. In a retrospective chart review, NPs were initiating weight loss interventions 61% of the time versus physicians' rate of 7.8% (Magee, Everts, & Jamison, 2012). Recent self-report survey data of physicians and NPs showed their practice patterns were inconsistent with current clinical guidelines, and that they delayed medical intervention or referral until higher BMIs were reached (Granara & Laurent, 2017; Petrin, Kahan, Turner, Gallagher, & Dietz, 2016; Turner, Jannah, Kahan, Gallagher, & Dietz, 2018). However, the literature shows that there are a limited number of studies that focus specifically on NPs and their approach to achieving weight loss through interventions such as a comprehensive lifestyle change program (Hyer, 2019).

There are several variables that may influence NPs' weight management practices. These include perceived barriers, attitudes toward patients with obesity, self-efficacy and perceived skill. Lack of time, training, confidence, and reimbursement are frequently cited as barriers to weight counselling (Briscoe & Berry, 2009; Simon & Lahiri, 2018). Additionally, lack of resources or tools were also reported (Schauer, Woodruff, Hotz, & Kegler, 2014; Steglitz,

Sommers, Talen, Thornton, & Spring, 2015). Negative attitudes or weight bias are present among some healthcare providers (Puhl & Heuer, 2009). Consequently, these attitudes may interfere with care and therefore negatively impact patient outcomes (Phelan et al., 2015). The literature suggests that as few as 19% of patients with obesity reported that their healthcare provider initiated a conversation regarding their weight status (Rueda-Clausen et al., 2014). Provider self-efficacy may influence the initiation of counseling and weight management. Zhu and colleagues (2013) demonstrated a significant correlation between self-efficacy, perceived skill and weight management practices. More data is needed on the perceptions and practices of NPs who manage obesity in primary care.

According to a health-system data analysis, Florida's adult obesity rate is 37% (Filipp et al., 2018). The growing prevalence of obesity in Florida is consistent with the upward trend observed nationally. In 2015, total health care expenditures in Florida were almost $174 billion (Agency for Health Care Administration, State of Florida, 2015) of which nearly 6% were associated with obesity costs (Biener, Cawley, & Meyerhoefer, 2018). This relatively low amount of expenditure associated with obesity may be accounted for, among other factors, by the differences in how providers treat obesity (Biener et al., 2018). Florida primary care NPs are in a position to intervene and impact current obesity statistics.

Theoretical Framework

The framework for this study was based on the Health Promotion Model (HPM; Pender, Murdaugh, & Parsons, 2002). The theory proposes that individual characteristics and experiences along with behavior-specific cognitions and affect motivate an individual's health-promoting

behavior. This study drew on the constructs and definitions from the HPM including individual characteristics (prior related behavior and personal factor), behavior-specific cognitions (perceived barriers, perceived self-efficacy), and the behavioral outcome. It was hypothesized that factors such as previous experience, education, demographic variables, attitude toward persons with obesity, perceived barriers, and perceived self-efficacy would predict the NP's health promoting behavior evidenced by their reported weight management practices.

Purpose

This study aimed to describe primary care NPs' weight management practice patterns and examine the relationship among attitudes, perceived barriers, self-efficacy, perceived skill, demographic characteristics and the implementation of weight management practices. The three research questions were: What are current weight management practices among NPs in primary care settings? To what extent do attitudes toward patients with obesity, self-efficacy, and perceived barriers influence weight management practices among NPs? What is the relationship between the NP's weight management practices and their age, ethnicity, race, personal BMI, perceived weight status, education, time in practice, and continuing education on obesity?

Methods

A cross-sectional survey design was used to measure attitudes, perceptions, and practice patterns among primary care NPs in Florida via an online survey. This study was approved by the institutional review board of the University of Central Florida.

Sample

The study participants were primary care NPs in the state of Florida. Licensed NPs whose clinical practice involved managing the care for adult patients with obesity in primary care settings and who had a valid email address were included in the survey. Exclusion criteria included non-NP registered nurses, inactive NPs, or NPs not currently practicing in a primary care setting that serves an adult patient population. Systematic sampling was used to select participants from the Florida Department of Health's (2018) public data portal of practitioners who had an email address. Systematic sampling selects every *k* th case from a list by establishing a sampling interval, the distance between sampled cases (Polit & Beck, 2017). In this study, *k* was determined by dividing the desired sample size (n=10,000) by the population of NPs with an email address (N=28,535), or every second case. Utilizing a random starting point function, 10,000 cases were selected from the list that had no particular arrangement. A power analysis was completed through SAS (version 9.4). The program calculated a total required sample size of 199 participants for a multiple linear regression model based on 0.05 significance level, moderate effect size (0.5) and a power of .80.

Instrument

The King's Perceptions Relating to Nutrition, Exercise, and Body Weight: A Nurse's Perspective (KNEWQ; Zhu et al., 2013) is a self-administered questionnaire developed to measure factors underpinning weight management practices. The 61-item instrument is comprised of five scales: attitudes toward obese persons (ATOP); attitudes toward weight management (ATWM) comprised of three subscales including professional role identity [PRI],

teamwork beliefs [TWB], and self-efficacy [SE]); weight management practices (WMP); perceived barriers (PB); and perceived skills (PS). The scale is summarized in Table 4.2.

The ATOP is a 20-item scale that measures attitudes toward people with obesity. It is formatted with a 6-point Likert scale ranging from strongly agree to strongly disagree. Higher scores are indicative of more positive attitudes. Zhu et al. (2013) reported the Cronbach's α was 0.81.

The ATWM is a 17-item scale, comprised of three subscales SE (8 items), PRI (4 items), and TWB (5 items) that measure perceptions related to nurses managing patients with obesity. It is formatted with a 6-point Likert scale ranging from strongly agree to strongly disagree. Zhu et al. (2013) reported the Cronbach's α was 0.85 for the whole scale and the three subscales 0.82, 0.80, and .73, respectively.

Table 4.2

King's Perceptions Relating to Nutrition, Exercise, and Body Weight: A Nurse's Perspective Scale

				Range	
Scale	Items	α	M±SD	Actual	Potential
Attitudes Toward Obese Persons	20	0.83	67.5±16.7	14-112	0-120
ATWM-Self-efficacy	8	0.80	38.5±6.0	14-48	8-48
ATWM-Teamwork Beliefs	5	0.65	27.6±2.9	7-30	5-30
ATWM- Professional Role Identity	4	0.67	22.5±2.1	14-24	4-24
Weight Management Practices	8	0.86	28.5±6.9	8-40	8-40
Perceived Barriers	9	0.77	35.5±7.9	15-54	9-54
Perceived Skills	7	0.86	16.5±3.4	7-21	7-21

Note: M = mean; SD = Standard Deviation; ATWM = Attitude Toward Weight Management

The WMP is an eight-item scale that measures the percentage of patients who receive clinical services such as assessing BMI, waist circumference, counseling services, or referrals. The 5-point Likert scale uses the following options: 0%, 1-25%, 26-50%, 51-75%, and >75%. Zhu et al. (2013) reported the Cronbach's α was 0.86.

The PB is a nine-item scale that measures commonly reported barriers to weight management. It is formatted with a 6-point Likert scale ranging from strongly agree to strongly disagree. Zhu et al. (2013) reported the Cronbach's α was 0.81.

The PS is a seven-item scale that measures the reported skills for the prevention and treatment of overweight and obesity. The item responses include low level, moderate level, and high level. The Cronbach's α was 0.83 as reported by Zhu and colleagues (2013).

Demographic information (age, gender, ethnicity, race, height, and weight) was collected and included questions regarding continuing education related to obesity, time in practice, practice location, and perceived personal weight status. Strong psychometric data for the KNEWQ has been reported among British nurses (Zhu et al., 2013). The current study is believed to be the first to use the instrument within the United States (U.S.) and among NPs. Three U.S. primary care NPs assessed the online version of the tool for question flow, sequencing of demographic questions, and the amount of time required to answer the questionnaire. Permission to use the instrument was granted by the authors.

Data Collection

The paper-based KNEWQ questionnaire was uploaded by the investigator and distributed through Qualtrics® as an online survey. A pre-notification email explaining the purpose of the

study preceded the invitation to participate in order to strengthen recruitment (Saleh & Bista, 2017). The survey invitation included the purpose of the study, survey length, stated that participation was voluntary and confidential, and included a link to the survey. Participants could elect to participate based on the stated inclusion and exclusion criteria. A two-stage recruitment process was necessary to meet the estimated sample size requirements within the targeted study time period. The survey was distributed electronically to approximately 10,000 NPs within the state of Florida with an initial response of 172 surveys. Another wave of invitations was subsequently sent to a second group of approximately 10,000 NPs. In total, 312 surveys were completed.

Data Analysis

Data from Qualtrics® was exported to an Excel spreadsheet and thereafter was imported into SPSS Statistics, version 24 (IBM Corp., Armonk, N.Y., USA). Data was assessed for irregularities and missing data. Surveys with greater than 10% missing data were excluded (Duffy & Brewer, 2011). Examining missing data for each scale within the instrument, there was less than 3% missing data for ATWM, WMP, PB, and PS scales. The ATOP scale had less than 5% missing data. Case mean substitution was used to impute missing data (Fox-Wasylyshyn & El-Masri, 2005). Descriptive statistics were performed on all variables. Pearson's correlation was used to assess relationships between variables. Two separate stepwise multiple regression models were used to identify factors associated with NPs' weight management practices.

Results

The overall response rate was 1.6% which exceeded the power requirement of 199 participants. A summary of participants' characteristics is provided in Table 4.3. Not all participants answered all demographic questions. NPs who reported demographic information had a mean age (SD) of 50 (12) years, the majority were female (89.5%), white (86%), non-Hispanic (86%) and had less than 10 years of experience (52.8%). Approximately 20% had a doctoral degree. Half of the participants completed continuing education courses for weight management, with 49% of them attending eight or more hours of training. A calculated BMI, based on self-reported height and weight, showed most NPs were normal to overweight. Calculated BMI and perceived weight status were negatively correlated with WMP (r = -.137, p= .01; r = -.110, p=.032) indicating that as BMI and perceived weight increased, WMP decreased.

Table 4.2 shows the participants' mean score with SD, range for scale scores, and Cronbach's α concerning attitudes, perceptions, and practice patterns of weight management. Most NPs reported practicing a moderate level of weight management activities with patients. Over three-quarters (80%) of NPs indicated that they complete a BMI assessment greater than 75% of the time. However, more than half (52%) never measure waist circumference. Nearly half (49%) of the NPs give general lifestyle advice about weight management and provide emotional support greater than 75% of the time. Giving advice on diets, physical activity, and referrals to other healthcare professionals was inconsistent.

Table 4.3

Sample Characteristics

Characteristics[a]	Mean±SD or n (%)
Age (years)	50±12
Gender, female	274 (89.5)
Race/Ethnicity	
American Indian/Alaska Native	2 (0.7)
Asian	9 (3.0)
Black or African American	28 (9.3)
Native Hawaiian or other Pacific Islander	1 (0.3)
White	262 (86.8)
Hispanic	41 (13.4)
BMI	26.5±5.4
Perceived weight status	
Underweight	4 (1.3)
Normal	142 (46.6)
Overweight	128 (42.0)
Obese	31 (10.2)
Education	
PhD	10 (3.3)
DNP	52 (17.0)
Master's	229 (74.8)
CE for weight management (yes)	155 (49.7)
Hours of training	
0-2	21 (13.5)
3-8	58 (37.4)
> 8	76 (49.0)
Years of practice	11.3±10.2
< 10	160 (52.8)
10-24	110 (36.3)
≥ 25	33 (10.9)

Characteristics[a]	Mean±SD or n (%)
Practice location	
Urban	182 (60.1)
Urban cluster	75 (24.8)
Rural	46 (14.7)

Note. [a]Not all participants completed all items. M = mean; SD = Standard Deviation; BMI = Body Mass Index; PhD = Doctor of Philosophy; DNP = Doctor of Nurse Practice; CE = Continuing Education

Mean ATOP scores suggest an overall positive attitude toward people with obesity. The mean scores of the ATWM subscales reflects a moderately high level of self-efficacy and high levels of teamwork beliefs and professional role identity. The majority of NPs moderately to strongly agreed that lack of time, lack of patient interest, and complexity of patient comorbidities prevented weight management promotion. Inadequate training, insufficient compensation, and absence of clear practice guidelines and tools were also reported barriers to weight management. Perceived skills in weight management were moderate among surveyed NPs with assessment of the degree of overweight and modification of sedentary behavior rated highest among participants.

Significant correlations were found between study variables (Table 4.4). Most variables were significantly correlated with each other. SE and PS were positively correlated with each other in addition to TWB, PRI, and WMP. ATOP, SE and PS were negatively correlated with PB.

Table 4.4

Correlational Matrix of Study Variables

	ATOP	SE	TWB	PRI	WMP	PB	PS
ATOP	1						
SE	.047	1					
TWB	.063	.365**	1				
PRI	.033	.345**	.393**	1			
WMP	.087	.608**	.169**	.206**	1		
PB	-.132*	-.220**	.033	.024	-.264**	1	
PS	-.004	.540**	.153**	.250**	.551**	-.310**	1

ATOP = Attitudes Toward Obese Persons; SE = Self-efficacy; TWB = Teamwork Beliefs; PRI = Professional Role Identity; WMP = Weight Management Practices; PB = Perceived Barriers; PS = Perceived Skills. *p< .05 **p< .01

In stepwise regression, when ATOP, SE, PB, and PS were analyzed in the model, SE and PS were the strongest independent variables of WMP and accounted for 43.6% of the variance (p< .001; Tables 4.5 and 4.6). A second regression model was used to test the predictive relationship between WMP and practice and demographic data. This test revealed there was no significant predictive relationship between WMP and demographic data such as age, race, ethnicity, calculated BMI, or professional practice data (not shown).

Table 4.5

Model Summary for Weight Management Practices

Model	R	R^2	Adjusted R^2
1	.608[a]	.370	.368
2	.663[b]	.440	.436

a. Predictors: SE; b. Predictors: SE, PS

Table 4.6

Summary of Multiple Regression Analysis for Weight Management Practices

Variable	B	SE	β	□95% CI
Self-efficacy	.502	.058	.439***	[.388, .617]
Perceived Skill	.642	.104	.314***	[.439, .846]

***p < .001; CI = Confidence Interval; F(2, 309) = 121.26, p< .001

Discussion

The aim of this analysis was to examine primary care NPs' perceptions and practice patterns of weight management and explore factors that may influence the implementation of weight management practices in primary care. This study found that, in a group of Florida primary care NPs, higher self-efficacy and perceived skill accounted for a significant amount of the variance in their weight management practices with patients.

These results are similar to findings from previous data on weight management practices among NPs (Courtney & Dickson, 2010; Jarl, Tolentino, James, Clark, & Ryan, 2014; Petrin, Kahan, Turner, Gallagher, & Dietz, 2017; Tanda, Beverly, & Hughes, 2017). A majority of NPs completed a BMI assessment. However, waist circumference was rarely measured. Courtney et al. (2010) reported similar results for BMI calculations and waist circumference. Barriers to assessing waist circumference are similar to the barriers reported for implementing weight management practices in general, such as lack of time and discomfort for the provider and the patient (Gaynor, Habermann, & Wright, 2018). The results also revealed that nearly half of NPs give general lifestyle advice about weight management greater than 75% of the time. However, tailoring specific advice for diet and physical activity varied. This is consistent with other

healthcare providers' practices related to diet and physical activity (Bleich et al., 2011). Sargent and colleagues (2012) found that lifestyle interventions delivered by nurses in primary care translated to positive health outcomes. Nonetheless, if NPs are not knowledgeable or confident in the delivery of nutritional or physical activity advice then their practice patterns may reflect this (Buchholz & Purath, 2007; Kris-Etherton et al., 2014; Lamarche & Vallance, 2013). Most study participants indicated that they provide emotional support as part of their practice with patients. The NPs' awareness of a patient's emotional needs during weight counseling suggests a holistic approach. This finding is supported by previous research that highlighted NPs' sensitivity to non-clinical considerations when counseling patients with obesity (Petrin et al., 2017). Previous research has stressed the importance of communicating sensitively with patients in order to build a strong patient provider relationship (Koball et al., 2016; Leske, Strodl, & Hou, 2012). Lastly, referrals to other healthcare professionals were inconsistent. Given the recommendation to offer or refer patients for comprehensive lifestyle interventions (Jensen et al., 2013; LeBlanc et al., 2018) and the extensive literature on the barriers for primary care providers to counsel patients with obesity, referral to a specialist may be an effective strategy to overcome these challenges (Lewis & Gudzune, 2014). Lack of awareness of resources or lack of resources to which to refer patients reflects a larger, systemic issue within the healthcare system.

The present study expands upon the findings of previous research related to self-efficacy and clinical practice patterns (Hessler, 2015; Jay et al., 2009; Lamarche & Vallance, 2013; Quelly, 2014; Zhu et al., 2013). A majority of participants felt they could provide advice to their patients with obesity with respect to the cause of obesity and interventions that promote weight loss. The present study also showed that NPs' perceived skill level in assessing and modifying

patient lifestyle choices contributed to weight management activities. This is consistent with Zhu et al. (2013) findings that self-efficacy and perceived skills directly and positively influenced RN's weight management practices. Additionally, the Cronbach's α were consistent with previous use of the survey among RNs (Zhu et al., 2013).

Study participants reported a substantial amount of continuing education hours related to weight management. Previous research has shown a positive relationship between continuing education and self-efficacy (Bleich, Bandara, Bennett, Cooper, & Gudzune, 2015; Hessler, 2015) and between continuing education and weight management practices (Quelly, 2017; Zhu et al., 2013). Unlike previous research, this survey did not reveal a correlation between the level of education and weight management practices. Approximately 20% of participants reported a terminal degree. It is possible that due to the variability of obesity curricula within graduate nursing programs that the level of formal education does not influence the implementation of weight management practices in primary care (Rogge & Merrill, 2013; Sabol, 2012). This may demonstrate the need for more consistent curriculum among NPs programs that focuses on obesity and evidence-based weight management practices.

Perceived barriers toward weight management among primary care NPs was commensurate with previous research which cite the lack of time, lack of patient interest or readiness for change, training, and compensation (Petrin et al., 2016; Schlair, Moore, McMacken, & Jay, 2012; Timmerman, Reifsnider, & Allan, 2000). The complexity of patients with multiple comorbidities was reported as a major barrier. Since obesity is associated with cardiovascular risks and other comorbidities, providers should consider the benefit of improving health outcomes associated with weight loss goals of 5% to 10% of initial weight and openly

discuss options with patients (Jensen et al., 2013) in order to reduce morbidity and mortality associated with obesity.

In this study, weight management practices decreased with respondents' increasing self-reported BMI. This is similar to the findings of Petrin et al. (2016), where providers with obesity prescribed drug therapy for weight loss less frequently and were less likely to recommend bariatric surgery than their underweight, healthy, or overweight counterparts. Zhu et al. (2011) determined that providers who were overweight were less likely than normal weight providers to use preventative strategies for obesity in addition to provide general weight loss advice to patients who were overweight or obese. The provider's perception of themselves as a role model may affect their perceived professional role with patients and the promotion of healthy behaviors (Hurley, Edwards, Cupp, & Phillips, 2018).

Limitations

These findings are limited due to the correlational design of the study and low response rate. We were unable to compare responders and non-responders for analysis (Ford & Bammer, 2009). However, we did compare the sample with a known Florida NP population from the Florida Center for Nursing (FCN; 2018). Our population was slightly older; 57% were over 50 years old compared to 39% over the age of 50 in the FCN sample. The study sample's gender, race, and ethnicity profiles were similar to FCN's annual report, with the majority of NPs reported as female, white, and non-Hispanic. Surprisingly, the FCN (2018) reported that only 18% of NPs work in a 'Physician/Health Provider Office' with the large majority working in a hospital. This is in stark contrast with the AANP's (2018) sample data that showed 72.6% of all

NPs deliver primary care. Since inclusion criteria for this survey included only primary care providers, the high non-response rate may be due to a perceived lack of relevance to the topic. The Florida DOH database included all NPs licensed in Florida and did not differentiate or designate provider practice site. In the future, researchers may need to access a more specific database for primary care NPs rather than a general healthcare care provider database.

Despite the many advantages of using web-based surveys for researchers, literature has shown that the response rates can be low; approximately 10% lower than other modes of surveys (Fan & Yan, 2010; Manfreda, Berzelak, Vehovar, Bosnjak, & Haas, 2008). Vehovar and Manfreda (2017) indicated non-response rates for web-surveys could be 99%. Self-selection bias among NPs who are engaged in weight management practices may skew the results and may not be representative of the population. Additionally, self-report data on perceptions and practices may evoke a more socially desirable response despite the confidentiality of the survey results. The survey instrument did not question NPs on their pharmaceutical prescribing patterns or inquire into the volume of patients with obesity in their practice. Considering the remaining unexplained variance of weight management practices, other variables should be considered. The results from this small sample size may not be representative of NPs nationally, and therefore may not be applicable to other populations of NPs. Nonetheless, the results of this study provide insight into the weight management practice patterns of primary care NPs in Florida.

Conclusion and Recommendations

The high rate of obesity has had a significant impact on the health of the nation and revealed how unprepared primary care providers are in treating patients with obesity. The data

presented in this study broadens our understanding of how Florida NPs perceive weight management and their approach to screening and treating patients with obesity. The results suggest how high self-efficacy and perceived skills can positively impact weight management practices. Efforts by providers to increase self-efficacy for weight management should focus on training and education. NP education should specifically include curriculum changes that includes content on obesity, weight loss, and weight loss management. Additionally, referrals to specialists should be explored. The study also highlighted barriers to best practices. Health policies that incentivize providers to commit time and resources to weight management could alleviate barriers such as lack of time and lack of reimbursement. Future research should further define and address variables that influence ways NPs address obesity in their primary care practice, including the effectiveness of specific interventions in promoting weight loss in patients with obesity. The results of the survey will contribute to the development of provider resources and strategies that enhance self-efficacy and perceived skill which will ultimately lead to better health outcomes for people with obesity.

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APPENDIX A:
PRACTICE PATTERMS OF NURSE PRACTITIONERS RELATED TO WEIGHT MANAGEMENT: A DISSERTATION PROPOSAL

Abstract

Overweight and obesity rates have been steadily increasing among American adults for over four decades. This study seeks to examine primary care adult NPs' perceptions and practice patterns of weight management and explore factors that may influence the implementation of weight management practices. Guided by Pender's Health Promotion Model, this cross-sectional survey will examine the current practice patterns of NPs related to weight management in primary care and explore relationships among research variables that may influence the implementation of weight management practices. The King's Perceptions Relating to Nutrition, Exercise, and Body Weight: A Nurse's Perspective (KNEWQ) is a 61-item, self-administered questionnaire developed to measure factors underpinning weight management practices. Understanding the barriers and facilitators surrounding the clinical management of patients with obesity in primary care can help researchers and practitioners alike create a solution to appropriately addressing obesity.

Background and Significance

Overweight and obesity rates have been steadily increasing among American adults for over four decades (National Center for Health Statistics, 2017). Recent National Health and Nutrition Examination Survey (NHANES) data calculated the prevalence of obesity at almost 38% of adults over the age of 20 years old with no downturn in sight (Ogden et al., 2016). Geographically, obesity levels are highest in the southeast region of the United States, particularly amongst non-Hispanic Blacks (38.3%) and Hispanics (32.5%) (Centers for Disease Control and Prevention [CDC], 2017). The health consequences of obesity extend beyond

cardiovascular health risks, and include cancer, mental health sequelae, fertility issues, and decreased quality of life (CDC, 2018; Sundaram, Mumford, & Buck Louis, 2017).

Guidelines on weight management have been disseminated by multiple sources, including the American Heart Association/American College of Cardiology/The Obesity Society (Jensen et al., 2013), the Association of Clinical Endocrinologist/American College of Endocrinology (Garvey et al., 2016) and the Endocrine Society (Apovian et al., 2015). However, research has shown that healthcare providers may still be lacking the knowledge and skills to effectively and consistently recognize, diagnose, and treat obesity in primary care (Antognoli et al., 2014; Bleich, Pickett-Blakely, & Cooper, 2011). Lack of time, training, confidence, and reimbursement are frequently cited as barriers to weight counselling (Briscoe & Berry, 2009). One study reported only 42% of overweight and obese patients were told by their provider that they were overweight or obese (Ahn, Smith, & Ory, 2012). The literature also suggests that as little as 19% of patients with obesity reported that their healthcare provider initiated a conversation regarding their weight status (Rueda-Clausen et al., 2014). Providers need to recognize the association between excess weight and impaired health and are obligated to intervene (Ryan & Kahan, 2018).

Nurse practitioners (NPs) have an increasing presence in the primary care setting. They provide care to millions of Americans and have delivered an estimated 1.02 billion annual patient visits (American Association of Nurse Practitioners [AANP], 2018). A recent systematic review reported NPs identify and assess weight status but their general practice patterns to weight management varied greatly (Hyer, 2019). The review also highlighted the limited number

of studies that focused specifically on NPs and their approach to achieving weight loss through interventions such as a comprehensive lifestyle change program.

This data exemplifies the clinical inertia or failure of the provider to initiate or intensify therapy when indicated, surrounding the diagnoses and treatment of obesity in primary care (Phillips et al. 2001). Though past studies have examined perceptions and practices of healthcare professionals with managing obesity, they were limited. In view of the tremendous health effects obesity has on society and the positive impact NPs' make in primary care, this study seeks to examine primary care NPs' perceptions and practice patterns of weight management and explore factors that may influence the implementation of weight management practices.

Theoretical Framework

The Health Promotion Model (HPM; Pender, Murdough, & Parsons, 2002) provides a framework for the assessment of individual characteristics and the relationships among perceptions to the implementation of health promoting behaviors. The nursing model is a blend of expectancy-value theory (Feather, 1982) and social cognitive theory (Bandura, 1986, as cited in Pender et al., 2002). The HPM consists of eight core beliefs or behavior-specific cognitions: (a) perceived benefits of action; (b) perceived barriers; (c) perceived self-efficacy; (d) affect; (e) interpersonal influences; (f) situational influences; (g) commitment to a plan of action; and (h) immediate competing demands (Pender, 2011). These core beliefs can directly or indirectly affect health promoting behavior. For example, perceived self-efficacy directly influences health promoting behavior based on perceived skill; and also, indirectly by affecting perceived barriers which is further mediated by the level of commitment to an action plan (Pender et al., 2002).

In this proposal, the health promoting behavior is the NP's initiation of treatment for weight management. Accordingly, interventions aimed at motivating behavior change would examine the individual's prior behavior and personal factors (individual characteristics) and support a modification to the behavior-specific cognitions. The model provides for a wide range of behavioral-specific interventions to be targeted when the goal is to alter health behaviors that ultimately enhance the health of others (Pender et al., 2002).

The constructs of the HPM have been tested as predictors of health-promoting lifestyle or other health behavior changes, including perceived self-efficacy (Khodaveisi, Omidi, Farokhi, & Soltanian, 2017), perceived barriers (Robbins, Pender, & Kazanis, 2003), perceived benefits (Goodarzi-Khoigani, 2018) and interpersonal influences (Ronis, Hong, & Lusk, 2006). Theoretically, the HPM has been proposed to guide the NP's practice associated with weight loss maintenance (Valek, Greenwald, & Lewis, 2015). Researchers proposed that various psychological factors aid the client's motivation to maintain weight loss. The NP that incorporates the HPM to influence health promoting behavior alongside these psychological factors can increase the efficacy of their interventions with the client (Valek et al., 2015).

In comparison to these five articles where the patients' behavior was the focus, the following studies are examples where the focus was on the behavior of the nurses. Descriptive studies have utilized the theoretical underpinnings of the HPM. Lubinska and colleagues (2016) examined self-care practices of rural nurses and reported that they were more likely to engage in health promoting behaviors that were accessible at the workplace. Behavior-specific cognitions such as situational influences likely effect the health promoting behavior. Nauta et al (2009) proposed that school nurses' individual characteristics and experiences would determine their

practice patterns with childhood obesity identification and education. Following their survey of knowledge and practice patterns, utilization of BMI and reported confidence among school nurses were lower than expected. The HPM has not been extensively tested to predict the behavior change of healthcare professionals and their implementation of weight management practices. However, due to the holistic nature of the HPM constructs to explain the variance in weight management practices, it is a suitable conceptual tool to guide the current study. Additionally, use of the HPM to guide the proposed study will advance the knowledge of the model's efficacy in predicting provider behavior.

This study will draw on the constructs and definitions from the HPM including individual characteristics (prior related behavior and personal factor), behavior-specific cognitions (perceived benefit of action, perceived barriers, perceived self-efficacy, and interpersonal influences,) commitment to a plan of action, and the behavioral outcome. See Figure A.1 It is hypothesized that factors such as previous experience, education, demographic variables, perceived role identity, perceived barriers, perceived self-efficacy, and interpersonal influences such as peer behavior will predict the NP's health promoting behavior evidenced by their weight management practice patterns.

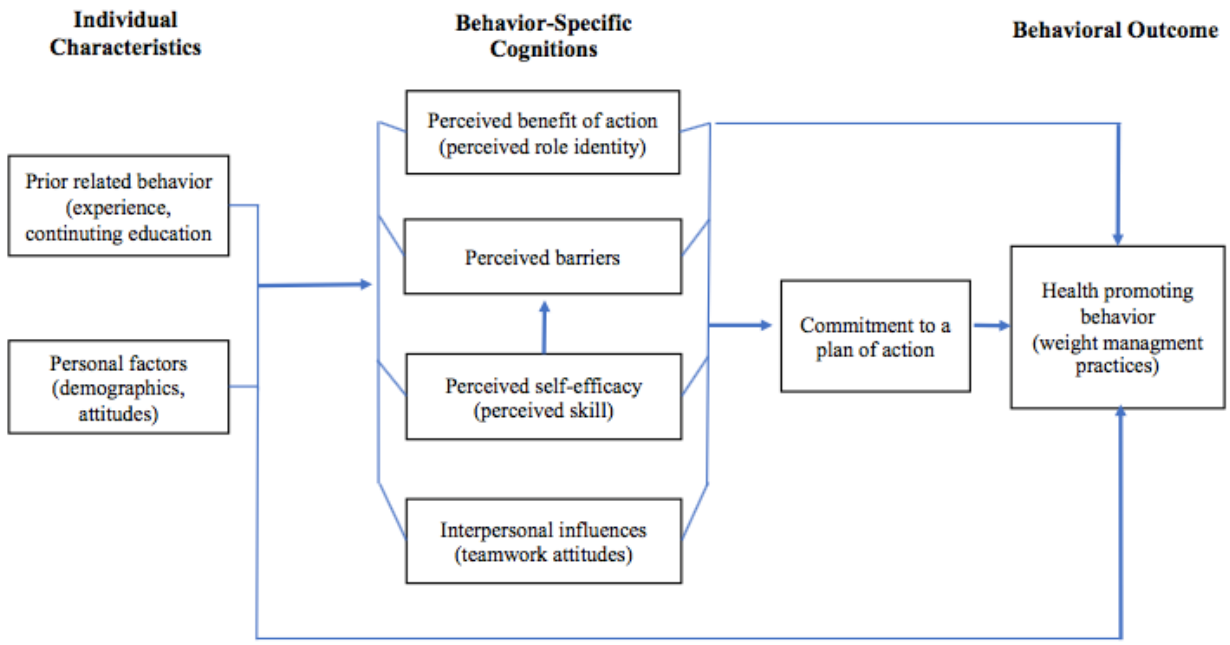

Figure A.1. Adapted health promotion model.

Conceptual and Operational Definitions

Individual Characteristics

Prior-related behavior. Conceptual definition: Actions or events are accompanied by emotion, either positive or negative. The emotion is encoded into memory and retrieved when the individual reengages in the behavior at a later time. Prior behaviors shape behavior specific cognitions (Pender et al., 2002).

Operational definition: Prior related behavior will be measured in the study participant's self-report within the demographic questionnaire in the areas of professional experience such as time in practice and educational qualifications in addition to continuing education on weight or obesity management.

Personal factors. Conceptual definition: Personal factors are categorized as biologic, psychologic, and sociocultural; they are theoretically relevant to explain or predict a targeted behavior (Pender et al., 2002).

Operational definition: The participant's self-report on the demographic questionnaire identifying biologic factors (age, ethnicity/race, gender, height, weight), psychologic factors (perceived weight status), and sociocultural factors i.e. individual scores on the Attitudes Toward Obese Persons (ATOP) scale (Zhu, Norman, & While, 2013).

Perceived benefit of action. Conceptual definition: Individuals tend to engage in behaviors or actions that will increase their experience of positive outcomes; motivating factor (Pender, 2002).

Operational definition: The perceived benefit of recognizing oneself in relation to their professional role as an NP in managing patients with obesity will be measured by the score on the Perceived Role Identity (PRI) sub-scale (Zhu et al., 2013).

Perceived barriers. Conceptual definition: Perceptions in relation to the difficulty, inconvenience, or time-consuming nature of an action (Pender et al., 2002).

Operational definition: Perceived barriers to weight management promotion will be measured by the score on the Perceived Barriers (PB) scale (Zhu et al., 2013).

Perceived self-efficacy. The central role of self-efficacy in the HPM is based on the definition and concepts proposed by Bandura (1997, as cited in Pender et al., 2002) and social cognitive theory (Bandura, 1989), that is simply stated as a judgement of one's ability to execute a task. Pender and colleagues (2002) theoretically link perceived self-efficacy to the likelihood of

committing to an action plan and performance of the behavior thus proposing that a greater perceived self-efficacy yields fewer perceived barriers.

Operational definition: Self-efficacy will be measured by the score on the Perceived Skills (PS) scale and the Self-efficacy (SE) sub-scale (Zhu et al., 2013).

Interpersonal influences. Conceptual definition: Views regarding the behaviors, beliefs, and attitudes of peers and other health care providers (Pender et al., 2002). Influences include the expectations of others, encouragement, and modeling or learning through the behavior of others.

Operational definition: Interpersonal influences will be measured by the score on the Teamwork Beliefs (TWB) subscale (Zhu et al., 2013).

Commitment to an action plan. The behavioral event is initiated by the individual's commitment to a plan of action (Pender et al., 2002). Within the HPM, the individual will (a) engage in a specific behavior at a given place and time with particular persons regardless of competing demands and (b) identify guidelines to support the behavior (Pender et al., 2002). This is operationally defined by the individual's self-report of current nursing practice questionnaire (Zhu et al., 2013).

Behavioral outcome. The end-point in the HPM, the behavioral outcome variable is aimed at "attaining positive health outcomes" (Pender et al., 2002, p. 74). Operationally defined, the behavioral outcome will be measured by the Weight Management Practices (WMP) scale (Zhu et al., 2013).

Specific Aims

Obesity is a multidimensional, chronic disease. Due to the high rate of comorbidities associated with obesity, patient outcomes may suffer due to the clinical inertia of diagnosing and managing obesity. However, there is a scant amount of literature on the perceptions of managing obesity among primary care NPs within the U.S. The problem to be addressed in this study is the knowledge gap within the scientific literature of the perceptions, barriers, and weight management practice patterns among NPs. Courtney et al. (2010) reported that a majority of NPs assess and discuss weight loss goals with patients but rarely prescribe weight loss pharmaceuticals or make referrals for bariatric surgery. These pharmaceutical prescribing patterns were consistent with more recent self-report survey data of NPs (Granara & Laurent, 2017; Petrin, Kahan, Turner, Gallagher, & Dietz, 2016). In a retrospective chart review, NPs were initiating weight loss interventions 61% of the time versus physicians' rate of 7.8% (Magee, Everts, & Jamison, 2012). Previous studies, while informative, lack the depth of more comprehensive data that measures NPs' perceptions, barriers, and practices with a valid and reliable instrument. Addressing these gaps to understand the barriers and facilitators surrounding the clinical management of patients with obesity in primary care, researchers and practitioners alike can create a solution to appropriately addressing obesity. The purpose of this study is to examine NPs' perceptions and practice patterns of weight management and explore factors that may influence the implementation of weight management practices in primary care in order to identify best practices and areas for further development.

Research questions include:

- RQ1: What are current weight management practices among NPs in primary care settings?

- RQ2: To what extent do attitudes toward patients with obesity, self-efficacy, and perceived barriers influence weight management practices among NPs?
- RQ3: What is the relationship between the NP's weight management practices and their age, ethnicity/race, personal BMI, perceived weight status, education, time in practice, and continuing education on obesity?

The relevance and importance of this research is significant as the study seeks to quantify measurable variables on the practice patterns of NPs related to weight management in primary care. This data will contribute to nursing science in several areas. First, understanding relationships between NPs and weight management practices will elucidate the profession's activities and aid researchers, practitioners, educators, and policymakers to evaluate modifications to curricula or continuing education objectives. Second, quantifying these variables would lay the foundation for future initiatives that will study quality or economic impacts of NP driven care. For example, if programs aimed at addressing the clinical inertia of obesity are effective in lowering obesity rates in the community, then investigating patient quality of life or healthcare utilization data would be prudent. Third, overcoming negative perceptions and barriers to managing patients with obesity would advance the NP's approach to weight management by improving patient-provider communication that will benefit the patient. Lastly, researchers often study NPs alongside other healthcare professionals and disciplines. The findings from those studies are an aggregated reflection of the data. This proposed study aims to avoid this over generalization of providers and focus specifically on the practice patterns of NPs.

Research Design and Methods

Design

This cross-sectional survey design will examine the current practice patterns of NPs related to weight management in primary care and explore relationships among specific variables that may influence the implementation of weight management practices.

Sample

The study population will be NPs in the state of Florida. According to a Florida Department of Health (DOH; 2016) report, there are 22,595 licensed, active, in-state NPs in Florida. Additionally, the state of Florida has an adult obesity rate of 25-29% (CDC, 2017). A power analysis was completed through SAS (version 9.4). The program calculated a total sample size of 199 participants for a multiple linear regression model based on 0.05 significance level, moderate effect size (0.5) and a power of .80. The regression model for RQ2 has four predictor variables and the model for RQ3 has seven predictor variables.

Response rates of nurses for electronic surveys average around 20% (Hart, Brennan, Sym, & Larson, 2009). In order to overcome problems due to low response rates or incomplete questionnaires, a larger sample of 10,000 NPs will be planned based on the projected response rate and the minimum sample size from the power analysis. If the response rate is low after this first stage of sampling, the investigator will select a second group of randomized participants from the same database to recruit.

Inclusion criteria includes NPs whose clinical practice involves adult patients with obesity in primary care settings. Exclusion criteria includes non-NP registered nurses, inactive NPs, or NPs not currently practicing in a primary care setting that serves an adult patient population.

Instruments

The King's Perceptions Relating to Nutrition, Exercise, and Body Weight: A Nurse's Perspective (KNEWQ)

The KNEWQ (Zhu et al., 2013) is a self-administered questionnaire developed to measure factors underpinning weight management practices (see Appendix B). The 61-item instrument is comprised of five scales: attitudes toward obese persons, attitudes toward weight management (comprised of three subscales: professional role identity, teamwork beliefs, and self-efficacy), perceived barriers, perceived skills, and weight management practices. Zhu and colleagues (2013) established the psychometric properties of the KNEWQ. Content validity was performed with 14 registered nurses (RNs) with expertise in obesity management. Overall reliability has not been reported in the literature, however Cronbach's alphas for the individual scales range from 0.73 to 0.86 (Zhu et al., 2013). Test-retest reliability was conducted over a two-week period with 34 participants. Each Likert scale's intra-class correlation coefficient was then calculated; the ICC range from 0.60 to 0.87 (Zhu et al., 2013). Item analysis was used to assess the validity of each item and exploratory factor analysis was conducted to assess the underlying constructs of each scale. Selected factors were based on the screen test and a minimum eigenvalue of 1.00 (Zhu et al., 2013).

KNEWQ Scales

Attitudes toward obese persons (ATOP). The ATOP is a 20-item scale that measures attitudes toward people with obesity. It is formatted with a 6-point Likert scale (-3 = strongly disagree, 3= agree). A total score could range from 0 – 120, with higher scores indicating more positive attitudes. The Cronbach's alpha was 0.81 (Zhu et al., 2013).

Attitudes toward weight management (ATWM). The ATWM is a 17-item scale, comprised of three subscales which measure: self-efficacy (SE, 8 items); professional role identity (PRI, 4 items); and teamwork beliefs (TWB, 5 items). It is formatted with a 6-point Likert scale (1=strongly disagree, 6 =strongly agree). The Cronbach's alpha for the whole scale was 0.85 and for the SE, PRI, and TWB subscales 0.82, 0.80, and 0.73, respectively (Zhu et al., 2013).

Perceived barriers (PB). The PB is a nine-item scale that measures commonly reported barriers to weight management. It is formatted with a 6-point Likert scale (1=strongly disagree, 6 =strongly agree). A total score could range from 9-54. The Cronbach's alpha was 0.81 (Zhu et al., 2013).

Perceived skills (PS). The PS is a seven-item scale that measures the reported skills for the prevention and treatment of overweight and obesity. The item responses include 1= low level, 2= moderate level and 3= high level. A total score could range from 7-21. The Cronbach's alpha was 0.83 (Zhu et al., 2013).

Weight management practices (WMP). WMP is an eight-item scale that measures the percentage of patients who receive the clinical service such as assessing BMI, waist circumference, counseling services, or referrals. The Likert scale uses a 5-point scale, 1=0%,

2=0-25%, 3=26-50%, 4=51-75%, and 5=>75%. The Cronbach's alpha was 0.86 (Zhu et al., 2013).

Demographics. The demographic section of the KNEWQ will be adapted to language that is more appropriate to NPs working within the U.S. Items will query age, gender, ethnicity/race, height and weight to calculate BMI (weight (kg) / [height (m)]^2, and education. The survey will also inquire about continuing education related to obesity, time in practice, and practice location (rural/urban). Additionally, there is an item assessing perceived weight status ('How would you describe yourself?'). Responses include underweight, normal, overweight, or obese. Factors associated with perceived weight status were discussed in a separate study (Zhu, Norman, & While, 2014), outside of the psychometric analysis of the KNEWQ.

Data Collection Procedures

The paper-based KNEWQ questionnaire will be uploaded to Qualtrics® by the investigator and delivered as an online survey. The questionnaire will be distributed electronically to 10,000 NPs within the state of Florida to ensure an adequate sample size. Systematic sampling will be used to randomly select participants from the Florida DOH public data portal of practitioners (n.d.) who have an email address. A pre-notification email will precede the email invitation to the online survey (see Appendix B). Pre-notification letters were found to be an important factor in high response rates (Saleh & Bista, 2017). The invitation email will be comprised of a cover letter describing the study, assuring confidentiality, along with a link to connect participants to the survey powered by Qualtrics® (see Appendix C). Completion of the survey will be considered consent to participate. A reminder email will be sent one week

after the initial survey invitation. The survey will remain open for a period of up to 3 months. If an inadequate amount of surveys are returned after this first stage of sampling, the investigator will select a second group of randomized participants from the same database to recruit with a matching timeline as the initial group of participants.

Data Analysis Procedures

Data from Qualtrics® will initially be exported to an Excel spreadsheet to ensure a secured, backup file. Thereafter, data will be imported into SPSS Statistics, version 24 (IBM Corp., Armonk, N.Y., USA) for statistical analysis. Data will be coded and assessed for irregularities and missing data. Predetermined codes will be entered for missing values (Polit, 2010). Submitted surveys with greater than 10% missing data will be excluded from analysis. Imputation strategies such as case-mean substitution will be considered to estimate missing values (Polit, 2010). Demographic content will be summarized and reported via frequency counts and percentages for categorical variables and averages with standard deviation for continuous variables. Data analysis will be based on the following research questions.

- RQ1: What are current weight management practices among NPs? Descriptive statistics for WMP scores will be evaluated for skewness and summarized with mean, standard deviation, median, mode, and range.
- RQ2: To what extent do attitudes toward patients with obesity, self-efficacy, and perceived barriers influence weight management practices among NPs? A stepwise multiple linear regression model will be assessed to establish a prediction relationship

of ATOP, SE, PS, and PB scores (predictor variables) and WMP scores (dependent variable).

- RQ3: What is the relationship between the NP's weight management practices and their age, personal BMI, perceived weight status, education, time in practice, continuing education on obesity, and ethnicity/race? A stepwise multiple linear regression model will be assessed to establish a prediction relationship of age, personal BMI, perceived weight status, education, time in practice, continuing education on obesity, and ethnicity/race and WMP scores.

Limitations

There are a number of potential threats against external validity that need to be identified during the planning phase of the study. A sound sampling plan is an important step in this process. The risk of sampling bias must be considered with the use of an electronic survey to ensure a representative sample is achieved (Polit & Beck, 2017). A nonresponse bias or self-selection bias among respondents may disrupt the representativeness of the sample (Polit & Beck, 2017). Also, discussions regarding obesity and healthcare practices for patients with obesity have the potential to elicit a social desirability response bias from participants. Clear instructions that ensure confidentiality on the self-report questionnaire could however minimize this bias (Polit & Beck, 2017). Additionally, missing data due to respondent fatigue or boredom are potential negative effects of a lengthy test (Waltz, Strickland, & Lenz, 2017). Lastly, a cross-sectional, correlational design generally precludes generalizability; nonetheless this study will contribute valuable data in documenting the phenomenon (Polit & Beck, 2017).

Timetable

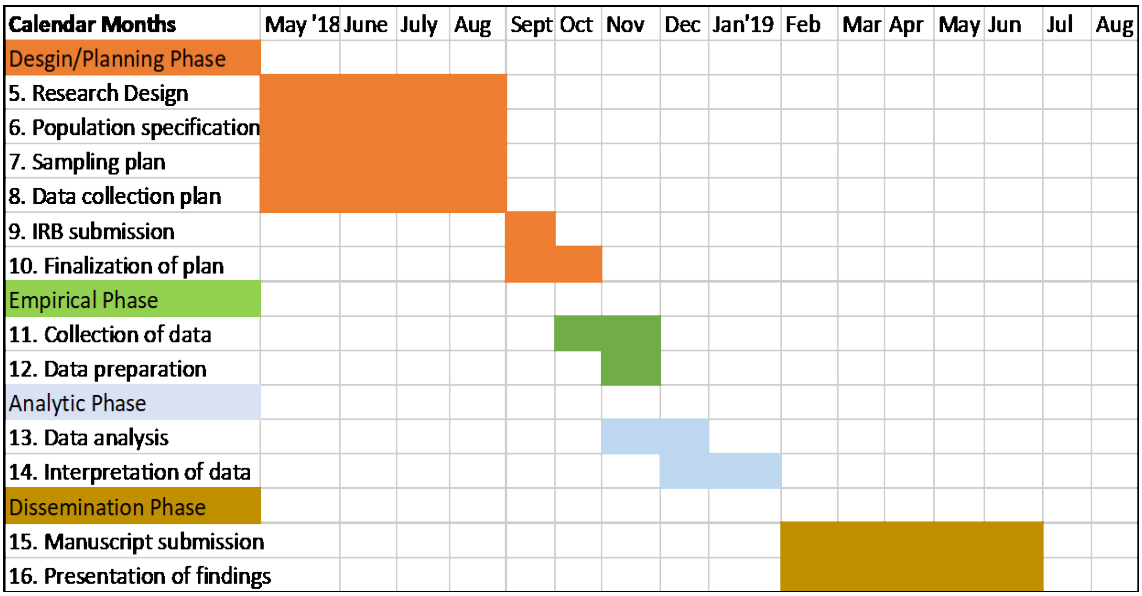

Figure A.2. Proposed timetable for research activities. Adapted from *Nursing research: Generating and assessing evidence for nursing practice* (10th ed), by D. Polit and C. Beck. (2017). Philadelphia, PA: Lippincott, Williams, and Wilkins. Copyright 2017 by Lippencott, Williams, and Wilkings.,

Protection of Human Participants

An application to University of Central Florida's Institutional Review Board (IRB) will be submitted and approved for compliance with regulatory and ethical requirements. No personally identifiable information will be collected. A statement of confidentiality will be presented to participants. Survey data will be stored in a portable storage device which will be password protected and locked in the investigator's office.

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APPENDIX B:
STUDY INSTRUMENT

King's Perceptions Relating to Nutrition, Exercise, and Body Weight

Section A: Views about Obese People

The following questions are about the extent to which you agree or disagree with a series of statements. Please indicate which best describes your view on each statement.

To what extent do you agree with the following statement?

	Strongly Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Strongly Disagree
Obese people are as happy as non-obese people						
Most obese people feel that they are not as good as other people						
Most obese people are more self-conscious that other people						
Obese workers cannot be as successful as other workers						
Most non-obese people would not want to marry anyone who is obese						
Severely obese people are usually untidy						
Obese people are usually sociable						
Most obese people are satisfied with themselves						
Obese people are just as self-confident as other people						
Most people feel uncomfortable when they associate with obese people						
Obese people are often less aggressive than non-obese people						
Most obese people have different personalities than non-obese people						
Very few obese people are ashamed of their weight						
Most obese people resent normal weight people						
Obese people are more emotional than non-obese people						
Obese people should not expect to lead normal lives						

	Strongly Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Strongly Disagree
Obese people are just as healthy as non-obese people						
Obese people are just as sexually attractive as non-obese people						
Obese people tend to have family problems						
One of the worst things that could happen to a person would be for him or her to become obese						

Section B: Views on Involvement in Patient Care

The following questions are about the extent to which you agree or disagree with a series of statements. Please indicate which best describes your view on each statement.

To what extent do you agree with the following statement?

	Strongly Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Strongly Disagree
If a patient is in need of healthy eating advice, I can offer this						
Patients are generally willing to make dietary changes that I recommend						
If I think that a presenting patient should lose weight, I will advise, even if they are not actively seeking help						
If an overweight person is seeking help, I always discuss the probable causes of their excess weight						
I can determine a patient's body mass index (BMI) and assess whether they are overweight or obese						
I have been successful in treating overweight patients						
If a patient is in need of weight loss, I can readily advise on the best method						
If I had more time in consultations, I would actively promote weight management to patients						
General practitioners should offer advice to all their patients who are overweight						

	Strongly Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Strongly Disagree
There should be specialist positions for dieticians in weight management						
Specially trained nurses are valuable in providing weight reduction diets for patients						
An overweight patient needs supportive family and friends involved in his/her treatment						
The media could successfully work in partnership with health professionals to provide clear consistent messages						
Nurses should be health advocates, insisting that preventive health is put on the political agenda						
Nurses should take more responsibility for health promotion						
Nurses should set a good example by practicing a healthy lifestyle						
Nurses are the most appropriate health personnel to get involved in health promotion						

In what *percentage of your patients with weight problems* do you typically do the following?

Please indicate which best describes your practice as it relates to each activity.

	0%	1-25%	26-50%	51-75	75%
Complete a BMI assessment					
Measure waist circumference					
Give **general lifestyle** advice about weight management					
Give detailed/tailored advice about **diets** (i.e. restricted calorie diets)					
Give detailed/tailored advice about **physical activity** (i.e. frequency, duration, and intensity of exercise)					
Provide informational resources					
Provide emotional support					

Complete a BMI assessment					
Refer to another health provider (i.e. exercise specialist, nutritionist, dietician or psychiatrist) if available					
Others…….					

To what extend do you agree or disagree that the following are *barriers to prevent weight management promotion*? Please indicate which best describes your views on each statement.

	Strongly Agree	Moderately Agree	Slightly Agree	Slightly Disagree	Moderately Disagree	Strongly Disagree
Lack of time						
Lack of patient interest and readiness for change						
Inadequate training in effective weight management						
Intrusion into patient's privacy						
Absence of clear practice guidelines, educational tools and materials						
Unsure of knowledge						
Complex patients (i.e. more serious comorbid conditions, older patients with functional limitations)						
Insufficient compensation						
Language barrier						
Others……..						

Please rate your *skill level in weight management* by choosing which best represents your perceived skill.

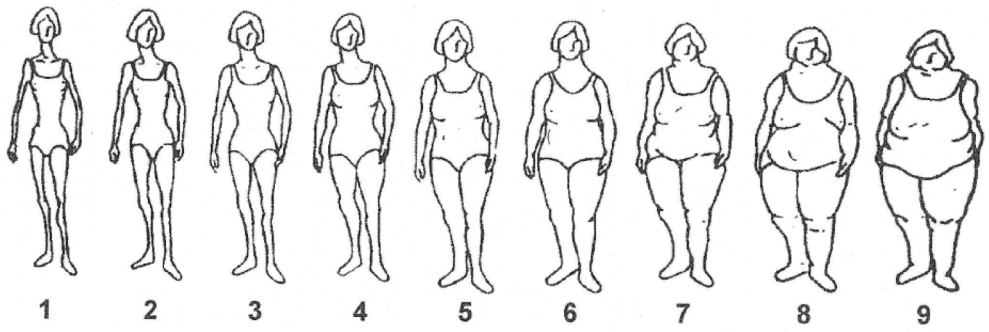
	high	moderate	low
Use of behavioral management strategies			
Modification of eating practices			
Modification of physical activity			
Modification of sedentary behavior			
Assessment of the degree of overweight			
Counseling skills			
Referral to other specialist (i.e. physicians, dieticians, psychotherapists, a support group)			
Others……			

Which of the following best describes your own *current nursing practice* regarding promotion of weight management? Please mark ONE box only.

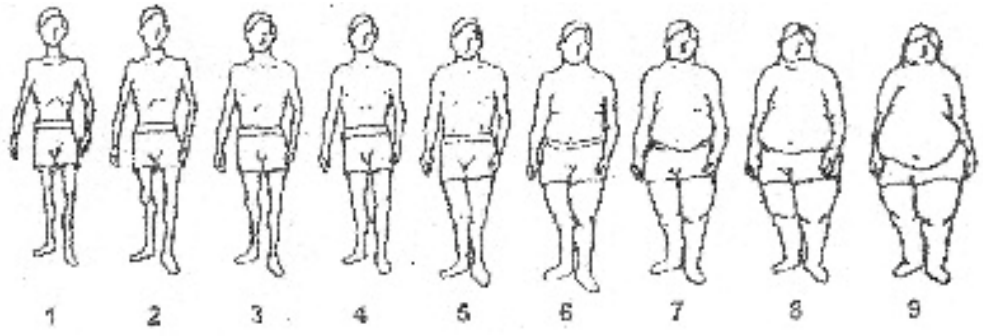
I never promote weight management and I don't intend to start.	
I do not promote weight management at the moment but I am thinking about starting.	
I promote weight management occasionally but not regularly.	
I promote weight management regularly but have just started doing this recently.	
I promote weight management regularly and have done so for at least six months.	
I have promoted weight management in the past but am not doing it now.	

Section C: Rating of Normal Weight

Using the figures below, please *choose the number of the figure* that best represents your idea of the female body shape you associate with 'normal weight'.



Using the figures below, please *choose the number of the figure* that best represents your idea of the male body shape you associate with 'normal weight'.



Section D: Demographics

1. Age (years):

2. Gender: M/F/Prefer not to answer

3. Are you of Hispanic, Latino, or of Spanish origin? Yes/No

4. How would you describe yourself?

- American Indian or Alaska Native
- Asian
- Black or African American
- Native Hawaiian or other Pacific Islander
- White

5. Height:

6. Weight:

7. Highest educational qualification: Master's DNP PhD EdD other

8. Have you received any training or participated in continuing education for weight management (i.e. nutrition, exercise, weight loss)? Yes/No
If yes, did you receive between 0-2 hours, 3-8 hours, or >8 hours?

9. How long have you been practicing as a nurse practitioner?

10. Practice location: Urban Area (50,000 or more people)
Urban Clusters (at least 2,500 and less than 50,000 people)
Rural (encompasses areas not included within an urban area)

11. How would you describe yourself? Choose one: Underweight/ Normal/ Overweight/ Obese

APPENDIX C:
PRE-NOTIFICATION LETTER

Dear Colleague,

You will be receiving an invitation for an upcoming research study for nurse practitioners who manage patients with obesity in primary care settings. You have been randomly selected from the Florida Department of Health's Health Care Practitioner Data Portal.

The purpose of this research is to determine nurse practitioner's practice patterns and perceptions related to weight management. Your participation in the online questionnaire will help researchers better understand how nurse practitioners manage patients with obesity in primary care. You will be asked questions about yourself as a primary care nurse practitioner and your clinical practice patterns. The study is voluntary.

The survey will take between 10-15 minutes of your time to complete. No personally identifiable information will be collected and all survey responses will be kept confidential.

When you receive the study invitation via email, please follow the instructions to connect to the online survey link within the email.

Thank you for your time and contribution to nursing science and patient care.

Sincerely,

Suzanne Hyer, MSN RN
PhD Student, University of Central Florida
Jonas Nurse Leader Scholar
shyer@knights.ucf.edu

APPENDIX D:
COVER LETTER

EXPLANATION OF RESEARCH

Title of Project: Practice Patterns of Nurse Practitioners related to Weight Management

Principal Investigator: Suzanne Hyer, MSN RN

Faculty Supervisor: Joellen Edwards, PhD RN

You are invited to take part in a research study. Whether you take part is up to you.

- The purpose of this research is to determine nurse practitioner's practice patterns and perceptions related to weight management.

- Your participation in the online questionnaire will help researchers better understand how nurse practitioners manage patients with obesity in primary care. You will be asked questions about yourself as a primary care nurse practitioner and your clinical practice patterns.

- The online survey, generated through Qualtrics®, will take between 10-15 minutes of your time to complete. No personally identifiable information will be collected and all survey responses will be kept confidential.

You must be 18 years of age or older and be an actively licensed NP whose clinical practice involves adult patients with obesity in primary care to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints: Suzanne Hyer, Graduate Student, PhD, College of Nursing, (407) 823-2744 or Dr. Joellen Edwards, Faculty Supervisor, Department of Nursing Systems at (407) 823-5440 or by email at shyer@knights.ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been determined to be exempted from IRB review unless changes are made. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901.

APPENDIX E:
KNEWQ INSTRUMENT AGREEMENT

Application Agreement for the King's Perceptions Relating to Nutrition, Exercise and Body Weight: A Nurse's Perspective (KNEWQ)

Party A (copyright owner): Da Qiao Zhu, Alison E While, and Ian J Norman

Alison E While signs application agreement on behalf of the research group.

Affiliation: King's College London

Party B (questionnaire user): [signature]

Affiliation: University of Central Florida

Please fill in the following information of the supervisor if the questionnaire user is a student.

Party C (the supervisor): Joellen B Edwards, PhD, RN, FAAN

Affiliation: University of Central Florida

Party A, B (and C) sign this agreement for application of the King's Perceptions Relating to Nutrition, Exercise and Body Weight: A Nurse's Perspective (KNEWQ) The Parties agree, acknowledge and undertake on the terms set out below.

Term 1 Party A is willing to provide the KNEWQ to Party B for free use in order to promote the academic communication.

Term 2 Party B should inform Party A if any content in the KNEWQ is changed in the usage.

Term 3 Party A agrees that party B includes the KNEWQ in the dissertation of the appendixes. However, the full text of the KNEWQ should not be published in any publications without written permission from Party A.

Term 4 Party B should cite the KNEWQ correctly and acknowledge the work of Party A in the dissertation and publications.

Party A (signature) Party B (signature) Party C (signature)

Date:

Application Agreement for the King's Perceptions Relating to Nutrition, Exercise and Body Weight: A Nurse's Perspective (KNEWQ)

Party A (copyright owner): Da Qiao Zhu, Alison E While, and Ian J Norman

Alison E While signs application agreement on behalf of the research group.

Affiliation: King's College London

Party B (questionnaire user): [signature]

Affiliation: University of Central Florida

Please fill in the following information of the supervisor if the questionnaire user is a student.

Party C (the supervisor): Joella B Edwards, PhD, RN, FAAN

Affiliation: University of Central Florida

Party A, B (and C) sign this agreement for application of the King's Perceptions Relating to Nutrition, Exercise and Body Weight: A Nurse's Perspective (KNEWQ) The Parties agree, acknowledge and undertake on the terms set out below.

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Term 4 Party B should cite the KNEWQ correctly and acknowledge the work of Party A in the dissertation and publications.

Party A (signature) Party B (signature) Party C (signature)

Date:

APPENDIX F:
CITI CERTIFICATION PROGRAM

CITI PROGRAM

Completion Date 23-Apr-2018
Expiration Date 22-Apr-2021
Record ID 25862650

This is to certify that:

Suzanne Hyer

Has completed the following CITI Program course:

Social and Behavioral Responsible Conduct of Research (Curriculum Group)
Social and Behavioral Responsible Conduct of Research (Course Learner Group)
1 - RCR (Stage)

Under requirements set by:

University of Central Florida

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w328c2d6a-ca35-47b5-96c8-23186a14064d-25862650

APPENDIX G:
INSTITUTIONAL REVIEW BOARD OUTCOME LETTER

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Suzanne Hyer**

Date: **October 15, 2018**

Dear Researcher:

On 10/15/2018, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review:	Exempt Determination
Project Title:	Practice Patterns of Nurse Practitioners Related to Weight Management
Investigator:	Suzanne Hyer
IRB Number:	SBE-18-14446
Funding Agency:	
Grant Title:	
Research ID:	n/a

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

This letter is signed by:

Signature applied by Gillian Morien on 10/15/2018 11:50:10 AM EDT

Designated Reviewer

APPENDIX H:
PUBLISHER PERMISSION: WOLTERS KLUWER

RE: permission request JAANP-18-0134

Health Permissions <healthpermissions@wolterskluwer.com>
Mon 3/11/2019 2:07 PM
To: Suzanne Hyer <suzannehyer@hotmail.com>

Hi Suzanne,

Thank you for getting back to me. Yes, the preprint version can be used in your thesis. Our Article Sharing Guidelines outline the following:

"Preprints of articles can be posted anytime and anywhere, including on SCNs. If the article is accepted, to ensure that readers can find and cite the final published version, Wolters Kluwer encourages researchers to add the Digital Object Identifier (DOI) to the posted preprint version."

You can certainly include the preprint version in your thesis, and then update the content to your final peer-reviewed manuscript 12 months from your article's publication date.

Our Article Sharing Guidelines are posted here for reference:
https://shop.lww.com/journal-permission

Thank you.
Jenna

Wolters Kluwer Permissions Team
Health Learning, Research & Practice
Wolters Kluwer
healthpermissions@wolterskluwer.com

APPENDIX I:
CURRICULUM VITAE

Suzanne Hyer MSN, RN

shyer@knight.ucf.edu

EDUCATION

Year	Degree	Institution	Clinical Major	Role Preparation
In progress	PhD	University of Central Florida	Nursing	Research
2015	MSN	Loyola University, New Orleans, LA	Health Care Systems Management	Administration
2007	BSN	Regis University, Denver, CO	Nursing	
1999	ASN	Broward College, Ft. Lauderdale, FL	Nursing	

LICENSURE/CERTIFICATION

RN	Florida, RN9365593

EMPLOYMENT

CLINICAL APPOINTMENTS:

01/11-01/12	**Clinical Application Specialist**, Sonosite, Inc. Washington, DC
01/10-09/10	**Nurse Consultant**, Food & Drug Administration, Silver Spring, MD
03/09-01/10	**Clinical Trial Educator,** Quintiles, Washington, DC
08/04-06/08	**Clinical Consultant,** Kinetic Concepts, Tucson, AZ
10/01-08/04	**Staff Nurse,** Critical Care/Cardiac Cath Lab/PACU, University Medical Center, Tucson, AZ
06/00-03/02	**Staff Nurse,** Telemetry, Sierra Vista Community Hospital, Sierra Vista, AZ
01/00-11/00	**Staff Nurse,** Medical Surgical, Tucson Medical Center, Tucson, AZ

PUBLICATIONS

LaManna J, Litchman ML, Dickinson JK, Todd A, Julius MM, Whitehouse CR, **Hyer** S, Kavookjian J. (2019). Diabetes education impact on hypoglycemia outcomes: A systematic review of evidence and gaps in the literature. Manuscript submitted for publication.

Hyer, S. (2019). Practice patterns of nurse practitioners related to weight management in primary care: A systematic review. *Journal of the American Association of Nurse Practitioners 31*(4) 236-244. doi: 10.1097/JXX.0000000000000122

RESEARCH and GRANTS

OTHER FUNDING

Date	Role	Title	Agency	Type	Amount
2019	PhD Student	PhD Dissertation Research Award	University of Central Florida	Intramural	$1,000
2016	PhD Student	Jonas Scholar	University of Central Florida	Intramural	$20,000
2016	PhD Student	Professional Development Fellowship	U.S. Department of State	Extramural	$2,500
2014	Student	Professional Development Fellowship	U.S. Department of State	Extramural	$2,500

PRESENTATIONS—NATIONAL/INTERNATIONAL
NA

PRESENTATIONS—LOCAL/REGIONAL/STATE
NA

HONORS/AWARDS
NA

PROFESSIONAL ACTIVITIES & COMMUNITY SERVICE

PROFESSIONAL ORGANIZATIONS:

Date	Organization	Role
2019 - Present	Southern Nursing Research Society	Member
2015	Florida Nurses Association	Awards Committee
2015 - Present	Xi Psi Chapter, Sigma Theta Tau	Member
2015 - Present	American Nurses Association	Member
2015 - Present	Florida Nurses Association	Member

PUBLICATION EDITORIAL BOARDS AND REVIEW:
NA

MEDIA INTERVIEWS:
NA

COMMUNITY SERVICE:

CONSULTATION:
NA

<u>UNIVERSITY ACTIVITIES</u>

UNIVERSITY SERVICE: (Cumulative)
NA

DISSERTATION / THESIS / RESEARCH PROJECT ADVISING:
NA

COURSES TAUGHT:
NA