Increasing Knowledge in Obesity Management Using an Educational Activity

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Introduction

Obesity today is a challenge for people across the globe. Recent statistics show that nearly one-third of the United States (US) adults and 17% of US children are obese (Ogden, Carroll, Fryar, & Flegal, 2014). The Center for Disease Control and Prevention (CDC), (2015) reports that obesity is closely associated with chronic illnesses such as coronary artery disease, type 2 diabetes mellitus, hypertension, hypercholesterolemia, cancers, and other disease processes that affect 34.9% or 78.6 million of the US adult population. Estimated medical costs for obesity-related diseases in the US range as high as $209.7 billion, that accounts for 20% of all US healthcare costs per year (Spieker & Pyzocha, 2016). Recent evidence indicates 43% of adults are trying to lose weight and 23% are struggling to maintain their weight (Pasarica & Topping, 2017), yet there is limited provider-directed obesity treatment (Stanford, Johnson, Claridy, Earle, & Kaplan, 2015). Studies in obesity treatment demonstrate providers' lack of knowledge, skills, and confidence in treating obesity (Pasarica & Topping, 2017; Stanford et al., 2015). These gaps in education can leave providers ineffective when treating obesity and its associated illnesses (Glauser, Roepke, Stevenin, Dubois, & Ahn, 2015). The need for education in evidence-based obesity management and current guidelines and recommendations has encouraged the development of this project.

Dietz et al. (2015) in their study, claim that the current clinical care delivery systems work for acute health conditions but fail to address the prevention and control of chronic diseases. In their efforts to improve obesity management, the U.S. Preventative Task Force, the American College of Cardiology, the American Heart Association, and The Obesity Society have announced evidence-based guidelines and recommendations which the providers fail to use because of lack of knowledge, skills and confidence (Garvey et al., 2016; Jensen et al., 2014;

Pasarica & Topping, 2017). Studies demonstrate provider education in addressing these gaps in knowledge, skills, and confidence may lead to improved management of obesity and prevention of chronic illness (Blackburn, Stathi, Keogh, & Eccleston, 2015; Jannah, Hild, Gallagher, & Dietz, 2018; Pasarica & Topping, 2017; Stanford et al., 2015). In view of this gap, this project ventured to increase provider confidence through education using learning modules and weekly discussions of evidence-based weight management interventions.

Background and Significance

Globally, obesity has tripled since 1975, affecting 1.9 billion adults, 18 years of age and older, and approximately 340 million adolescents and children (World Health Organization [WHO], 2018). The National Academy reports obesity as a major contributor to the increasing rates of chronic diseases in the US (Dietz et al., 2015). Seven out of ten deaths in the US are due to chronic diseases, and 85% of US health costs are attributed to the treatment of these diseases (CDC, 2015; Dietz et al., 2015). The complex mechanisms of obesity are multifactorial with genetic, behavioral, socioeconomic and environmental effects, increasing the risk of morbidity and mortality (Hurby & Hu, 2015). The ubiquity of these risk factors currently surpasses the ability of the medical system, emphasizing the need for a multifaced health approach to reduce chronic diseases associated with obesity (Dietz et al., 2015).

With the vast number of world citizens affected by this disease, policymakers have created initiatives to address obesity and its management. The American Diabetes Association (ADA), (2019), has announced guidelines for the first time that includes intensive interventions and counseling for prediabetics. Organizations such as the CDC have announced strategies to make healthy eating and active living affordable and accessible to all, and have distributed consistent evidence-based practices and recommendations for state, local, public health

organizations, grantees and practitioners (CDC, 2015). The Campaign to End Obesity Action Fund has introduced legislation to confront this crisis. The Treat and Reduce Obesity Act of 2017, introduced in both the Senate and the House, has given seniors access to obesity counseling to help them manage their weight. Along with diet, exercise, and surgery, seniors can receive counseling from trained health care professionals and FDA-approved pharmaceutical therapy. The Centers for Medicare and Medicaid Services (CMS), have announced coverage for preventive services. Effective Nov 29, 2011, CMS began to cover fifteen minutes of intensive behavioral therapy for obesity which can be reported as HCPCS code G0447 defined as "face-to-face" behavioral counseling for obesity. Additionally, as of January 1, 2015, providers are able to use the same code, for each beneficiary participating in a group setting of two to ten participants. Counseling services provided in a primary care setting for Medicare beneficiaries with BMI ≥30 kg/m2 are eligible for weekly visits for the first month followed by biweekly visits for month two through six. If the beneficiary meets the 3kg (6.6 lbs.) weight loss requirement during the first 6 months, counseling is further covered for one visit every month for months seven through twelve. For beneficiaries who do not achieve this requirement during the first six months, a reassessment is appropriate after an additional 6-month period (CMS, 2015). Jannah et al. (2018), in their review of Medicaid and health insurance program of state employees of all fifty states and the District of Columbia, from the year 2009 to 2017, found increased coverage in treatment modalities that included nutritional counseling, pharmacotherapy, and bariatric surgery. Jannah et al. (2018) concluded that in areas of increased coverage, educating providers may improve health disparities.

Despite recognizing the debilitating impact of obesity on health and the economy, obesity management remains inconsistent among providers (Blackburn et al., 2015). Today, 30% of the

world's adult citizens are overweight or obese (Kelly, Yang, Chen, Reynolds, & He, 2008). If the growth rate of obesity continues at this current pace, by 2030 nearly half the world's population will be either overweight or obese with the global economic cost reaching 2 trillion (Kelly et al., 2008). Obesity has debilitating effects on almost every aspect of physical and mental health, and if left untreated, it increases morbidity risk, mortality, and life expectancy (Abdelaal, Roux & Docherty, 2017). Rising challenges of chronic diseases and multi-morbidities have left providers with feelings of powerlessness, which education can remedy (Braillard, Slama-Chaudhry, Jolly, Perone, & Beran, 2018). Improved guidance on the available guidelines will empower providers to make an informed decision when treating obesity (Jannah et al., 2018; Dietz et al., 2015).

This DNP project evaluated the effectiveness of education using learning modules and group discussions in a practice in South Jersey. The modules included the different modalities of treatment with resources, current guidelines and recommendations, and resources for reimbursement.

Needs Assessment

The United States Preventative Services Task Force (USPSTF) reports 70% of an estimated 86 million prediabetics will develop type 2 diabetes and the current primary care recommendation is to screen for prediabetes and diabetes followed by intensive lifestyle modifications that promote healthy eating and physical activity (Kandula, Moran, Tang, & O'Brien, 2018). In the year 2012, 11 million people visited providers for obesity treatment alone (CDC, 2015), yet studies demonstrate inadequate counseling for lifestyle modification and the referral rate is unknown. (Kandula et al., 2018). Discussion with key stakeholders and patients has revealed that most of the adult population visiting primary care suffer from at least one obesity-related chronic condition (CDC, 2015). Yet, primary care providers continue to treat the

symptoms of the disease and not the underlying cause (Blackburn et al., 2015). This treatment of the symptoms alone reveals a disconnect from its underlying cause, which reveals the gap in communication of guidelines on the prevention and treatment of obesity and its related consequences (Kandula et al., 2018). A brief discussion on healthy eating and exercise often leave the patient overwhelmed and unclear in making lifestyle modifications to lose weight (Torti et al., 2017). At a busy private endocrinologist practice in South Jersey, many such factors contributed to the practice indicating the need for provider education and management to improve patient outcomes. Lack of knowledge, confidence, fear of alienating patients, stigma and time constraints for consultation are some of the noted barriers in providing obesity care (Blackburn et al., 2015). There is a clear need for a change of practice and implementation of education for providers in managing obesity.

The SWOT method, analyzing the strengths, weaknesses, opportunities, and threats (Waxman 2017), was used to assess the needs of the organization. Strength of the practice was the sizeable number of patients seen; weaknesses, lack of time to educate patients, limited education resources and the small number of employees; opportunity, changing provider behavior with education; threat to the practice, nil.

Problem/Purpose Statement

The DNP project was aimed at helping primary care providers overcome barriers to obesity treatment through education. Self-contained learning modules was used to provide an overview of the current evidence-based guidelines and recommendations for obesity management. Providers were empowered to then incorporate the knowledge gained from the educational intervention into their practice in treating patients with obesity.

The primary objective was to compare the preparedness of the providers before and after the implementation of the educational activity. A secondary objective was to describe the barriers and facilitators during the implementation period. Factors known to contribute to non-adherence: cultural, behavioral, technical issues, the content of the message, ease of use and time spent in completing the training was considered during implementation of the training (Houmanfar & Mattaini, 2016). Positive results of provider education aimed at changing behavior may foresee increased frequency and quality of obesity management in primary care practice (Stanford et al., 2015).

Clinical Question

The DNP project used the following PICOT question for its basis:

Does a 4-week educational activity influence provider knowledge and confidence in decision making and intent to use the information gained when assessing and treating patients with obesity in a primary care setting?

Objective and Aims

The aim of the project was to evaluate the confidence of primary care providers in discussing weight management with their patients. Providers were invited to complete an initial survey to demonstrate their current knowledge, thoughts, beliefs, and attitudes in obesity management. Following the survey, the providers were presented with a 4-week educational program on current information and modified tools. Education that will empower providers to deliver safe and effective treatment when managing obesity (Turner, Spruijt-Metz, Wen, & Hingle, 2015). At the end of the 4-week educational period, a post-survey and discussion were collected and the outcome analyzed.

This project was designed to make a meaningful difference by increasing provider confidence and knowledge to improve patient care. As the health status of much of the population is impacted by the explosion of the obesity epidemic, increasing numbers of co-morbidities associated with it are confronted. Therefore, addressing its source becomes a priority and requires maximizing effective obesity management in primary care.

Review of Literature

Patient care that is current and based on evidence, also termed as evidence-based practice (EBP), is an incorporation of the internal evidence from the practice with the research that has already been applied in a comparable setting (Dang & Dearholt, 2018). It is an assimilation of facts that are both internal and external that are designed to improve the quality of healthcare.

A systematic search to address the PCIOT question was performed using the key research databases such as CINNHAL, PUBMED, and MEDLINE for the years 2014-2019. The authors highlight the barriers and interventions in obesity management for primary care providers. An investigation of the literature showed a lack of knowledge, skills, and confidence as barriers in primary care providers and demonstrated how education can increase awareness and improve the quality of care.

Role of Primary Care Providers

Health trends in the United States continue to rise in obesity along with its accompanying complications, that is affecting every demographic universally or (US health trends rising towards obesity and its complication has universally affected all demographics.). Providers saw 11 million Americans in 2012 seeking treatment for obesity and its associated chronic conditions (CDC, 2015). The majority of the population visit their primary care provider as the first point of entry into the healthcare system. This can be effective and far-reaching; yet there is evidence of

limited impact on obesity management (Ard, 2015; Smith et al., 2015). Chronic diseases associated with obesity are highly prevalent and this co-occurrence can have a debilitating impact on the quality of life, treatments, and create financial strain. Americans reach out predominantly to their primary care provider (PCP) to seek treatments for managing their co-morbid conditions like hypertension, hyperlipidemia, diabetes, and pain that are associated with obesity. Earlier studies from Blackburn et al. (2015), Pool et al. (2015), and Stanford et al. (2015) found that patients expect their providers to discuss their weight and express frustrations in their PCP's inability to support them. Torti et al. (2017) continue by adding that patients clearly understood the role of primary care providers in weight management and anticipated support. Stressing the importance of comprehensive care, Janke, Ramirez, Haltzman, Fritz and Kozak, (2016) and Torti et al. (2017) found patients' expected their providers to treat obesity in the context of their co-morbidities, rather than giving a generalized advice (Stanford et al., 2015; & Torti et al., 2017). A clear association between provider success in helping patients to manage their weight and provider discussion of weight loss with their patients is demonstrated in studies conducted by Pool et al. (2014) and Tsai, Remmert, Butryn, and Wadden, (2018). Pool et al. (2014) in their study, imply that gestures as simple as acknowledging the patient's weight had shown to increase patient perception, thus motivating weight loss and behavior change.

Barriers

Primary care providers continue to face potentially modifiable barriers during consultations with patients. Several studies have attributed this to a lack of time during brief consultation (Asselin, Osunlana, Ogunieye, Sharma & Campbell-Scherer, 2015; Smith et al., 2015, & Stanford et al., 2015). Others have related the lack of acceptance that obesity is a chronic condition related to hormonal imbalance and missing the opportunity to diagnose

(Glauser et al., 2015; Kaplan et al., 2018.). PCP's inconsistencies about obesity as a chronic disease were further disclosed by Glauser et al. (2015) when almost all providers surveyed recognized obesity as a chronic condition, but more than half of the providers linked obesity to the absence of self-control. In a similar study in the pediatric population, Rhee, Kessi, Lindback, Littman, and El-Kareh (2018) found that while PCPs identify the significance of discussing weight during a well-child visit, less than 10% receive an ICD10 code for the diagnosis of overweight.

To improve obesity management, US government agencies and other independent national experts in disease prevention and evidence-based medicine have established guidelines; yet there is little awareness of those guidelines among PCPs (Glauser et al., 2015; Pasarica & Topping 2017). For instance, Smith et al. (2015); Torti et al. (2017); and Rhee et al. 2018 report providers have acknowledged that weight management is beyond their capability and that they cannot be effective on their own. Dewhurst, Peters, Deverex-Fitzgerald, and Hart (2016) in critically appraising 16 studies found providers feeling helpless and overwhelmed due to the lack of available medical options in weight management. Additionally, providers' lack of confidence, poor attitudes, beliefs, and ambiguity in their role in obesity management were found in the appraisal. Findings further implied that some providers believed commercial weight loss programs were more effective and even encouraged patients to join them. The American Academy of Pediatrics Committee on Nutrition, the Expert Committee Recommendations (ECR), and the National Initiative for Children's Healthcare Quality (Rhee et al., 2018) continue to endorse BMI as the screening tool, use of child growth charts and healthy lifestyle discussion in every well visit in the pediatric and adolescent populations. Additionally, the Healthcare Effectiveness Data and Information Set (HEDIS) 2009, announced pay-for-performance

reimbursement programs for BMI assessment and counseling of lifestyle modifications in the prevention of future diseases. Similarly, the Affordable Care Act (ACA), proposes to improve coverage for children by expanding access to services that promote a healthy weight. In spite of these directive, studies note providers identify obesity in less than 30% of children Rhee et al. 2018 and Dietz et al. (2015) in their systematic review found providers inadequately prepared in addressing patient beliefs and attitudes, behavior change process and in collaborating with other members of the healthcare team.

Primary care setting offers multiple opportunities to develop patient relationships to facilitate discussions on obesity and perform a continued reassessment of its management. Patients visit their PCP for many of the conditions connected to the root cause of obesity, yet PCPs fail to address it as the central point of the visit. In a randomized controlled study (RCT) Asselin et al. (2015) explore how PCPs integrate weight management in their daily practice. Data from the study present evidence that PCPs do not include obesity in their conversation with their patients. Dewhurst et al. (2016) add that provider frustration leads to prioritizing immediate concerns with co-morbid conditions of the patient, avoiding the topic of weight. Findings of the study further implicate the need for improved methods to utilize every visit of patient as an opportunity to initiate conversation and investigate the root causes of obesity. Blackburn et al. (2015) in interviewing providers found them hesitant in initiating and following a consistent approach to manage obesity. Dietz et al. (2015) found a clear need to improve the ability to initiate conversations about bodyweight, assess patient readiness to change and delivery of care. Delivery of the successful tools and approaches can equip providers to tackle the growing epidemic of obesity

Agencies like the CDC and USPSTF have defined guidelines that an individual with a BMI greater than thirty needs multicomponent intensive treatment starting with medications. However, Dutton et al. (2014) found that the diagnosis and counseling be started at a higher BMI (>35 kg/m^2), illustrating the presence of ambiguity among providers as to when to initiate weight loss medications with their patients. Glauser et al. (2015) found that providers failed to recognize the accepted parameter of a BMI >=30 kg/ m^2, missing the opportunity to start patients on pharmacotherapy. Granara and Laurent 2017, found uncertainty among providers when prescribing weight loss medications for long term therapy. More than half of the providers in the study did not favor pharmacotherapy as a treatment option. It is evident that PCPs need to be more aware of the prevention of chronic conditions caused by obesity. Glauser et al. (2015) found providers need more confidence in the safety and efficacy of the currently available weight loss medications. Among the providers who did use pharmacotherapy, a significant number of them were unclear about its results, anticipating greater weight loss than normally achieved. The study further revealed that the providers failed to fully understand the medication's mechanism of action and the safety and efficacy of the approved weight loss drugs, highlighting the gap in knowledge.

Education

Research in the past has been guided by experiences or observations lacking scientifically verifiable evidence and without consideration of the theoretical underpinnings of implementation (Nilsen, 2015). This lack of foundation in understanding what worked, and what did not, limit the possibilities of achieving successful implementation and in developing guidelines to achieve further successful implementation. Professional practice in healthcare faced difficulties in using evidence-based knowledge until guidelines with rationale for strategies were structured for

implementation. This has been the basis of creating theories, models and frameworks. Nilson 2015 defines theory as a methodical principle aimed to organize the observations, understandings, and explanations. Elements of this structure include variables, domains, relationships and derived predictions guiding specific events.

Provider training and education are essential along with the changes in the delivery of care (Deitz et al., 2017). Obesity's effects on individuals' social, psychosocial, emotional, and contextual dimensions are significant, requiring multiple skill sets to promote prevention and treatment (Ogunleye et al., 2015). Primary care in the healthcare system can be significantly effective in disseminating interventions on a very large scale. Being the only point of care for many patients, the PCP can have a direct influence on obesity management. Stanford et al. (2015) in their cross-sectional survey discovered providers with obesity education had a greater impact on treatment options and considered multiple modalities for their patients. Sanchez-Ramirez, Long, Mowat, and Hein (2018), found that a one-day interprofessional obesity education activity increased provider skills and attitudes. Furthermore, a follow-up survey after six months revealed that providers continued to effectively utilize their training over time. Pasarica & Topping (2017) in their efforts to advance obesity management developed an educational resource, which was used as part of an in-class exercise. Feedback from most of the participants strongly showed an increase in knowledge and confidence. As a result, the providers gained a better understanding of the role of other healthcare professional as valuable resources. Providers can tap into these resources when they need to refer their patients for further treatment. Sturgsis, Haesler, Elmitt, Weel, and Douglas (2017) demonstrated an increase in PCP's confidence and change in provider attitudes through training. Over the course of one year, the study provided four half-hour scheduled trainings, covering detailed guidelines in obesity

treatment. PCPs who received the training demonstrated an increase in confidence and self-efficacy. This further led to a change in beliefs and attitudes guiding their practice change. PCPs reported higher confidence in using their new skills in asking and assessing patients for obesity management. They felt more comfortable discussing weight and management alternatives. This positive experience in managing patients reflects on the PCPs' improved self- efficacy in bringing change in patient behavior. Bhuyan et al. (2015), in their literature review, included intervention training, resulting in encouraging changes emphasizing that well-prepared PCPs are imperative to delivering successful interventions to their patients. Additionally, the studies showed PCPs were able to adapt to and utilize the interventions more frequently. The success of the training in the study suggests that educational activity improved the skills and knowledge of the providers.

Maguire, Li, Cunich, and Maloney (2019) examined an online clinical training for providers on treating patients with eating disorders. The program sought to educate providers on identification, assessment and management of people with eating disorder. Upon completion of the training program, investigators found significant increase in confidence, knowledge, and skills to manage eating disorders. Kolko et al. (2016), assessed and proved live and web training methods in obesity screening and initial goal setting achievable. Asselin et al. (2015) in their study found providers implementing obesity treatments approaches and tools provided during training, increasing the assessment of the root causes of obesity and working with patient goals. Rueda- Clausen et al. (2013) in their implementation of tools in obesity education facilitated weight management through improved provider-patient communications, assessments for obesity and follow-up plans in primary care. A ninety-minute training with this tool almost

doubled the number of interactions between provider and patient even when consultations were for reasons other than obesity.

Globally, prevention in obesity has taken precedence for many of the health promotion agencies. In this effort, methods like motivational interviewings have been studied to evaluate provider learning and improve skills. Edwards, Stapleton, Williams and Ball (2015) in a quasi-experiment of 163 providers evaluated the impact of one such motivational interviewing training to promote behavior change specifically in nutrition and exercise. Measurable advances in confidence, skills, and knowledge were noted from the pre and post demonstrations. Follow up records of providers showed these improvements unchanged over time. In a similar study by Resnicow et al. (2015), the effects of provider training in motivational interviewing resulted in BMI reduction in patients. The study presents clear implications that education can help the provider attain the needed confidence, knowledge, and skills in overcoming the growing challenges from the obesity epidemic.

Dietz et al. (2015) reviewed published literature on weight management in adults and children and emphasized the importance of understanding that the seriousness of the disease dictates the course of its therapy. PCPs' have an important role in health promotion, bringing changes to lifestyles that promote disease prevention and improve health. For instance, they have been instrumental in promoting smoking cessation and immunizations in their practice. However, when it comes to obesity management, PCPs' tend to assign care to other health providers. Patients are compelled to keep obesity management within the primary care setting because of accessibility considerations, patient preference, and medical costs. Hence, it is pertinent for PCP to be equipped to meet the demands of the rising epidemic. Continued study on obesity by researchers produce more and more useful guidelines and tools for practice for the

PCPs. One way of disseminating this knowledge from research to the PCPs is through education and awareness. In spite of available structured guidelines, there remain barriers, that are modifiable, for weight management in primary care settings. The literature presents the need for education and the delivery of structured recommendations to help overcome barriers. Flodgren (as stated in Dietz et al., 2015) found that education of primary care providers can reduce the average weight of patients by 1-2 kg per year. Jannah et al. (2018) realized that training and education of PCPs' increases the provision of medically appropriate obesity treatment and management to improve patient health outcome.

Theoretical Framework

PCPs realize the significance of research and its effect in everyday practice but find it challenging to translate the best evidence available into real-life interventions in a timely fashion. This gap in translating the knowledge into actionable interventions can significantly impact the treatment of their patients. The process of knowledge translation requires collecting, analyzing, coordinating and finally delivering related information to the PCP in improving their skills and confidence in their interventions. Translation of knowledge can be defined as transferring the available evidence-based knowledge that has been already created into a meaningful, user-friendly and easily accessible tool for everyday use in practice (Shahmoradi, Safadari, & Jimma, 2017). This process of bringing the current evidence created in research into action is pertinent to delivering effective care and bridging the knowledge gap. Proper implementation of the findings of the research can help PCPs and patients understand alternatives in treatment, risks, and benefits to make informed decisions.

The Knowledge to Action (KTA) framework, developed by Graham et al. (2006), describes the moving of knowledge from research into action in practice. The framework was developed after reviewing action theories on change processes predominantly from nursing. The findings of the review proposed a conceptual framework to clarify the essential elements of the KTA process. The KTA framework embraces two different related elements: (i) The knowledge creation (symbolized by the funnel in Fig 1) enclosed by (ii) the Action Cycle (figure 1). Each element contains multiple phases that overlap and can be repeated. Each phase can impact the other creating a dynamic interaction among them. The ‘knowledge phase’ can sway the action phase that can be acted out in sequence or at the same time. The ‘action cycle’ skeletons

activities for knowledge application within the context of and after careful assessment of the process. Adapting to the need of the stakeholders involved is fundamental in this process. In summary, KTA can be characterized as follows without a ranking order:

- Includes all steps following the creation of new information
- Highlights knowledge that is research-based.
- Multidirectional and interactive
- Continued collaborations and interdisciplinary
- Nonlinear with several activities
- With a diverse user group
- Based on the needs of the user
- Results oriented.

This project aimed to translate knowledge to action using KTA as a guide. With KTA as the means of transferring, the goal was to translate evidence-based information that is relevant to obesity treatment in the primary care setting. The objective was to ensure the dissemination of guidelines from the evidence base to the clinical practice, thus reducing the gap, paying close attention to its users and involved parties. Using the "knowledge funnel" of the framework, current knowledge gathered into guidelines followed by the "action cycle" to ensure usability to the context at hand, obesity management. The objective was to provide PCPs resources to use with their patients regarding weight management in primary care. The framework is a continuous process that can be best described by the original diagram of Graham et al. (2006).

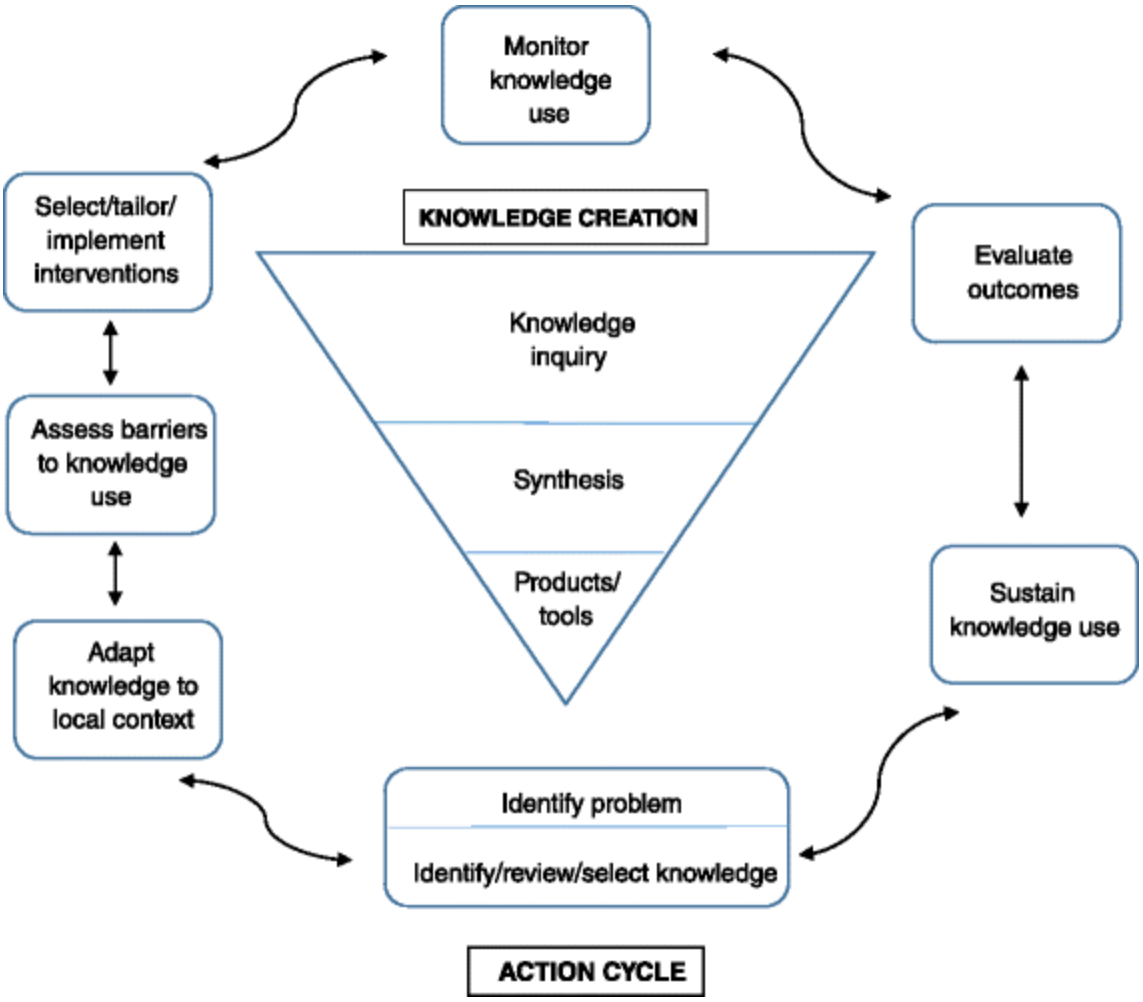

Figure 1: Knowledge to action process.

Reprinted from Graham, I. D., Logan, J., Harrison, M. B., Straus, S. E., Tetroe, J., Caswell, W., & Robinson, N. (2006). Lost in knowledge translation: Time for a map? *Journal of Continuing Education in the Health Professions,26*(1), 13-24. doi:10.1002/chp.47

Methodology

This quasi-experimental project used a pre and post survey designed to measure the effects of the obesity management education program. The design enabled testing of the participant's knowledge, attitudes and beliefs about weight management in their patients.

Setting

The setting for this project was [redacted], a for-profit Medicare and Medicaid certified endocrinologist's office located in southern New Jersey. The practice treated approximately 9, 680 established patients with varying levels of healthcare need. Patients were grouped into four categories based on their initial reason to seek care. The categories were comprised of 1) Diabetic, 2) Thyroid, 3) Obesity 4) Cross-Gender. Of the total population, the first group diabetics, both type 1 and type 2, were 45% of the population, the second group, the thyroid patients were 25%, the third group, obese patients were 25% and the fourth group, transgender patients were 15%. The practice used both electronic and paper techniques for data collection and storage.

This project included a purposeful sample of men and women of the medical internship program established by [redacted] Potential participants for the internship program were identified through community network and word of mouth. Information about the internship program was provided before the application process. Potential interns from the applicants, received from around the world, were randomly selected for the allocated seats. The duration of the internship was four weeks, and therefore a new set of interns will be given the opportunity each month. This project implemented the educational activity every four weeks for three sets of interns intending to reach a sample size of 20.

Inclusion Criteria:

The inclusion criteria for the interns were 1) admission into the internship program of [redacted], 2) in their final year of their education in primary care, 3) who interact with patients, and 4) who volunteered and gave consent to participate in the quality improvement project.

Exclusion Criteria:

Those excluded were 1) those who did not speak English 2) those who did not interact with patients, 3) those who did not have access to the internet and the web and 4) those who did not consent to participate in the project.

Recruitment Process:

Recruitment flyers were displayed in the office-staff area and conference rooms by the Co-PI and office staff. Recruitment were conducted before the start of the internship program by the Co-PI via email and in-person. The participant's email address were obtained from the organization. An initial email detailing the study was sent out followed by the in-person meeting at the practice site before the start of the internship. The consent process began once the intern agreed to participate in the study. A summary of the project with contact information, email address, and telephone number of the Co-PI was provided. The participants were informed that their participation is completely voluntary and supplementary to the internship. Their decision to enroll in the project did not impact their internship in any way. The duration of the internship program was four weeks, and therefore this recruitment process was conducted each month for additional participants to achieve a total of 15 participants. Copies of the recruitment materials can be found in the Appendix A.

Consent Procedure:

Currently enrolled in the Doctor of Nursing Practice (DNP), at Rutgers; School of Nursing, the Co-principal Investigator had the overall responsibility for the project. This project intended to make a meaningful difference in patient care by increasing the knowledge and confidence in obesity management among primary care providers. A brief survey was administered to the participants; to evaluate their current knowledge, attitudes, and beliefs regarding weight management. After the survey, an educational activity based on current evidence-based guidelines and tools was administered via an interactive web-based module. Weekly collaborations on the topics presented in the educational activity were conducted via phone conference and/or in person group discussion. The project lasted for the duration of the internship program, every four weeks for three sets of interns. Towards the end of the fourth week, the participants were presented with the same survey presented initially, to evaluate the impact of the educational activity. The goal of the project was to increase the quality of care by increasing knowledge and changing practice regarding weight management. The participant at any time during the project were allowed to decide to end his or her participation without any consequences.

Participation in this study posed minimal risk. Each participant was assigned a number that enabled data analysis without any direct link to their name. Only the Co-PI had access to the listing of the assigned number. Participant discomfort of any kind was not anticipated in the project. There was no direct benefit, costs or monetary compensation from taking part in this project. However, light refreshments were provided during group discussions. The alternative was not to take part in the study. During the project, participants were notified of all new information that may affect their willingness to continue in the project.

Study Activity:

A survey created by Sanchez-Ramirez et al. (2018), (Appendix B) was utilized to gather data for the goals of this project. This survey was administered to the participants at the beginning of their internship program at [redacted], as the pre-test, followed by the educational activity and again at the end as the post-test. A tool created by Pasarica and Topping (2017), was utilized as the educational activity. The tool included up-to-date guidelines and evidence-based recommendations in obesity management. Components including healthy lifestyle management, lifestyle interventions, pharmacological and bariatric surgery were detailed based on evidence and resource information for further learning. Additionally, popular myths were discredited by evidence-based research data. Practice recommendations were made available at the end of the module for the providers to utilize in their fifteen-minute patient consultation. After the completion of the module, multiple-choice questions tested the knowledge of the participants. This project used a learning module that can be viewed on any browser that supports HTML and steered by the learner (Overview Appendix C).

Outcomes

Data were collected both before and after the educational activity. Learning outcomes was assessed using Kirkpatrick's model to consider whether the intern's acquired the intended knowledge, skills and attitude.

Instruments

Microsoft Excel was used to track all needed information including 1) a separate file to track demographic information, and results of the pre-survey and post-survey. This file also had information on any participants who exited the study before its completion and their attendance in the group discussions. The survey for pre and post-activity utilized in this project is detailed in Appendix B. This survey is a creation of Sanchez-Ramirez et al. (2018), for his study and included questions on perceived skill level, professional attitudes, and challenges towards obesity intervention.

An interactive web-based learning module developed by Pasarica and Topping (2017), (overview presented in Appendix C), was utilized as the activity. The module included current evidence-based guidelines and recommendations in obesity management for primary care providers and detailed healthy lifestyle management, lifestyle interventions, pharmacological and bariatric surgery. Resource information for further learning, and practice suggestions for providers to utilize inpatient consultation were also included.

Project Timeline

Activity	Plan Start	Plan Duration	Periods
			May-19 | Jun-19 | Jul-19 | Aug-19 | Sep-19 | Oct-19 | Nov-19 | Dec-19 | Jan-20 | Feb-20 | Mar-20 | Apr-20 | May-20
Presentation of Project Proposal to team	May-19	1	
IRB Submission	May-19	3	
Participant Recruitment	Aug-19	1	
Project Implementation	Sep-19	3	
Data Collection	Nov-19	2	
Data Analysis	Jan-20	1	
Evaluating and Writing	Feb-20	2	
Presentation of Final Project	Apr-20	1	
Graduation	May-20	1	

Resources

The Co-PI was solely responsible for all the costs associated with the project. Costs included flyers produced to recruit participants, handouts and refreshment costs during group discussion. Budget costs displayed in Appendix D.

Evaluation Plan

The overall goal of this project was to assess the current knowledge, attitudes, and beliefs in a pre-survey that was conducted followed by an educational activity, interactive web-based module, phone conversations, and in-person group discussions. After the educational activity, the participants were administered the same survey as a post-test to evaluate change. The basic demographics of the participants including gender, age, ethnicity, self-described weight and rankings of the various were collected. Perceived skills were rated from 1 (low) to 3 (high); while professional attitudes and perceived challenges rated using a 5-point Likert scale with 1

(lowest number) indicating "strongly disagree" and the 5 (highest number) representing "strongly agree" (Sanchez-Ramirez et al., 2018). This educational module exposed learners to an extensive review of current evidence-based guidelines for practice in their primary care practice. Data collected after the activity helped to answer the PICOT question of this project, "Does education influence provider confidence in decision making when assessing and treating patients with obesity in a primary care setting after a four-week educational activity?"

Data Analysis Plan

Kirkpatrick's model (level 2) was used to evaluate whether the participants increased their knowledge, skills or attitudes through participation in the educational activity by collecting data both before and after the learning modules (Kirkpatrick & Kirkpatrick, 2012; Mowat et al. 2017). Descriptive statistics was used to present the demographic information of the participants including gender, age, ethnicity and self-described weight. Wilcoxon matched pairs test (*z*) will examine *variations* after being exposed to the educational activity. Correlation between participant characteristics and pre-and post-activity changes in perceived skills and professional attitudes was attempted.

Data maintenance & Security

All efforts was made to keep personal information in the study record confidential, but total confidentiality was not guaranteed. The excel workbook containing the names of the participants were given an identification number (ID). All data collected prior to de-identification was in the possession of the Co-PI solely. The computer that was used was password protected and was the sole responsibility of the Co-PI. Only the de-identified data was shared with the DNP project team members. The de-identified data was shared with the

administrative staff at the site of [redacted]. The data shared did not have any information that will identify the participants in any way

Upon completing of the project, closure of the IRB, and final writing of the manuscript all information was destroyed in accordance with the guidelines established by Rutgers University. Hard copies of the consents and collected data was scanned to a flash drive that will be housed at the office of the chair of the DNP team, at Rutgers University according to guidelines of IRB.

Analysis

Learning outcomes were evaluated using Kirkpatrick's model which reflects the participants gaining the intended knowledge, skills or attitudes based on their completed activity both before and after the learning activity. Possible differences following the educational activity were explored using Wilcoxon matched pairs test (z). Effect sizes (r) =z/n––√(number of pairs)z/n(number of pairs) were calculated ($r \leq 0.1$ = small effect, $r = 0.3$–0.5 = moderate effect and $r > 0.5$ large effect). Statistical significance was accepted for p-values< 0.05. All analyses were performed using SPSS version 24.0 (IBM Corp., Armonk, NY, USA).

Results

Originally, this project was expected to be implemented every four weeks for three sets of interns expecting to reach a sample size of 15. Due to internal changes made by the organization, the allocated seats for the medical internship program varied resulting a sample size of 20 at the end of project implementation. A total of twenty interns answered the pre-activity survey and also completed the post-activity survey following the educational activity.

Descriptive Findings

Twenty interns answered the pre-activity (100% of the total participants). Of these these, 55% were females, 45% were males, 100% interns in their last year of education, and 80% considered themselves normal weight (Table 1). All participants (100% of the total attendees) who answered the pre-survey also completed the post-activity survey immediately following the activity. Majority of the participants (more than 80%) of the population refrained from disclosing ethnicity and therefore this data was not reported. After the activity only 50% of participants assessed themselves as normal weight, a notable reduction from 80% reported in pre-survey, a statistically significant value p=0.014.

Perceived skills

Statistically significant post-activity increases in perceived skills were found (Table 2). Participants reported increases in their ability to assess weight status and associated risk factors ($r = 0.58$, $p = 0.001$), to address weight management issues with patients ($r = 0.51$, $p = 0.001$), to teach/motivate patients toward physical activity ($r = 0.33$, $p = 0.034$) and healthy eating practices ($r = 0.22$, $p = 0.157$), and to use behavior modification techniques ($r = 0.61$, $p < 0.001$). A significant increase in practitioners' ability to deal with family issues about weight management was found post-activity ($r = 0.38$, $p = 0.014$). For comparison of the pre and post responses a frequency was calculated shown in Table 3.

Professional attitudes

The post-activity survey for professional attitudes (Table 2) showed that practitioners felt that obesity is part of their scope of practice (r = 0.47, p = 0.003), felt their important role to intervene and not just raise the topic (r= 0.45, p = 0.004), realized having enough time to deal with the issue of obesity (r = 0.51, p = 0.001), felt obesity less difficult (r = 0.42, p = 0.007), felt

less overwhelmed on the issue (r = 0.44, p = 0.005), felt more confident that any obesity intervention attempt will make a significant difference ((r = 0.44, p = 0.005), feel sufficiently educated or competent in obesity intervention strategies (r = 0.54, p = 0.001), learned to whom to refer patients for obesity interventions ($r = 0.51$, $p = 0.001$), were more comfortable discussing obesity with their patients ($r = 0.49$, $p = 0.003$), were less likely to avoid the topic of obesity in order to not offend patients or jeopardize their relationships with patients and/or family members ($r = 0.46$, $p = 0.004$), and were less frustrated with the low success rate in managing obesity ($r = 0.50$, $p = 0.001$), felt that patients will be more compliant in any obesity intervention efforts attempted and will have an impact (r = 0.50, p = 0.001), felt the need to address obesity issues with patients even when they do not look or act sick (r = 0.52, p = 0.001), and felt that talking about obesity could not do more damage, leading patient toward an eating disorder or other psychological problem (r = 0.53, p = 0.001). (Table 2). For comparison of the pre and post responses a frequency was calculated shown in Table 3.

Perceived challenges

All participants agreed both in pre and post activity that obesity training was not taught before entering practice. They felt there were increased availability of professional training in this area (r= 0.62, p < 0.001), learned about adequate compensation for treating obesity (r = 0.56, p < 0.001), recognized available referrals (r = 0.56, p < 0.001), learned about available resources for materials to distribute to patients (r = 0.55, p < 0.001), learned about available guidance toward raising a sensitive issue such as obesity with patients (r = 0.58, p < 0.001), and learned about guidance available in motivational interviewing for behavior change related to obesity (r= 0.56, p < 0.001). (Table 2). For comparison of the pre and post responses a frequency was calculated shown in Table 3.

Discussion

The study identified topics related to obesity management and learning that may help providers change behavior and improve their practices when treating obese patients. Provider barriers and knowledge gaps to weight management were addressed through the learning activity. Active engagement of the provider in activity that is applicable and context-appropriate is pertinent in changing behavior (Pasarica & Topping, 2017). Outcomes of the activity presented an improvement in professional skill, attitudes and a decreased sense of challenges in healthcare providers caring for those who are obese or at risk for obesity. Primary care providers today face the burden of obesity management as patients visit for advice on weight loss and attend clinics on chronic conditions related to their weight (Haslam, 2014). Their initial challenge is to effectively initiate and engage patients in managing their obesity. Therefore, this important role in prevention and obesity management stresses the need to offer educational activities and resources to help providers tackle the obesity epidemic. The positive results found suggest that this educational activity supported the knowledge and training needs identified by healthcare providers in earlier studies and could be sourced for guidance of future educational activity in management of obesity (Sanchez-Ramirez, et al. 2018)

It is important to highlight that the interns reported increased knowledge when it comes to referring patients for obesity intervention, validating learning about the various roles of healthcare professionals in obesity management. This further strengthens Sanchez-Ramirez, et al. 2018, postulation that obesity management presents a special challenge that can be overcome with a collaborative approach. In addition, positive results of the activity support previous studies in highlighting the importance of ongoing development and implementations of continuing education that focusses on obesity prevention and interventions. Long term effect of

this educational activity should be explored in future research by looking at quality of care and patient outcomes.

Overall, the activity proved positive for the majority of the participants, resulting in self-reported change in practice. Previous studies suggest that providers experience barriers in obesity management and lack adequate weight management knowledge (Ogunleye et al. 2015). Reducing the barriers and knowledge gaps in providers may improve the quality and frequency of obesity management in primary care practice.

Limitations and Strengths

Some limitations of the study should be considered. First, is the alteration of behavior among participants due to their awareness of being observed, otherwise known as the Hawthorne effect, may have contributed to the post-activity improvements. In-spite of the small number of participants in the study who could have diminished the statistical power, meaningful gains remained at the end of 4 weeks. These gains demonstrated supporting evidence of the positive effect of the educational activity. Second, although the study was designed to progress gradually on a weekly basis with a learning activity and its discussion, it is unknown if participants followed the gradual process or waited till the last week to complete the entire activity and then attempt the post survey. This suggests that the results of permanency of knowledge of should be translated with caution. Third, fewer years of participant experience in clinical practice, limited exposure to barriers to care and their role in primary care could have influenced the results. Fourth, a small number of participants in surveys may affect the generalizability of the findings. Therefore, there is a need for future studies using a larger number of participants that is aimed to explore the effect of this educational activity. Fifth, there is a possible impact of the relation between the participant and their interest in the topic. Often

healthcare providers attend continuing education programs that interest to them, subsequently creating an interest bias (Sanchez-Ramirez et al. 2018). Finally, articles in languages other than English were not explored. Results of this study brings awareness of the professional skills, attitudes, and perceived challenges of healthcare providers in obesity management.

Implications and Recommendations

Healthcare Policy

Reimbursement policies related to services of obesity treatment significantly impact provider participation (Jannah, et al. 2018). There is a notable association between policy maker's recognition of obesity as a chronic disease and the reimbursements of its services. Similarly, there exists a direct correlation between limited guidance and the approach of the health professionals in addressing obesity with their patients (Jannah, et al. 2018). Increased positive health outcomes can therefore originate from defining treatment coverage and up-to-date provider guidance. Educating lawmakers and plan administrators in understanding obesity as a chronic illness, could be an effective approach for all.

Care delivery is significantly affected by Federal and State policies. The availability of preventative obesity screening at no additional cost offered by the Patient Protection and Affordable Care Act, is an example of expanding Medicaid to more low-income adults (healthcare.gov). Obesity counseling and behavioral management including referrals are covered services as recommended by the U.S. Preventative Services Task Force. Dietz, et al. (2017), reports that with the shift of Medicaid and Medicare to value-based care, increased incentives will be available for clinical systems to identify interventions that prevent or stabilize obesity and other chronic conditions. One such example is The Affordable Care Act directive for nonprofit hospitals to invest in community health improvement activities (Rosenbaum et al., 2015).

Education

Obesity continues to be an epidemic in our nation's multiple adverse medical complications and increasing related costs. Kaplan et al. (2018) states that continued education of health care provider can be the possible first step in changing health care provider beliefs and treatment practices. The overall content of the educational activity and the survey includes treatment of obesity in all age groups. The study reveals modifiable attitudes and barriers and when corrected can bring more effective obesity management. Training needs identified in earlier studies support the results of the learning activity suggesting future usability of this this design and content in guiding future educational programming in obesity management (Sanchez-Ramirez, et al. 2018). Although a cause and effect cannot be identified for each attitude and barriers, the data can provide guidance for future research needed to overcome them.

The correlation between the chronic illness and obesity is well established and therefore need to be a part of the patient-provider conversation. With the emphasis on prevention, training based on clinical presentation of obesity is crucial, as weight is not often cause of the patient's visit (Asselin, et al. 2015). Obesity management when embedded in routine patient visit for other conditions can be more effective.

The apparent finding is the need to address the knowledge uncertainty of role of primary care provider in obesity management. Provider behavior is key in any primary care intervention to manage weight and decrease risks for chronic illnesses. While studies have demonstrated that PCPs' management of obesity is low, the activity used in this study helped PCPs to improve their management of obesity. This is a promising finding that builds on existing evidence of the importance of multifaceted strategies, ongoing training and availability of resource. The study also found that PCPs are willing to overcome barriers to obesity management. Tanda, et al.

(2014) stresses the need of future efforts in governmental, institutional and insurance policy changes that will include preventative programs including continued provider education and user-friendly documentation and reimbursement systems.

Economic

The American Diabetes Association (2018), reports 2017 saw $327 billion as the total estimated cost of diagnosed diabetes with $237 billion in direct medical costs and $90 billion in reduced productivity. Although preventable, this chronic disease is one among the most common and exorbitant of all health problems. Effective systems of screening at-risk populations, and strategies for managing existing diseases and related complications can help overcome the epidemic. The first sign of success from these measures is reported by CDC (2019), with a 35% decline in new cases of diagnosed diabetes in the US, or 1.3 million new cases per year in 2017 compared to 1.7 million new cases in 2008. CDC in their press release announced their new report saw the longest decline in new diabetes cases and a persistent plateau in cases of diagnosed diabetes.

Similar success is highlighted by the efforts of American Heart Association (AHA), in controlling high blood pressure and its related serious health conditions. Target BP program, implemented by AHA throughout primary care practices in Western New York educated providers and provided continued access to a comprehensive resource including AHA/ACC/CDC Hypertension Treatment Algorithm, the AMAs' Measure, Act, Partner (MAP) Checklist, Community Health Worker training, in person technical assistance, and an online portal complete with webinars. While Aspire of Western New York, the practice where Target BP has been implemented, saw an 89% success rate, i.e. 234 out of the 263 patients who were diagnosed with high blood pressure now have their blood pressure under control, the other

practices noted reduced racial and ethnic disparities through the use of standardized treatment protocol offered by the program (CDC, 2019). Continuous training to gain knowledge can become a lasting process within the practice and can improve patient interactions. Such examples indicate strategies implemented are efficient and with continued efforts will curtail the medical costs of obesity treatment and its related chronic illnesses.

Sustainability and Future Scholarship plan

This study builds on existing evidence, the importance of applicable measures for managing obesity and improving access to care for obese patients. The increasing epidemic obesity in our nation that leads to multiple adverse medical complications can be overcome through effective treatment guidelines that are available to help patients lose weight and to decrease risk for chronic illness and their associated comorbidities. Continued education focused on helping PCPs overcome their identified knowledge gaps in the area of obesity management should include motivational interviewing, nutrition, bariatric surgery, and pharmacotherapy for weight loss. The activity used in this study helped PCPs improve their management of obesity. The study also found that PCPs are willing to consider the barriers they have to obesity management and try to overcome them.

The activity in the study demonstrated its usability in the future or as a collaborative exercise with further case studies from clinical experience. Adding simulation to managing patients with obesity, both before and after the session, can create effective learning. With new research, ongoing updates to existing guidelines is crucial to ensure providers are current in their treatment practices. Periodic review and revision of the resource and end user notification will be key to the success of the activity. This will ensure the dissemination of guidelines from the evidence base to the clinical practice, thus reducing the gap, paying close attention to its users

and involved parties. As guided by Graham et al. (2006), Knowledge to Action framework, this "knowledge funnel" of the framework, current knowledge gathered into guidelines followed by the "action cycle" to ensure usability to the context at hand, obesity management. The aim is to provide PCPs resources to use with their patients regarding obesity management in primary care. Positive results in provider education aimed at changing behavior may foresee increased frequency and progress in managing obesity in primary care practice (Stanford et al., 2015).

Professional Reporting/Plans for Future Scholarship

The goal of the project was to stimulate similar processes of ongoing needs assessments and guiding providers to deliver quality care to their patients. The project's design will enable ongoing evaluation, translation and dissemination of new research into practice. Practices can further collaborate with other professionals to compare and evaluate processes and their impact, capture data and recommend sustaining change at organizational levels. Appraisal of the practice policies regarding health will help demonstrate cost savings with change. The DNP project highlighted the importance of continued education and updated access to new research and guidelines. With education practices can develop advanced competencies for increasingly complex practice and enhance knowledge to improve practice and patient outcome. Access to current research and guidelines can enable practices to critically analyze the existing health policies and advocate change with the goal of improving patient outcome. American Association of College of Nursing stresses the significance of consistent changes in organizational arrangements, professional culture and financial structure to maintain a sustainable and measurable improvements in practice. This DNP project can serve as an example to demonstrate evidence-based methods to self-assess existing practices and create systems to mentor and guide through complex transitions to develop and implement standards of care.

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Appendix A:

Flyer for Participant Recruitment

Participation in Doctor of Nursing Practice Project (DNP)

All interns are invited to participate in a DNP project that is conducted by Aliya Fayazi who is a student at Rutgers University, School of Nursing, Newark Campus.

The purpose of this DNP project is to determine if providing education can influence provider knowledge and confidence in decision making and intent to use the information gained when assessing and treating patients with obesity in a primary care setting.

This project is confidential, which means that I will not record any information about you that could identify you. There will be no linkage between your identity and your response in the DNP project.

Participants who consent will complete a pre-survey, and participate in an educational activity followed by a post-survey over a four weeks period.

Consent forms are available through the DNP student.

CONSENT TO TAKE PART IN A STUDY

TITLE OF STUDY: Does a 4-week educational activity influence provider knowledge and confidence in decision making and intent to use the information gained when assessing and treating patients with obesity in a primary care setting?

Principal Investigator: Aliya Fayazi, RN, BSN

STUDY SUMMARY:

This consent form is part of an informed consent process for a study and it will provide information that will help you decide whether you want to take part in this study. It is your choice to take part or not. The purpose of the study is to complete the requirement for the doctoral degree of DNP and increase the level of confidence by providing education and tools for obesity management. If you take part in the study, you will be asked to complete a pre-survey, followed by an educational activity that includes a web-based interactive learning module and weekly group discussion and or phone conversation with the Co-PI. After the completion of the educational activity, you will be asked to take the post survey. The goal is to assess and strengthen the confidence level of primary care providers in obesity management. Your time in the study will take 20 minutes to complete the initial survey, 30 minutes for the learning modules a bi-weekly 60-minute in-person group discussion and a 20-minute post-survey at the end of four weeks. There is no anticipated harm in taking part in the study and no direct benefits from participation. An alternative to taking part in the study is not to take part in it.

The information in this consent form will provide more details about the study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part, you should feel free to ask them and should expect to be given answers you completely understand. After all your questions have been answered and you wish to take part in the study, you will be asked to sign this consent form. You are not giving up any of your legal rights by agreeing to take part in this study or by signing this consent form.

Who is conducting this study?

Aliya Fayazi, RN, BSN is the Co-Principal Investigator of this study. A Co-Principal Investigator has the overall responsibility for the conduct of the study. However, there are often other individuals who are part of the study team.

Aliya Fayazi may be reached at Phone number: [redacted] and email address:

[redacted]

The Principal investigator or another member of the study team will also be asked to sign this informed consent. You will be given a copy of the signed consent form to keep.

Why is this study being done?

The purpose of the study is to complete the requirement for the doctoral degree of DNP and increase the level of confidence by providing education and tools for obesity management.

Who may take part in this study and who may not?

Inclusion criteria for the interns will be

1) admission into the internship program of [redacted],
2) in the final year of their education in primary care and

3) will interact with the patients
4) volunteer and gave consent to participate in the quality improvement project.

Exclusion criteria for the intern will be

1) non-English speaking,
2) do not interact with the patients,
3) do not have access to the internet and the web and
4) do not consent to participate in the project.

Why have I been asked to take part in this study?

All interns at [redacted] during the month of project implementation are invited. This invitation is extended to you as one of the interns at the organization.

How long will the study take and how many subjects will take part?

The study will last four weeks, the duration of your internship. Five participants will be recruited each month for three months for a total of 15 people.

What will I be asked to do if I take part in this study?

- Pre-survey questionnaire before the start of the internship
- Complete a web-based interactive learning module at your own pace
- Participate in group discussion and in a phone conversation with the Co-PI
- Complete a post-survey questionnaire at the end of the intern

What are the risks and/or discomforts I might experience if I take part in this study?

This is no risks anticipated when taking part in this study.

Are there any benefits to me if I choose to take part in this study?

You may not receive any direct benefit from taking part in this study.

What are my alternatives if I do not want to take part in this study?

There are no alternative treatments available. Your alternative is not to take part in this study.

How will I know if new information is learned that may affect whether I am willing to stay in the study?

During the study, you will be updated about any new information that may affect whether you are willing to continue taking part in the study. If new information is learned that may affect you after the study or your follow-up is completed, you will be contacted.

Will I receive the results of the study?

In general, we will not give you any individual results from the study. We do not anticipate finding any urgent medical information as the study only intends to collect your name, gender, and ethnicity.

Will there be any cost to me to take part in this study?

There will be no cost to you in participating in the study.

Will I be paid to take part in this study?

You will not be paid to take part in this study.

How will information about me be kept private or confidential?

All efforts will be made to keep your personal information in your study record confidential, but total confidentiality cannot be guaranteed. The excel workbook containing the names of the

participants will be given a random identification number (ID). To permanently de-identify the names, the ID numbers will be copied over the names, with the action "Paste Special" in a second workbook that will be used for data manipulation. All data collected prior to de-identification will be in the possession of the Co-PI solely. The computer that was used will be password protected and will be the sole responsibility of the Co-PI. Once the id numbers are pasted over, all information of the participants will be totally de-identified with no way to recover. Only the de-identified data will be shared with the DNP project team members. The de-identified data may be shared with the administrative project at the site of [redacted]. The data shared will not have any information that will identify the participants in any way.

What will happen to my information or biospecimens collected for this study after the study is over?

The information collected about you for this study will not be used by or distributed to investigators for other studies.

What will happen if I do not wish to take part in the study or if I later decide not to stay in the study?

It is your choice whether to take part in the study. You may choose to take part, not to take part or you may change your mind and withdraw from the study at any time.

If you do not want to enter the study or decide to stop taking part, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled.

You may also withdraw your consent for the use of data already collected about you, but you must do this in writing to the Co-PI Aliya Fayazi, email: [redacted]

Who can I call if I have questions?

If you have questions about taking part in this study or if you feel you may have suffered a study-related injury, you can call the study Co-PI Aliya Fayazi, email: [redacted]

If you have questions about your rights as a study subject, you can call the IRB Director at:

Newark Health-Science (973)-972-3608; or the Rutgers Human Subjects Protection Program at (973) 972-1149.

AGREEMENT TO PARTICIPATE

1. Subject consent:

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name:_____

Subject Signature:_____ Date:_____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent (printed name):_____

Signature:_____ Date: _____

Appendix B

Survey questions

Perceived skills (1–3)

1 = Low to 3 = High

My ability to assess weight status and associated risk factors

My ability to address weight management and obesity issues with patients

My ability to teach and motivate patients toward physical activity

My ability to teach and motivate patients toward healthy eating practices

My ability to use behavior modification techniques to make lifestyle changes in your patients

My ability to deal with family issues around weight management

Professional Attitudes (1–5)

1 = Strongly disagree 5 = Strongly agree

I do not feel that obesity intervention is part of my scope of practice

I believe that a clinician's role is simply to raise the issue of obesity rather than intervene

I do not have time to deal with the issue of obesity in my practice

Obesity is too difficult an issue to tackle therefore I do not address it in my practice

I feel overwhelmed by the issue of obesity

I am not confident that any obesity intervention I attempt will make a difference

I do not feel sufficiently educated or competent in obesity intervention strategies

I do not know whom to refer patients in cases of obesity intervention

I am not comfortable in discussing obesity with my patients

I avoid bringing up the topic of obesity as I do not want to offend or jeopardize my relationship with my patients and/or their family members

As a healthcare provider, I am extremely frustrated with the low success rate in managing obesity

I feel that my patients will not be compliant and any obesity intervention efforts I attempt will have little impact if any

I do not feel the need to address obesity issues with my patients unless they look or act sick

I fear that talking about obesity could do even more damage by leading my patient toward an eating disorder or other psychological problem

Challenges (1–5)

1 = Strongly disagree 5 = Strongly agree

Obesity intervention is not taught in my discipline's curriculum before we enter practice

There is limited professional training in this area (e.g. continuing professional development)

Healthcare providers in my discipline are not adequately compensated for treating obesity

There is a lack of appropriate referral options (e.g. dietitians or other related professionals)

There is a lack of patient education materials regarding obesity to distribute to our patients

Healthcare providers in my discipline need more guidance toward raising a sensitive issue such as obesity with our patients.

Healthcare providers in my discipline need more guidance in motivational interviewing for behavior change related to obesity.

Note: Reprinted from Sanchez-Ramirez, D. C., Long, H., Mowat, S., & Hein, C. (2018). Obesity education for front-line healthcare providers. *BMC medical education*, *18*(1), 278. doi:10.1186/s12909-018-1380-2

Appendix C

Guidelines for obesity management	U.S. Preventive Services Task Force AHA/ACC/TOS 2013 guidelines AACE/ACE 2016 guidelines Summary of guidelines
Healthy lifestyle recommendations	Dietary Guidelines for Americans Physical Activity Guidelines for Americans Rethinking Drinking (NIH recommendations) *Your Guide to Healthy Sleep* (U.S. Department of Health and Human Services recommendations)
Comprehensive intensive lifestyle intervention	Components of comprehensive lifestyle intervention Effectiveness—evidence-based data Diet—EBM recommendations Physical activity—EBM recommendations Sleep—EBM recommendations Behavior change—EBM recommendations
Myths debunked	Diet myths debunked Physical activity myths debunked Behavior myths debunked
Pharmacological therapy	Indications Effectiveness Tips for prescribers Mechanism of action, dosage, side effects, safety, monitoring

Bariatric surgery	Guidelines from AACE, TOS, ASMBS 2013, and ADA 2017 Effectiveness and risks Role of primary care physician
How to manage obesity in a 15-minute outpatient visit	Guidelines 5A approach Motivational interviewing for lifestyle changes SMARTER goal setting for lifestyle changes Online tools for lifestyle changes
Abbreviations: AACE, American Association of Clinical Endocrinologists; ACC, American College of Cardiology; ACE, American College of Endocrinology; ADA, American Diabetes Association; AHA, American Heart Association; ASMBS, American Society for Metabolic and Bariatric Surgery; EBM, evidence-based medicine; NIH, National Institutes of Health; TOS, The Obesity Society.	

Note: Reprinted from Pasarica, M., & Topping, D. (2017). An Evidence-Based Approach to Teaching Obesity Management to Medical Students. *MedEdPORTAL: the journal of teaching and learning resources, 13*, 10662. doi:10.15766/mep_2374-8265.10662.

Appendix D:

Expenses	Costs	Total Costs
Recruitment Flyers	25 @.20	$5.00
Light Refreshments	$20 x 12sessions	$240.00
Educational Materials	$150	$150.00
Dissemination Posters	$75.00	$75.00
Total Budget		$470

Table 1: Descriptive Findings

Total # of Participants- Pre activity	Total # of participants- Post Activity	Male (%)	Female (%)	Rankings	Age (24-30)
20	20	9 (45%)	11 (55%)	100 % interns	100%

Self Described Weight	Pre Activity	Post Activity	*p*
Overweight	0	0	**0.014**
Normal	16	10	
Over Weight	4	10	

Table 2: Changes in ability to assess weight status and associated risk factors, professional attitudes and perceived challenges

Ability to assess weight status and associated risk factors, Professional Attitude, and Challenges		**Pre-Post Event n=20**		**Wilcoxon Matched Pair Test**		**Effect size**
Ability to assess weight status and associated risk factors (1-3)		**Descriptive**				**r=Z/√N**
1= Low - 3= High		**Pre-Mean (SD)**	**Post-Mean (SD)**	***Z***	***p***	**r=Z/√N**
My Ability to assess weight status and associated risk factors?		1.90 (0.686)	2.95 (.224)	**-3.466**	**0.001**	-0.548
My Ability to address weight management and obesity issues with patients		2.05 (0.510)	2.80 (0.410)	**-3.260**	**0.001**	-0.5155
My ability to teach and and motivate patients towards physical activity		2.45 (0.605)	2.75 (0.444)	**-2.121**	**0.034**	-0.3354
My ability to teach and motivate patients towards healthy eating		2.55 (0.605)	2.75 (0.444)	**-1.414**	0.157	-0.2236
My ability to behavior modification technique to make lifestyle changes in your patients		2.00 (0.459)	2.85 (0.366)	**-3.900**	**<0.001**	-0.617
My ability to deal with family around weight management		2.15 (0.587)	2.45 (0.510)	**-2.449**	**0.014**	-0.387
Professional Attitudes (1-5) **1= Strongly Disagree - 5=Strongly Agree**						
I Do not feel that obesity is part of my scope of practice		2.45 (1.234)	1.35 (0.489)	**-3.022**	**0.003**	-0.478
I believe that a clinician's role is simple to raise the issue of obesity rather than intervene		2.00 (1.026)	1.25 (0.444)	**-2.879**	**0.004**	-0.455
I do not have the time to deal with the issue of obesity in my practice		2.45 (1.099)	1.35 (0.489)	**-3.256**	**0.001**	-0.515
Obesity is too difficulty an issue to tackle therefore i do not address it in my practice		2.20 (1.056)	1.50 (0.513)	**-2.697**	**0.007**	-0.426
I feel Overwhelmed by the issue of obesity		2.30 (1.129)	1.55 (0.510)	**-2.830**	**0.005**	-0.447
I am not confident that any obesity intervention I attempt will make a difference		2.25 (1.164)	1.50 (0.513)	**-2.830**	**0.005**	-0.447

I do not feel sufficiently educated or competent in obesity intervention strategies	3.00 (1.124)	1.75 (0.444)	**-3.425**	**0.001**	-0.542
I do not know whom to refer patients in cases of obesity intervention	2.75 (1.118)	1.70 (0.470)	**-3.286**	**0.001**	-0.520
I am not comfortable in discussing obesity with my patients	2.60 (1.142)	1.75 (0.716)	-3.107	0.003	-0.491
I Avoided bringing up the topic as I do not want to offend or jeopardize my relationship with my patients and/or family members	2.25 (0.851)	1.60 (0.503)	-2.919	0.004	-0.462
As a healthcare provider I am extremely frustrated with the low success rate in managing obesity	2.80 (1.005)	1.80 (0.696)	**-3.216**	**0.001**	-0.508
I feel that my patients will not be compliant and any obesity intervention efforts I attempt will have little impact if any	2.60 (0.940)	1.74 (0.562)	**-3.176**	**0.001**	-0.502
I do not feel the need to address obesity issues with my patients unless they look or act sick	2.15 (0.813)	1.47 (0.513)	**-3.317**	**0.001**	-0.524
I fear that talking about obesity could do even more damage by leading my patient toward an eating disorder or other psychological problem	2.15 (0.813)	1.47 (0.513)	**-3.357**	**0.001**	-0.531

Challenges (1-5) **1= Strongly Disagree - 5=Strongly Agree**					
Obesity Training is not taught in my discipline's curriculam before we enter practice	3.30 (1.081)	3.30 (1.081)	0.000	1.000	0.000
There is limited professional Training in this area (eg. Educational Program)	3.55 (0.759)	1.90 (0.553)	**-3.954**	**<0.001**	-0.6252
Healthcare Providers in my discipline arenot adequately compensated for treating obesity	2.90 (0.852)	1.90 (0.641)	**-3.542**	**<0.001**	-0.56
There is a lack of appropriate Referrals	3.20 (0.894)	1.90 (0.553)	**3.601**	**<0.001**	0.56937
There is a lack of education Materials regarding obesity to distribute to our patients	3.00 (0.795)	1.90 (0.447)	**-3.508**	**<0.001**	-0.5547
Healthcare Providers in my discipline need more guidance toward raising a sensitive issue such as obesity with our patients	3.25 (.910)	1.85 (0.489)	**-3.695**	**<0.001**	-0.5842

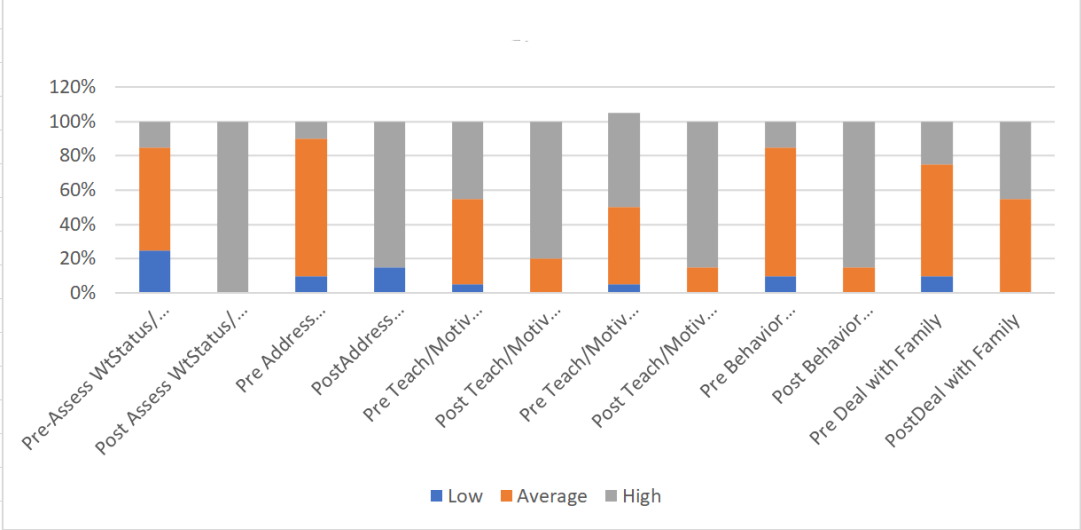
Healthcare Providers in my discipline need more guidance in motivational interviewing for behavior change related to obesity	3.65 (1.040)	2.00 (1.026)	**-3.568**	**<0.001**	-0.5642

Wilcoxon matched pairs test (z) Asymp Sig (2-tailed) p-value. *SD* Standard Deviation. Significant values boldfaced ($p < 0.05$).

Table 3: Comparison of pre and post responses a frequency was calculated

Ability to assess weight status and associated risk factors

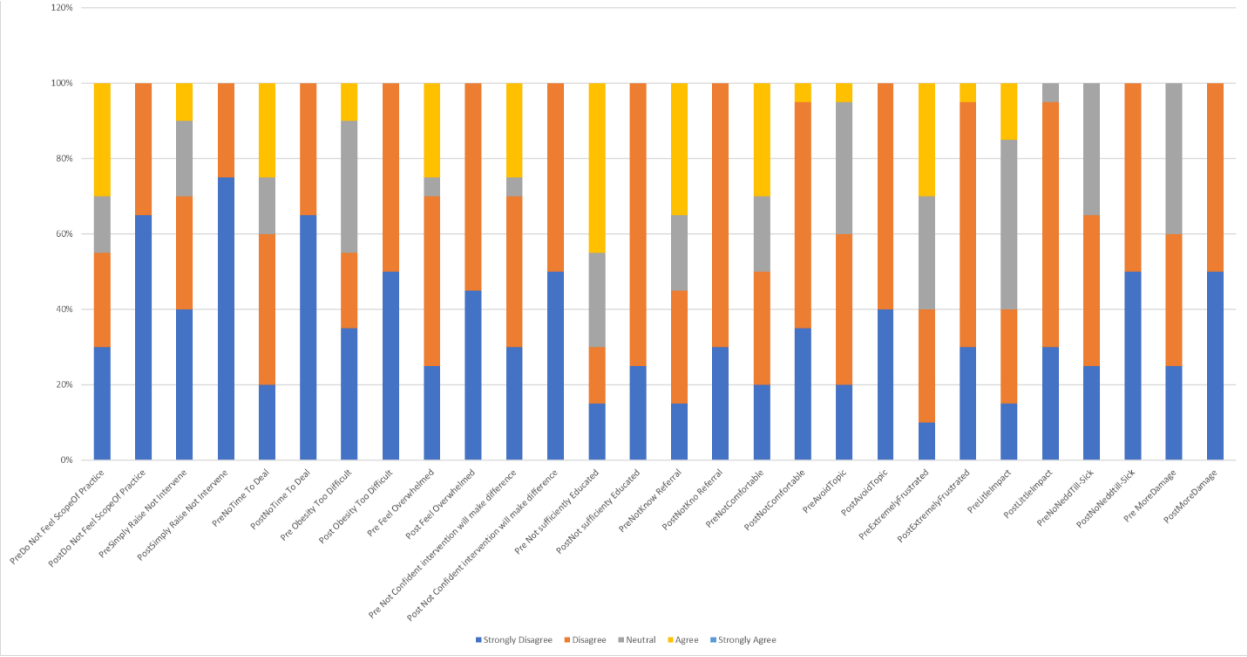
	Pre-Assess WtStatus/ RiskFactor	Post Assess WtStatus/ RiskFactor	Pre Address WtManagement/ Obesity	PostAddress WtManagement/ Obesity	Pre Teach/ Motiv Physical Activity	Post Teach/ Motiv Physical Activity	Pre Teach/Motiv Healthy Eating	Post Teach/Motiv Healthy Eating	Pre Behavior Modification Lifestyle	Post Behavior Modification Lifestyle	Pre Deal with Family	PostDeal with Family
Low	25%	0%	10%	15%	5%	0%	5%	0%	10%	0%	10%	0%
Average	60%	0%	80%	0%	50%	20%	45%	15%	75%	15%	65%	55%
High	15%	100%	10%	85%	45%	80%	55%	85%	15%	85%	25%	45%



Professional Attitude:

	Pre Not Feel ScopeOf Pract.	Post Not Feel ScopeOf Pract.	Pre Raise Not Interven e	Post Raise Not Interven e	Pre NoTim e To Deal	Post NoTime To Deal	Pre Obesity Too Diff.	Post Obesity Too Diffi.	Pre Feel Overwh elm	Post Feel Overw helm	Pre Not Confid interven. make diff.	Post Not Confid interven. make diff.	Pre Not sufficient Educ.	Post Not sufficient Educ.
Strongly Disagree	30%	65%	40%	75%	20%	65%	35%	50%	25%	45%	30%	50%	15%	25%
Disagree	25%	35%	30%	25%	40%	35%	20%	50%	45%	55%	40%	50%	15%	75%
Neutral	15%	0%	20%	0%	15%	0%	35%	0%	5%	0%	5%	0%	25%	0%
Agree	30%	0%	10%	0%	25%	0%	10%	0%	25%	0%	25%	0%	45%	0%
Strongly Agree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

	PreNotK now Refer	PostNotK now Refer	PreNotC omfort	PostNot Comfort	Pre AvoidT opic	Post AvoidT opic	Pre Extrem e Frustrat e	Post Extrem e Frustrat e	Pre Litle Impact	Post Little Impact	Pre NotTill-Sick	Post NotTill-Sick	Pre More Damage	Post More Damage
Strongly Disagree	15%	30%	20%	35%	20%	40%	10%	30%	15%	30%	25%	50%	25%	50%
Disagree	30%	70%	30%	60%	40%	60%	30%	65%	25%	65%	40%	50%	35%	50%
Neutral	20%	0%	20%	0%	35%	0%	30%	0%	45%	5%	35%	0%	40%	0%
Agree	35%	0%	30%	5%	5%	0%	30%	5%	15%	0%	0%	0%	0%	0%
Strongly Agree	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%



Challenges:

	PreObesity Train not taught before practice	PostObesity Train not taught before practice	Pre Limited Prof Train	Post Limited Prof Train	Pre Not Adeq Comp	PostNot Adeq Comp	PreLack of Refer	PostLack of Refer	PreLack of EducatMaterial	PostLack of EducatMaterials	PreNeed More Guidance to Raise Topic	PostNeed More Guidance to Raise Topic	PreNeed More Guidance for Motiv Train	PostNeed More Guidance for Motiv Train
Strongly Disagree	10%	10%	0%	20%	5%	25%	0%	20%	0%	15%	0%	20%	0%	30%
Disagree	15%	15%	15%	70%	25%	60%	25%	70%	30%	80%	25%	75%	20%	55%
Neutral	10%	10%	15%	10%	45%	15%	35%	10%	40%	5%	30%	5%	15%	5%
Agree	65%	65%	70%	0%	25%	0%	35%	0%	30%	0%	40%	0%	45%	5%
Strongly Agree	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	5%	0%	20%	5%