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Does self-evaluation and education in students change attitudes and beliefs towards Weight Stigma?

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by

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Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Science.

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ABBREVIATIONS

AHP	Aspects of Health Promotion
BMI	Body Mass Index
CDC	Center of Disease Control
HbA1c	Hemoglobin A1c
HDL	High Density Lipoprotein
Hs-CRP	high-sensitivity C-reactive protein
LDL	Low Density Lipoprotein
NIH	National Institute of Health
NEW	Nutrition, Exercise and Weight Management
TRIG	Triglycerides
TotChol	Total Cholesterol
PGC	Peer Group Classification
DPT	Doctor of Physical Therapy

ABSTRACT OF THE DISSERTATION

Does self-evaluation and education in students change attitudes and beliefs towards Weight Stigma?

by

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Doctor of Science, Graduate Program in Physical Therapy
Loma Linda University, June 2019
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The current state of global ensures physical therapists will encounter patients that are overweight/obese in all clinical settings, which makes them exceptionally positioned to promote lifestyle modifications to their patients. Unfortunately, weight stigma is highly prevalent among health care providers. Weight stigma has been shown to have adverse effects on patients.

The purpose of this study is to measure weight bias in the doctor of physical therapy (DPT) students. Elicit change in obesity stigma in DPT students by way of self-evaluation while enrolled in a course Aspects of Health Promotion (AHP).

Methods: Sixty students enrolled in AHP course participated in a blood draw, self-evaluation assignments, and a lifestyle change assignment involving a lifestyle journaling. The Nutritional, Exercise and Weight Management (NEW) Attitudes Scale taken at three distinct times. Baseline at the beginning of fall quarter, baseline to 6 months after the AHP course, and at 12 months the following year when returning from their clinical affiliation.

Correlation between NEW Attitudes Scale score and lipid profile revealed students with triglyceride levels > 150 mg/dL showed no significant improvement in their attitudes on weight stigma. In contrast, students with triglyceride levels < 150 mg/dL,

showed a significant change of improved score in their attitudes and beliefs on weight stigma P = .000. Measuring HbA1c, hs-CRP, and HDL levels in students, all showed a significant change of improved score at six months. Barriers to lifestyle change identified by the DPT students ranked highest barriers to least barriers as time management (60%), motivation (28%), illness/pain (10%) and media (3%) respectively. Total cohort attitudes and beliefs showed a significant change in improved scores from baseline to 12 months, which included the AHP course and their clinical affiliation.

In conclusion, healthier lipid panel, as well as hs-CRP and HbA1c correlated in improved attitudes and beliefs, barriers to lifestyle changes correlated with patients with type 2 diabetes, cancer, and senior citizens. Recommendations are to encourage a healthy lifestyle while students are in graduate work preparing to enter the health care field to lower negative bias towards the overweight and obese population.

Key Words: Weight stigma, Weight bias, Heath Care Provider, Lifestyle

CHAPTER ONE

INTRODUCTION AND REVIEW OF THE LITERATURE

Global Obesity

The US Surgeon General's call to action in 2001 detailed approximately 300,000 deaths annually associated with the growing epidemic of obesity[1]. Death rates related to overweight and obese body types may soon surpass smoking as the leading cause of preventable death in the United States [1]. Because obesity presents as a global problem, it is being identified as a pandemic [2]. The obesity pandemic needs to be addressed, especially in children, owing to its significant comorbidities, mortality, and costs--projected to exceed $150 billion in the United States.[3]. Obesity has exhibited a steady increase over the decades [4]. Unfortunately, obesity growth is paralleled by a debilitating weight stigma, which has spread commensurately [5].

Obesity Demographics

Obesity rates in adults have neared 70% in the U.S. population[6], which poses a significant public health concern and a substantial financial burden on society, with global impact estimated at $2 trillion in 2014 [7]. The epidemic of overweight and obesity levels are well-documented in the literature [3,8]. The National Institute of Health (NIH) reported the prevalence of overweight and obesity for adult males as almost three in four (73.7%), and two in three (66.9%) for females within the national populace[6]. Data from the Center of Disease Control and Prevention reveals children aged 2 – 5 years are at 13.9% rate of obesity, 6 – 11 years are at 18.4%, followed by 12 – 19 years are at 20.6 %[9]. The future of children that are overweight (BMI>/= 95th percentile), will increase to a

prevalence of 30% by the year 2030 and 86.3% of adults will be overweight or obese by the same year if the current trends remain [10].

Consequences of Obesity

Adverse health conditions associated with being either overweight or obese, include the following: Type 2 diabetes, gallbladder disease, coronary heart disease, hypertension, osteoarthritis, high blood cholesterol, hypertension, cancer [11], sleep apnea [12], gout [13], musculoskeletal disorders such as lumbosacral dysfunction and low back pain [14] and lower extremity disorders [15]. Chronic disease and obesity place significant stress on the health care system [16-19], and could negatively impact patient care [20] and patient health outcomes [21]. These comorbidities should not be considered only an adult problem; obesity and overweight children suffer from pediatric metabolic syndrome or insulin resistance, unhealthy lipid profiles [22], Type 2 diabetes [23], obstructive sleep apnea [24], and nonalcoholic fatty liver disease in children ages 6 – 18 years of age [25]. In a review by Cote et al., (2013), clinical evidence suggested cardiovascular damage once seen in adults is now occurring in obese children [26]. In a study of children 6 – 19 years of age, advanced vascular atherosclerosis was seen in 30 (75%) of obese children and 22 (73%) of familial dyslipidemic children. Examination of the carotid intima-media thickness was similar to an average 45-year-old-male [26].

Obesity Stigma

Weight stigma has been described as social rejection and devaluation of those who do not comply with prevailing societal norms of body weight and shape. Overweight persons may be stereotyped as lazy, unmotivated, lacking willpower, or undisciplined [5].

Stigma may further be perpetuated by social ideals which associate thinness with beauty and health [27].

Consequences of Stigma

Consequences of weight stigma are counterproductive to health, long-lasting, and profound. When attempting to motivate an individual to lose weight, stigmatizing is counterproductive and could result in weight gain[28]. Rather than moving individuals forward towards weight loss goals, weight discrimination may promote weight gain [29]. Self-perception of obesity is related to the quality of choices in selecting food. The higher the perception of stigma, the more calories consumed in a meal [30], creating harmful eating patterns [31,32], and maladaptive behaviors [33].

The population, most at risk for obesity stigma, are children [34]. Clinical depression, social isolation, suicide attempts [35], bullying [36], antisocial behavior, substance abuse, and medication non-adherence are strongly related to weight stigma in children [37]. Obesity is one of the leading causes of bullying, globally [38,39]. Also, depression associated with obesity is now recognized in youth [40].

When exercise and diet are made to be a cornerstone of weight loss, individuals who are weight-stigmatized become less capable of engaging in physical activity and are correspondingly less willing to exercise [28]. Furthermore, weight stigma can negatively influence motivation to exercise, particularly among individuals who have internalized societal attitudes about weight [41]. Finally, individuals who are obese or overweight and have internalized the stigma of obesity, frequently find discomfort in social interactions and may isolate themselves due to feelings of shame and inferiority thus decreasing their quality of life [37].

How society views personal responsibility for health conditions influences stigma. Weiner et al., (1995) noted that conditions that rated low on personal responsibility such as Alzheimer's disease rated high on likability and elicited pity and willingness to help from others. In contrast, the perceptions that rated the person high on personal responsibility, such as obesity, evoked dislike, little pity, and anger, thus rating low on helping tendencies. Obesity and drug addiction featured prominently as personally generated conditions [32].

The negative consiquences of weight stigma makes a key point clear, to manage and suppress the obesity epidemic, health care professionals must combat the parallel epidemic of weight and corresponding stigmatization [5].

Onset of Stigma

Stigmatization of overweight and obese individuals appears to start early in life, as seen in pre-school children [42]. Children as young as three years of age describe overweight children as "mean," "stupid," "lazy," and "ugly" [5]. Preschool children were given dolls with identical faces and hair color, except for different body types, described in the study as thin, average, and fat. Children were shown pictures and asked to describe them with options of negative and positive adjectives [43]. The fat doll ranked lowest, in "helping others," "has a best friend," "puts toys away," "happy," and "smart." The fat doll did rank higher for "sad," "no friends," "tired," "gets teased," and "gets sick." Worobey (2014) found that girls aged 3 ½ to 5 ½ years of age exhibited preferences that were fairly well-established [43]. Solbes et al., (2010), found that western societies influenced the idealization of thinness early on, developing explicit and implicit weight bias in children.

In a study of children aged 6 – 11 years, as children aged, explicit prejudice was reduced, but implicit bias regarding weight continued [44].

Latner and Stunkard (2003) replicated a study by Richardson et al., (1961), in which changes in perception of obesity stigma in school-aged children 10 – 11 years old. Investigators asked the children to rank pictures of children in order of how well they liked each child [45]. Six photos detailed various children: one child of average weight and no disabilities, one obese child, with the remaining four pictures portraying students with disabilities, such as a child with an amputated hand, one in a wheelchair, one holding crutches with a brace on the left foot, and one child with a disfigured face. The healthy child garnered the highest ranking, and the obese child received the lowest. Results were similar in that the highest and lowest ranked child matched that of the Richardson (1961) study. However, ratings between the highest and lowest ranked child were further polarized, showing current bias against obese children was stronger than in 1961 [45].

Weight stigma of children and adolescents is more predominant in overweight girls than overweight boys [46]. The negative consequences of weight stigma potentially work against weight prevention [36,47]. Studies examining the negative bias of obesity universally found that bias begins young, with ideas of obese children lacking friends, being lazy, lonely, and not honest [43,45,48,49]. With this generation of children likely to predecease parents [50], addressing overweight and obesity epidemic should serve as the focus of healthcare initiatives.

Stigma in Healthcare Providers

Currently, physicians treat an estimated 25% of the US population every month, and overweight patients represent approximately 60% of this patient population [51]. Of

physicians studied, 30% held negative attitudes toward overweight and obese patients; 57% were pessimistic about patients' abilities to lose weight, and 64% often set weight loss objectives more rigorous than guidelines required [52]. Obesity stigma can reduce the quality of patient care, despite the intentions of healthcare professionals to provide high-quality care [53]. Overweight individuals may be stereotyped as lazy, noncompliant, undisciplined, weak-willed, and uninterested in their health by health care providers [31]. Stereotyping of obese and overweight individuals occurs across the field [32,54]. Medical students described heavier patients as ugly and sloppy [55]. Dietetic students [56] and physical therapists [57] also engaged in stigmatization, which may further disadvantage obese patients [28]. Patients feeling stigmatized for their obesity have reported barriers to medical treatment, thus enhancing health disparities in the obese and overweight population [58]. The complexities of weight are oversimplified in prescriptive outpatient advice counseling. With the focus on diet and exercise perceived as the leading cause of illness and obesity, the onus of change is on the patient, with inadequate instruction and education. If a significant change fails to occur, health care providers frequently become frustrated with patients, attributing failure to lack of patient effort [31]. Weight stigma may hinder the quality of care [53].

Stigma in Education/Curriculum

Curricular change is needed due to the spectrum of healthcare providers working with patients who are overweight or obese. Obesity and overweight education should be implemented in curricula, adding assessment and treatment protocols [59]. O'Brien et al., (2010) found that anti-fat prejudice can either be reduced or exacerbated, depending on educational directives [60]. Curricular education for healthcare professionals should include

the complexity of obesity. Student reflection [57], self-evaluation, lifestyle [61], and interventions [62] to reduce the negative confluences of obesity stigma should be part of the curriculum.

In a study of dental students and hours spent in formal obesity education, 78.9% of respondents, reported receiving 0 – 1 hour of formal education on obesity. While more than half perceived obesity as a severe medical condition, only 22% were able to define obesity [63]. Budd et al., (2011) observed that healthcare professionals are primarily still negative in their attitudes toward obese patients, indicating that healthcare curricula should implement the awareness of obesity stigma.[64].

To enhance awareness of the complexities of obesity and improve sensitivity, educational research should perform pre and post-testing on education strategies to reduce stigma in healthcare [64]. In a study by Fogelman et al., (2002), 72% of medical students considered themselves not well prepared in medical school to treat overweight patients. More education in the curriculum focusing on obesity in medical school appeared to be necessary based upon the study findings[65].

Vartanian et al., (2013) examined the perceptions of undergraduate students on obese individuals in two parts. First, looking at a picture of a male and female of healthy weight, respondents were asked to describe attributes of eating behavior such as food choices followed by descriptors, there were negative and positive. The history of the male and female subjects was revealed, with one having lost weight via surgery and the other by diet and exercise. The perceptions of the individuals significantly changed to negative attributes, with the surgical weight loss responses primarily negative. Findings suggest that even healthy weight patients were stigmatized, upon learning of past weight

challenges. Physician perception changed to a negative perspective, with the individual being categorized as lazy, thus enforcing the stereotype of laziness, and refusing to allow an individual who has lost weight to escape obesity stigma [66].

It is critical to evaluate and understand the attitudes of individuals in order to measure a change in perception and guide curricula to reduce weight stigma to ensure optimal and equitable care [62]. To address the obesity epidemic, health care professionals must also address the paralleled epidemic of weight stigma [5]. The complex causes of obesity must occur in the general education of the health care provider [67]. Strategies used in medical schools and healthcare programs has mainly included lectures in complexities of obesity [63,65] or obesity and nutrition [68], case studies by way of standardized patients playing role of obesity focused on communication [59], and nutrition course to improve student counseling-related confidence, interactive workshop [69], all of which used questionnaires to measure change.

Stigma – Physical Therapist

Patients' were surveyed to identify their perception of physical therapists' role in health promotion, and a majority of patients (67.4%) agreed that physical therapists should advise them on strategies to maintain a healthy weight [70]. Sack et al., (2009) studied the relationship between knowledge and attitudes of physical therapists and found that just over 50% of respondents held negative beliefs towards persons who are obese and 40% viewed them as lazy[71]. Weight stigmatization may negatively impact patient care [61].

Stigmatization of overweight patients contributes to depression, anxiety, low self-esteem, body dissatisfaction, maladaptive eating behaviors, and lower levels of physical

activity [36]. Stigmatization could discourage patients from seeking needed healthcare [72]. Students seeking to become healthcare providers will inevitably manage the care of overweight or obese individuals due to current rates of overweight and obesity. Physical therapists spend a significant amount of time with patients and are uniquely positioned as healthcare providers to discuss and promote health and wellness with their patients.

Can formal education on the complexities of overweight/obesity be implemented in a standing course? A change in perceptions of the healthcare provider could create a better view of the overweight and obese population, therefore, making optimizing patient care.

Nutrition, Exercise and Weight Management (NEW) Attitudes Scale

Across the gamut of healthcare providers, weight stigma has been well studied [31, 32, 52, 54, 58]. Ip et al. (2013) measured changes in attitudes and knowledge of medical students' beliefs regarding obesity, a long and arduous process undertaken to create a valid and reliable questionnaire. This questionnaire is titled The Nutrition Exercise and Weight Management Attitudes Scale (NEW Attitudes Scale). The time frame for the development of the NEW Attitudes Scale was from August 2008 to March 2011. A team of experts created the NEW Attitudes Scale. Feedback was ascertained from medical students and once developed, medical education experts were engaged to judge and weight scaled items. The process continued with focus groups, development of themes, and, finally, the NEW Attitudes Scale using the Thurstone scale of 31 items, was subsequently tested for validity and reliability.

The NEW Attitudes Scale consists of 31 questions using "strongly agree" to "strongly disagree" numbered 1 – 5. With the weighted Thurstone factor, scores range

from -118 to +118. The higher number indicates a more positive attitude, and a lower number indicates a more negative attitude. The NEW Attitudes Scale is both valid and reliable [73].

Therefore, the purpose of this study was to measure a change in the perception's of obesity stigma by way of curricular education and student self-evaluation in the second-year doctor of physical therapy (DPT) students. Our hypothesis is self-evaluation in DPT students will improve attitudes and beliefs in the overweight and obese population.

CHAPTER TWO

THE EFFECTS OF SELF-EVALUATION BY WAY OF LIFESTYLE JOURNALING AND EDUCATION ON OBESITY STIGMA IN PHYSICAL THERAPY STUDENTS

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Abstract

Purpose: The global obesity epidemic and health risks associated with obesity increase the likelihood of the overweight/obese population seeking health care. Unfortunately, overweight/obese patients seeking health care face weight stigma across the spectrum of health care providers. Weight stigma has been identified in graduate students preparing to enter the health care field. Lifestyle changes have been strongly advocated for weight loss, as well as health and wellness. Therefore, the purpose of this study is to reduce weight stigma by implement self-evaluation on the Doctor of Physical Therapy (DPT) students by way of lifestyle journaling, self-screening questionnaires and a blood test and as well as identify barriers to lifestyle change in the doctor of physical therapy students.

Methods: Participants were 60 (DPT) students enrolled in Aspects for Health Promotion (AHP) course. During the AHP course, DPT students participated in a lifestyle change assignment, which required journaling their goals, barriers, and success. Self-assessment assignments completed in the AHP course included the Insomnia Severity Index, Perceived Stress Scale, Self-motivation Scale for Compliance, Physical Activity Stages of Change, and blood test. The Nutrition, Exercise and Weight Management (NEW) Attitudes Scale was used to measure changes in attitudes and beliefs of the DPT students. The DPT students completed the baseline NEW Attitudes Scale questionnaire in fall quarter, again after the AHP course in winter quarter, 6 months from baseline and the final questionnaire distributed upon returning from their clinical affiliation 12 months from baseline.

Results: Males were trending towards a significant change (14.6%) in attitudes and beliefs from baseline to 6 months P=.063. From baseline to 12 months, males improved (35.2%) in their attitudes and beliefs (P=.002). Females had no significant change (2.3%) from the baseline score to 6 months (P=.468). From baseline to 12 months, females improved (24.5%) in their attitudes and beliefs (P = .012). Total cohort showed trending towards a significant change in their attitudes and beliefs from baseline to 6 months (P=.065). From baseline to 12 months, there was an improvement of 27.6% in their attitudes and beliefs (P = .000). Peer Group Classification showed the highest to lowest ranked barriers to lifestyle change as, Time Management (60%), Motivation 28%, Illness/Pain 10%, and Media 3%. Self-selected goals ranked highest to lowest, Strength training, Aerobic training, Diet, hydration, spiritual development, social development, sleep, and reducing media.

Conclusion: While both males and females showed a significant change in attitudes and beliefs towards weight stigma upon returning from their clinical affiliations, males trended sooner to significant change than females. The combination of curriculum and clinical experience, suggest a considerable influence in a change in perception than course work alone. DPT students identified barriers to their lifestyle goals as time management 59%, Motivation 28%, Illness/Pain 10%, and Media 3%. These barriers correlated with patients with type 2 diabetes, cancer patients, and senior citizens. The graduate-level curriculum should include student self-evaluation such as lifestyle, self-screening, blood tests, and obesity education to guide pre-health care provides away from the adverse effects of weight stigma.

Key Words: Weight stigma, Weight bias, Heath Care Provider, Lifestyle

Introduction

The US Surgeon General's call to action in 2001 reported that approximately 300,000 deaths per year are associated with the growing epidemic of overweight and obesity [1]. Death rates related to overweight and obesity may soon surpass smoking as the leading cause of preventable death in the United States [1]. Obesity is being identified as a pandemic due to its global problem[2]. The obesity pandemic needs to be treated and more importantly prevented (especially in children) owing to its significant comorbidities, mortality, and costs projected to exceed $150 billion in the United States[3]. The growing pandemic of obesity has exhibited a steady increase over decades[4]. Unfortunately, debilitating weight stigma is following in trend with obesity growth[5].

Obesity rates in adults have neared 70% in the U.S. population[6], which poses a significant public health concern and a substantial financial burden on our society. This financial burden in 2014, had a global impact that was estimated at $2 trillion[7]. The epidemic of overweight and obesity levels is well documented in the literature[3,8]. The National Institute of Health (NIH) report the prevalence of overweight and obesity for adult males is almost three in four (73.7%) and two in three (66.9%) for females in the national populace[6]. Data from the Center of Disease Control and Prevention reveals children aged 2 – 5 years are at 13.9% rate of obesity, 6 – 11 years are at 18.4%, followed by 12 – 19 years are at 20.6%[9]. The future of overweight/obese children (BMI $\geq$= 95th percentile), is projected to increase to a prevalence of 30% by the year 2030 and 86.3% of adults will be overweight or obese by the same year if the current trends remain[10].

Adverse health conditions associated with being either overweight or obese, include the following: Type 2 diabetes, gallbladder disease, coronary heart disease,

hypertension, osteoarthritis, high blood cholesterol, hypertension, cancer[11], sleep apnea[12], gout[13], musculoskeletal disorders such as lumbosacral dysfunction and low back pain [14] and lower extremity disorder[15]. Chronic diseases and obesity place significant stress on the health care system[16-19], and could negatively impact health care providers to minimize patient care[20] and patient success[21].

Stigmatization of overweight and obese individuals appears to start early in life, as seen in pre-school children [22]. Children as young as three years of age describe overweight children as "mean," "stupid," "lazy," and "ugly"[5]. Latner and Stunkard replicated a study by Richardson et al., (1961)[74], to measure changes in perception of obesity stigma in school-aged children (10 – 11 years old)[45]. Investigators ask the children to rank pictures of children and rank them in order of how well they liked each child[23]. Six photos detailed various children: one child of average weight and no disabilities; one child obese; the remaining four pictures portrayed students with disabilities, such as a child with an amputated hand, one in a wheelchair, one holding crutches with a brace on the left foot, and finally, one child with a disfigured face. The healthy child garnered the highest ranking, and the obese child received the lowest. Fourty two years later, Latner & Stunkard results were similar in that the highest and lowest ranked child matched that of the 1961 study. However, in these four decades that followed, rating between the highest and the lowest ranked child was further polarized, showing bias against obese children was stronger than in 1961.

Currently, physicians treat an estimated 25% of the US population every month, and overweight patients represent approximately 60% of this patient population[24]. The complexities of weight are oversimplified in prescriptive outpatient advice counseling.

With the focus on diet and exercise perceived as the leading cause of illness and obesity, the onus of change is on the patient, with minimal instruction and education. If a significant change fails to occur, health care providers frequently become frustrated with patients, tending to view them as lazy, unmotivated, and lacking in willpower contributing to obesity[25].

Tomiyama et al. described weight stigmatization as social rejection and devaluation of those who do not comply with prevailing social norms regarding body weight and size[5]. Obesity stigma can reduce the quality of patient care despite the intentions of healthcare providers to provide high-quality care[26]. Overweight individuals may be stereotyped as lazy, noncompliant, undisciplined, weak-willed, and uninterested in their health by health care providers[25]. Stereotyping of obese and overweight individuals is done across the field of healthcare providers such as physicians, psychologist, nursing health professionals[27,28,] and dental hygiene students[29]. Medical students described heavier patients as ugly and sloppy[30]. Dietetic students[31] and physical therapists [32] are as susceptible to weight stigma, which may further disadvantage obese patients to increase their risk for obesity[33]. Patients feeling stigmatized for their obesity have reported barriers to medical treatment, thus enhancing health disparities in the obese and overweight population[34].

When exercise is made to be a cornerstone of weight loss, for individuals who have internalized societal attitudes, that weight stigma can negatively influence motivation to exercise[35]. When exercise and diet are made to be a cornerstone of weight loss, individuals who endure weight-stigmatizing become less capable of engaging in physical activities and are thus less willing to exercise and tend to avoid it[33]. With this

generation of children who will die before their parents due to obesity[36], solving the overweight and obesity epidemic does not appear imminent. Health care providers, weight-based stigma must change to serve patients better.

According to Bocquier et al., 30% of physicians studied held negative attitudes toward overweight and obese patients; 57% were pessimistic about patients' abilities to lose weight, and 64% often set weight loss objectives more demanding than guidelines require[34]. Education regarding complex causes of obesity must be in curricular education of health care providers[38]. Currently, physical therapist perceptions of obese and overweight patients are neutral[39]. Can formal curricular education on the complexities of overweight/obesity be implemented in a standing course? A change in perceptions of the healthcare provider could create a better view of the overweight and obese population, therefore, making patient care more optimal.

Students progressing to become healthcare providers will inevitably manage the care of overweight or obese individuals due to current rates of overweight and obesity[6]. Physical therapists spend a significant amount of time with patients and are uniquely positioned as healthcare providers to discuss and promote health and wellness with their patient's[40,41]. How patients identify themselves, by way of stigma imposed on them, the physiological consequences can be far-reaching.

In examining patients' perception of physical therapists' role in health promotion, a majority of the patients agreed that physical therapists should advise them on strategies to maintain a healthy weight[42]. Sack et al., studied the relationship between knowledge and attitudes of physical therapists and found that just over 50% of respondents held negative beliefs towards persons who are obese and 40% viewed them as lazy[39]. Carrying

weight stigma may negatively impact patient care[43]. Stigmatization of overweight patients contributes to depression, anxiety, low self-esteem, body dissatisfaction, maladaptive eating behaviors, and lower physical activity[44]. Such conduct could discourage patients from seeking needed healthcare[45].

Frank et al., found a correlation between the physicians' consumption of less fat, screening themselves for cholesterol and who were trying to change their eating habits, were more likely to counsel their patients on cholesterol and cholesterol screening[46].

Curricular changes in education are needed to reduce stigmatizing of overweight and obese patients, thus improving the quality of patient care[47,48]. O'Brien et al. found that anti-fat prejudice can either be reduced or exacerbated depending on educational directives[49]. To address the obesity epidemic, health care professionals must also address the paralleled epidemic of weight stigma[5,25]. Curricular education for healthcare professionals has been recommended across the spectrum of healthcare providers[30,47,50,51] and should include education in obesity and its complexities. Student reflection[32], self-evaluation, lifestyle[43,] and interventions[52] to reduce the negative confluences of obesity stigma should be part of the curriculum. Negative attitudes towards the overweight and obese population have adverse effects on their quality of life[25,53] and reduced quality of care[5,26]. With the current rates of obesity in our nation[6], it is inevitable that healthcare professionals will treat this patient population. Therefore, the purpose of this study was to measure a change in the perception’s of obesity stigma by way of curricular education and student self-evaluation in the second-year doctor of physical therapy (DPT) students.

Methods

Participants were recruited from a cohort of 60 second-year DPT students, 29 males and 31 females, enrolled in a required Aspects of Health Promotion (AHP) curricular course at Loma Linda University (LLU). Participants were required to complete all assignments and pass the AHP course with a satisfactory grade in adherence to LLU standards.

Subjects participated in self-assessment tools such as a Nutrition, Exercise and Weight Management (NEW) Attitudes Scale [54], blood test, weekly lifestyle journaling, and in-class assignments. All tools utilized were part of standard course materials, except for the NEW Attitudes Scale. To minimize instructor and participant bias, a double-blind study design was implemented. The researcher was blinded to lifestyle journaling, blood tests, and questionnaire results. The study was reviewed by the Loma Linda University Institutional Review Board.

Sack et al., studied physical therapist relationship between attitudes and knowledge regarding obesity[39], employing the use of a survey used to study attitudes of physicians by Foster and colleagues[55]. The survey used was modified to tailor the scope of practice of physical therapists. In a study by Ip et al., a survey instrument was created NEW Attitude Scale and was used to measure medical students' beliefs and attitudes toward obese patients[54]. Ip and colleagues determined their scale to be both valid and reliable to use for future studies[54]. The current study employed the use of the NEW Attitudes scale without modification. The NEW Attitudes scale does not suggest prescribing medication as did the questionnaire by Foster and colleagues[55], thus making it desirable to use with physical therapist having direct access[56].

The survey instrument used for this study was the NEW Attitudes Scale, which was developed to measure obesity bias such as anti-fat, self-efficacy belief about how others understand obesity[54]. Scores ranged from -118 to +118 with a higher score indicating a more positive attitude. The NEW Attitudes Scale is comprised of 31 statements using a 1 - 5 range with 1 = strongly agree to 5 = strongly disagree. The NEW Attitudes Scale was administered with distractor statements embedded to improve validity. The NEW Attitudes Scale was taken at three distinct times (Figure 1). Baseline at the beginning of Fall Quarter, at six months, and finally the following year at 12 months when returned from their clinical affiliation.

As part of the AHP course, students' lipid profiles were assessed via fasting blood tests, administered at the beginning of the AHP course and after the quarter. Samples were coded to protect privacy. The blood test was during the first week of the quarter to avoid the stress of exams or quizzes. Maduka et al. studied undergraduate students under examination stress and lipid profile and cortisol levels and found a significant negative relationship between stress and lipid profile and cortisol levels before examinations[57].

Health and wellness have been described in the literature as more than diet and exercise, inclusive of spiritual, emotional, and intellectual wellness elements[58]. Based on a Huhns more global approach to creating a better sense of wellbeing and quality of life, students were instructed to make weekly journal entries, detailing specific wellness goals[58]. The purpose of the lifestyle journal (LSJ) assignment was to simulate a patient and healthcare provider working together to create a lifestyle change. LSJ assignments included goal writing, identifying barriers to success, and goal modification.

At the beginning of the AHP course, goals were chosen independently by the students. Each week, goals were identified as *met* or *unmet*. Barriers were documented if goals were not unmet, and goals were modified as needed by the student. For example, "It was raining all week, so I could not go out running." At the end of the week, students could modify or retain goals for the following week as they felt best. Numerous studies recommend focusing on changing lifestyle to improve health and lose weight[41,43,59] as well as reduce obesity stigma in curricula [60].

Procedures

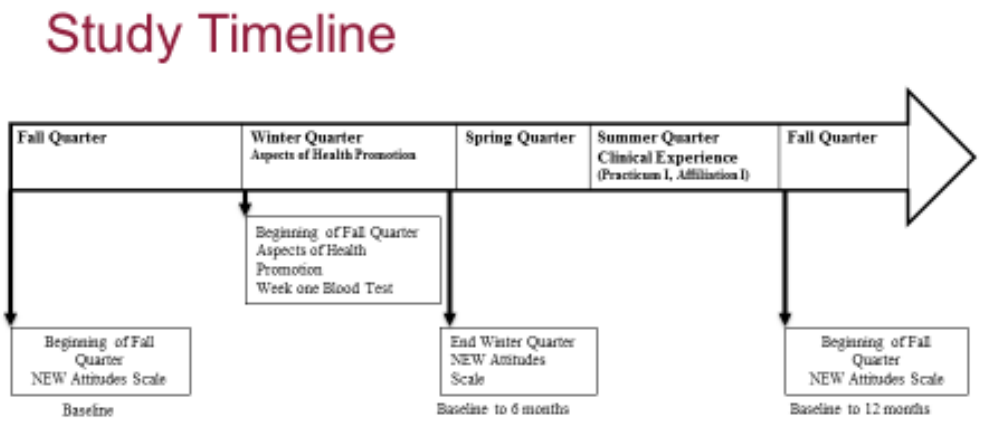

Figure 1. Timeline showing curricula when the NEW Attitudes Scale survey was administered and AHP course contents.

To disguise the study purpose, and to utilize a specified timeline, the first NEW Attitudes Scale was administered, in Fall quarter before the AHP course. In the Winter quarter, students enrolled in the AHP course. On the first day, students selected goals commensurate with health and wellness lifestyle changes, which were subsequently entered into their journals. Students could select as many goals as needed. At the end of the week, next to each goal, a number one would indicate goal reached while zero would

indicate a failure to reach the specified goal. Next, barrier and triggers were documented, followed by goal modifications; journal entry proceeded for the length of the quarter. The instructor was blinded to journal entries to prevent students from detailing successes for grade improvement. Students were informed that grades depended solely on journal participation, not content.

During the first week of the quarter, DPT students had their fasting blood draw in the morning. Each student was given a code, to blind the researcher and the phlebotomist to the subjects. On the second week, students received their results.

During the AHP course, extraneous assignments included a variety of self-evaluation surveys: Insomnia Severity Index, Perceived Stress Scale, Self-motivation Scale for Compliance, Physical Activity Stages of Change, and an online physiological age assessment. Following each assignment, students were asked to reflect on their results. Students kept a self-assessment file.

Course modules included physiology of obesity, environmental factors, social and socioeconomic factors, stress-related factors, nutrition/diet, genetic and microbial influences in obesity, obesity stigma, marketing strategies used to confuse consumers, research analysis, and exercise.

The collected data was entered into Excel 2016 (Microsoft Corporation, Redmond, WA, USA) and data were analyzed using SPSS 25 (SPSS Inc., Chicago, IL, USA) and SAS 9.4 (SAS Institute, Cary, NC, USA). The statistical analyses included descriptive statistics, two sample t-tests, pair t-test, and Non-parametric statistical testing: $\chi 2$ tests for contingency table and Wilcoxon signed – rank test. The internal consistency was checked via Cronbach's as a measure of reliability statistics. The Cronbach's

reliability coefficient normally ranges between 0 and 1, and 0.7 is considered an acceptable reliability coefficient. Mean ±SD was computed for quantitative variables and frequency (percentage) for categorical variables. All analyses were performed at an alpha level of .05.

Qualitative Data Analysis

For the lifestyle journal, there were six domains in which students selected as goals for their lifestyle change. The six domains were: 1) strength training, 2) cardiovascular training, 3) diet, 4) spiritual development, 5) social development, and 6) sleep quality. For all six domains, there was an upward trend of percent of success in students reaching their goals through 8 weeks.

A Peer Group Classification consisted of 4 licensed physical therapist reading all the journals, and categorizing the barriers to students reaching their lifestyle goals. The barriers consisted of 1) Time Management, 2) Motivation, 3) Illness/Pain and Media. Sub categories are seen in Table 6.

Results

This study included 60 subjects enrolled in a Doctor of Physical Therapy program. For race and age, there was no significant difference between males and females. For weight, height, and BMI, there was a significant difference between males and females. Table 1 summarized the characteristics of the participants at baseline.

For the mean score (SD) of the New Attitudes Scale by gender over time, there was no significant difference in score from baseline to 6 months for males, females, and total participants, P = 0.063, P = 0.468, 0.065 respectively. From baseline to 12 months

there was a significant change of improved score for males, females and total participants, P = 0.002, P = 0.012, P = 0.000 respectively Table 2.

The responses to significant questions from the New Attitudes Scale from baseline over time are seen in Table 3. From baseline to 6 months, statements 4,7,10, 16, 17, 21, 23, 26 were found to be significant for nutrition and counseling patients on nutrition, exercise, weight loss. From baseline to 12 months, statements 2, 12, 16, 18, 19, 21, 24, and 29 were found to be significant for exercise counseling, positive beliefs on overweight/obese patients following advice and counseling, a personal desire to counsel patients on weight management. Statements 16 and 21 were found to be significant with improved scores at six months and 12 months, which covered the attitudes of treating overweight/obese patients. Descriptions of which statements were found to be significant are seen in Table 4. Table 5 illustrates which statements from the NEW Attitudes Scale, which was found to not be significant at either baseline to 6 months or baseline to 12 months.

For all six domains of the lifestyle journal, there was an upward trend of percent of success in students reaching their goals through 8 weeks. Figures 2A – 2F indicate for each goal, the percent of success on a weekly basis in the blue bars, while the yellow bars represent the percent (%) of failure on a weekly basis. The blue dotted line represents the trend of success over eight weeks.

The barriers in order of rank were: time management, motivation, illness/pain, and media, with the highest to lowest ranked at 58%, 28%, 10%, and 3% respectively. The subcategories for each are seen in Table 6.

Discussion

For the total score, there was no significant change in score for males, females, and total participants from baseline to 6 months, however, there was a significant change of increased score from baseline to 12 months. The NEW Attitudes Scale has clinically based statements, which may have influenced the total score at six months, due to students not having the same clinical interaction with patients as they did after returning from their clinical affiliations. These scores could suggest the influence of clinical experience on their attitudes and beliefs. Ip and colleagues 2013 using the NEW Attitudes Scale survey showed a 27% increase in total score following the intervention and reported the influence of working with patients and providers might have affected their attitudes and beliefs[73]. The current study had a 27.7% increase in total score from baseline to 12 months when students returned from their clinical affiliation suggesting an influence of working with patients.

The lack of significant change in the scores at six months suggests the difficulty in changing the perspective of attitudes and beliefs of students, even if they are preparing to health care providers. With the combination of education and clinical experience, there was a significant change in improved score from baseline to 12 months. Of the 31 statements in the NEW Attitudes Scale, 14 statements had a significant change at either six- months or 12-month assessments. O'Brien and colleagues sought to reduce anti-fat prejudice in preservice health students and reported that anti-fat prejudice could be reduced or exacerbated by education[60]. Changing attitudes initially could also be attributed to negative attitudes and beliefs be socially acceptable[75]. Contributing to weight stigma being socially acceptable, health care providers purpose is to assist patient management of disease and dysfunction and move them to better health. When

overweight and obese patients are perceived as them not wanting to improve their health, then it is felt that they get what they deserve. This attribution perspective described by van Leeuwen and colleagues could have influenced physical therapy students attitudes and beliefs[76].

The total score comparing males to females at six months, there was trending towards a significant change in score for males and not females. These original scores in females could reflect the attitudes and beliefs of the females due to women being stigmatized in society greater than men[77]. The social demands on females to be beautiful and thin[78] added to internalizing weight stigma which has been shown to influence women to not only accept negatively biased towards them but in turn creates a negative bias towards others with obesity[79]. Finally, Harriger and colleagues in 2010 found preschool girls as young as 3 – 5-year-olds have emotionally invested the ideal thin body size. All these components combined could be reflective in the six months' score.

The trend of success for diet improved throughout the eight-week course. This may have influenced the significant improvement in the score at six months seen in statements number 4 and 5, finding it rewarding to talk about nutrition with someone and a desire to counsel patients on nutrition. At 12 months, that significance was lost. This could have been that the students found it challenging to discuss this topic with their patients or lacked the confidence to talk about nutrition with their patients. Crowley and colleagues studied medical students and found their diet to improve during the diet and exercise course, as well as their scores improved in confidence[68]. However, in contrast to this study, Conroy and colleagues did a pre and posttest only. Crowley and colleagues found that students changed their habits during the nutritional course and had improved

scores of confidence in their study; less than 15% of the entire group felt comfortable in discussing nutrition with others[78]. Their finding closely matches the current study showing improve scores at six months but less confidence in given the opportunity when working with patients.

Lifestyle assignments revealed the number one barrier to lifestyle change was time management. The subheading for time management seen in (Table 6), show lack of time, students not being in the same routine, forgetfulness due to being busy, and having unrealistic goals, all being part of time management. An example of unrealistic goals would be students having goals too high and not being able to reach them every week. No modifications were made when students wrote that there was no time to reach their goals. During week four, the students collectively showed a decrease in the percent of success in reaching their goals that week and an increase in failure. This was seen in strength training, cardiovascular training, spiritual development, and sleep quality; however, not in social development or diet. Smetaniuk and colleagues research on physical therapy students support our findings, in that their study revealed students gave up sleep and physical activity over academic success[80]. Barriers of being too busy and lack of time were also supported in by Arzu and colleagues finding in their study of physical therapy students, being too busy was the most cited barrier to students exercising[81], while Gomez-Lopez and colleagues found in university students cited that lack of time was a barrier for success in reaching their active lifestyle[82].

The strengths of this study were the blinding of the lifestyle journal and NEW Attitudes Scale score, to minimize the effect of wanting to write the success of their goals for a grade. Also, the length of the study was 12 months from baseline to the final

assessment, which included both education and clinical experience. While the study intended to examine second-year doctor of physical therapy students, this limited the sample size and was a specific cohort. Recommendations for future studies should include lifestyle journaling while participating in AHP course and at another time frame to measure the influence of the course. Also, allow for feedback while the students are working on their lifestyle journal to help them learn to modify lifestyle goals.

Conclusion

The clinical relevance to the current study would be to improving attitudes and beliefs of physical therapy students towards the overweight, and obese population and decreasing weight stigma could have a positive effect on their treatment of the obese population and their quality of care. Academic relevance would be to encouraging physical therapy students' health habits during their graduate education to prepare them to work with the overweight and obese population offering them a betterment of care and promote health and wellness in their future patients.

Table 1. Mean (SD) and Frequency (%) of Characteristics of Participants by Gender at Baseline (N = 60)

Characteristics	Males n= 29	Females n=31	P-value

	Mean (SD)	Mean (SD)	
Age (years)	27.1 (8.1)	26.4 (4.9)	0.690[a]
Weight (lbs.)	178.0 (39.2)	136.6 (17.8)	0.000[a]
Height (cm)	176.6 (73.3)	163.5 (6.3)	0.000[a]
BMI (kg/m^2)	25.9 (5.0)	23.4 (3.8)	0.027[a]
Race	Frequency (%)	Frequency (%)	0.854[b]
African American	2 (6.9)	3 (9.7)	
Caucasian	12 (41.4)	14 (45.2)	
Hispanic	3 (10.3)	8 (25.8)	
Asian	3 (10.3)	8 (25.3)	
Other	2 (6.9)	1 (3.2)	

[a] Determined using independent t-test
[b] Determined using chi-square test (x^2)

Table 2. Physical Therapy Students' Scores for the Nutrition, Exercise, and Weight Management (NEW) Attitudes Scale

			NEW Attitudes Scale Baseline	**NEW Attitudes Scale Post AHP Course**	**NEW Attitudes Scale Post 6 Months**	**P-value [a]**	**P-value [b]**
		n	Mean Score($SD^{\S}$) [min, max]	Mean Score ($SD^{\S}$) [min, max]	Mean Score($SD^{\S}$) [min, max]		
Gender	Male	29	-36.8 (13.8) [-71,-3]	-31.4 (19.6) [-74,3]	-24.2 (23.1) [-81,17]	.063	**.002**
	Female	31	-33.5 (18.8) [-67,13]	-32.7 (18.5) [-62,1]	-26.5 (18.7) [-57,29]	.468	**.012**
Total		60	-35.1 (16.5) [-71,13]	-32.1 (18.9) [-74,3]	-25.4 (20.8) [-81,29]	.065	**.000**

[a]: the p-value for comparing the scores from NEW-baseline to NEW-post AHP course
[b]: the p-value for comparing the scores from NEW-baseline to NEW post 6 months (AHP course + clinical affiliations)

Table 3. Frequency (%) of Responses to Significant Questions of the NEW Attitudes Scale from Baseline Over Time

	Baseline			**6 Months**			**Baseline 6 months**	**12 Months**			**Baseline 12 months**
	Freq. (%) agree	Freq. (%) neutral	Freq. (%) disagree	Freq. (%) agree	Freq. (%) neutral	Freq. (%) disagree	**P-value**	Freq. (%) agree	Freq. (%) neutral	Freq. (%) disagree	**P-value**
2	23/59 (98.3)	10/60 (16.7)	26/60 (43.3)	27/60 (45.0)	14/60 (23.3)	19/60 (31.7)	0.170	32/60 (53.3)	15/60 (25.0)	13/60 (21.7)	**0.008**
4	3/60 (5.0)	19/60 (31.7)	38/60 (63.3)	2/60 (3.3)	9/60 (15.0)	49/60 (81.7)	**0.005**	4/60 (6.7)	15/60 (25.0)	41/60 (68.3)	0.741
7	11/60 (18.3)	23/60 (38.3)	26/60 (33.3)	7/60 (11.7)	21/60 (35.0)	32/60 (53.3)	**0.041**	11/60 (18.3)	28/60 (46.7)	21/60 (35.0)	0.431
10	19/60 (31.7)	28/60 (46.7)	13/60 (21.7)	27/60 (45.0)	28/60 (46.7)	5/60 (8.3)	**0.018**	25/60 (41.7)	20/60 (33.3)	15/60 (25.0)	0.527
12	1/60 (1.7)	6/60 (10.0	53/60 (88.3)	3/60 (5.0)	5/60 (8.3)	52/60 (86.7)	0.465	4/60 (6.7)	10/60 (16.7)	46/60 (76.7)	**0.053**
16	1/60 (1.7)	9/60 (15.0)	50/60 (83.3)	8/60 (13.3)	15/60 (25.0)	37/60 (61.7)	**0.001**	6/60 (10.0)	18/60 (30.0)	36/60 (60.0)	**0.000**
17	8/60 (13.3)	41/60 (68.3)	11/60 (18.3)	5/60 (8.3)	37/60 (61.7)	18/60 (30.0)	**0.033**	13/60 (21.7)	33/60 (55.0)	14/60 (23.3)	0.707
18	6/60 (10.0)	14/60 (23.3)	40/60 (66.7)	4/60 (6.7)	20/60 (33.3)	36/60 (60.0)	0.747	15/60 (25.0)	22/60 (36.7)	23/60 (38.3)	**0.001**
19	7/60 (11.7)	33/60 (55.0)	20/60 (33.3)	9/60 (15.0)	37/60 (61.7)	14/60 (23.3)	0.102	14/60 (23.3)	38/60 (63.3)	8/60 (13.3)	**0.001**
21	60/60 **(100.0)**			53/60 (88.3)	5/60 (8.3)	2/60 (3.3)	**0.014**	56/60 **(93.3)**	4/60 **(6.7)**		**0.046**
23	54/60 (90.0)	4/60 (6.7)	2/60 (3.3)	44/60 73.3)	9/60 (15.0)	7/60 (11.7)	**0.004**	48/60 (80.0)	9/60 (15.0)	3/60 (5.0)	0.138
24	32/60 (53.3)	15/60 (25.0)	13/60 (21.7)	29/60 48.3)	9/60 (15.0)	22/60 (36.7)	0.127	22/60 (36.7)	17/60 (28.3)	21/60 (35.0)	**0.041**
26	22/60 (36.7)	20/60 (33.3)	18/60 (30.0)	33/60 (55.0)	13/60 (21.7)	14/60 (23.3)	**0.036**	29/60 (48.3)	13/60 (21.7)	18/60 (30.0)	0.175
29	9/60 (15.0)	20/60 (33.3)	31/60 (51.7)	8/60 (13.3)	17/60 (28.3)	35/60 (58.3)	0.394	11/60 (18.3)	28/60 (46.0)	21/60 (35.0)	**0.071**

Table 4. Frequency (%) of Responses to Significant Questions of the New Attitudes Scale from Baseline Over Time.

Item		**Baseline 6 Months**	**Baseline 12 months**
2	It is usually sufficient to give a person brief, clear advice about weight management	0.170	**0.008**
4	I find it rewarding to talk to someone about nutrition.	**0.005**	0.741
7	I have a personal desire to counsel patients about nutrition.	**0.041**	0.431
10	Patients are likely to follow an agreed upon plan to increase their exercise.	**0.018**	0.527
12	I have a personal desire to counsel patients about exercise	0.465	**0.053**
16	I believe patients can maintain weight loss.	**0.001**	**0.000**
17	I think obese patients are motivated to change their lifestyle.	**0.033**	0.707
18	I feel effective in helping overweight/obese patients manage their weight.	0.747	**0.001**
19	I believe that my patients will follow through with a weight management program	0.102	**0.001**
21	I think treating overweight/obese patients is not worth the time.	**0.014**	**0.046**
23	I do feel a bit disgusted when treating a patient who is obese.	**0.004**	0.138
24	If a patient is overweight/obese, I feel awkward discussing his/her weight	0.127	**0.041**
26	Patients know the health risks related to their weight.	**0.036**	0.175
29	I have a personal desire to counsel patients about weight management.	0.394	**0.071**

Table 5. Statements of the New Attitudes Scale That Showed No Significant Change from Baseline Over Time.

Item	Statement	**Baseline 6 Months**	**Baseline 12 months**
1	There is no excuse for a patient to be overweight/obese	0.391	0.608
3	People can eat a healthy diet if they choose to do so	0.294	0.097
5	Counseling about nutrition does not change behavior.	0.112	0.074
6	I believe if I eat a healthy diet it would make me an effective role model.	0.444	0.531
8	Patients understand the connection between nutrition and cancer.	0.154	0.253
9	The American food culture contributes to the overweight/obese problem	0.581	0.180
11	Even if I counsel them, patients will continue their poor exercise habits.	0.077	0.206
13	Overweight individuals tend to be lazy about exercise.	0.059	0.149
14	Patients understand the connection between exercise and cancer	0.366	0.439
15	Patients think lack of exercise can be a serious health risk.	0.546	0.565
20	I feel confident treating overweight/obese patients	0.849	0.369
22	Weight management counseling takes too much time.	0.715	0.193
25	The person and not the weight is the focus of weight management counseling.	0.363	1.000
27	Patients take their weight seriously.	0.253	0.865
28	Patients understand the connection between weight and cancer	0.682	1.000
30	Overweight/obese individuals lack will power.	0.766	0.674
31	Patients think being overweight/obese is a serious health risk.	0.483	0.417

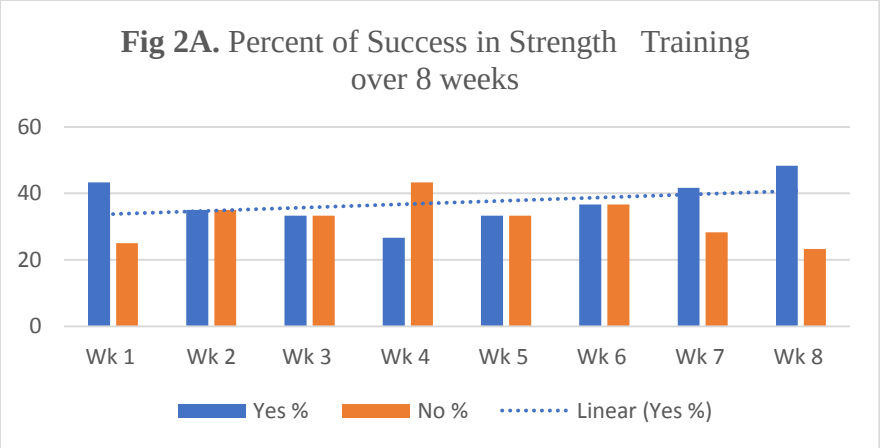
Fig 2A. Percent of Success in Strength Training over 8 weeks
60
40
20
0
Wk 1
Wk 2
Wk 3
Wk 4
Wk 5
Wk 6
Wk 7
Wk 8
Yes %
No %
Linear (Yes %)

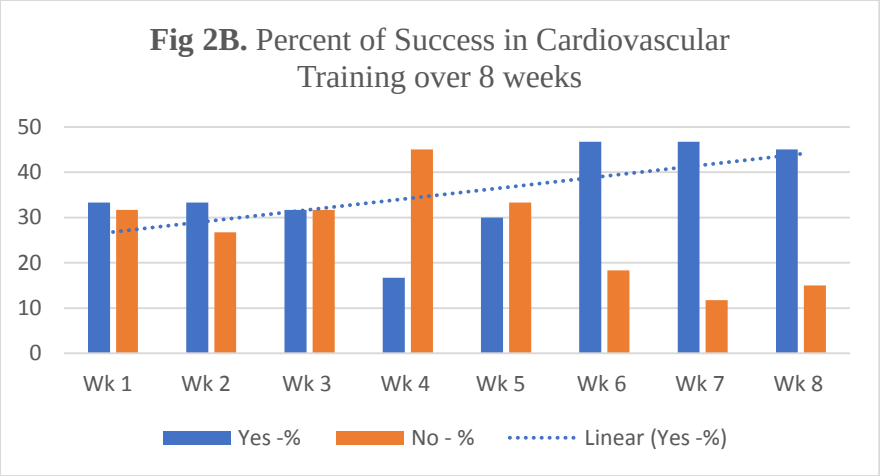
Fig 2B. Percent of Success in Cardiovascular Training over 8 weeks
50
40
30
20
10
0
Wk 1
Wk 2
Wk 3
Wk 4
Wk 5
Wk 6
Wk 7
Wk 8
Yes -%
No - %
Linear (Yes -%)

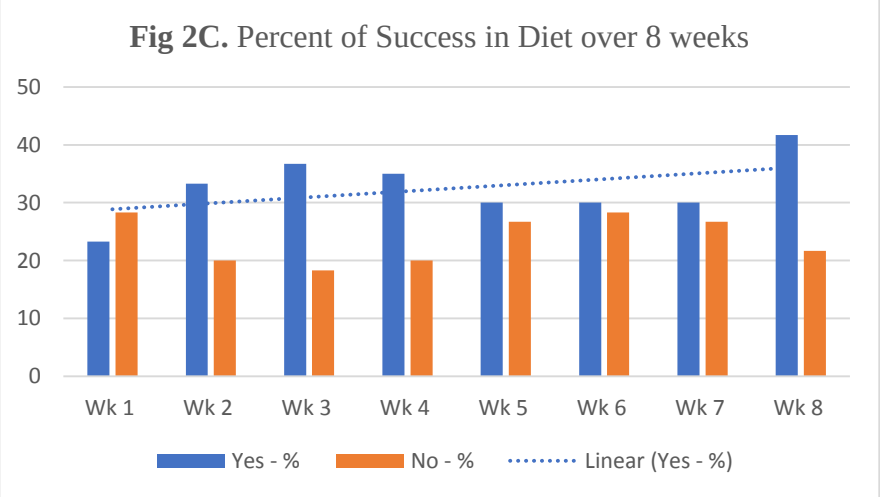
Fig 2C. Percent of Success in Diet over 8 weeks
50
40
30
20
10
0
Wk 1
Wk 2
Wk 3
Wk 4
Wk 5
Wk 6
Wk 7
Wk 8
Yes - %
No - %
Linear (Yes - %)

Fig 2D. Percent of Success in Spiritual Development over 8 weeks

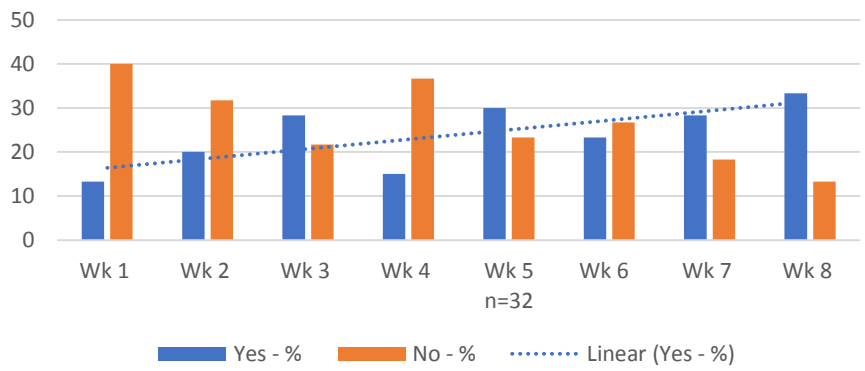

Fig 2E. Percent of Success in Social Development over 8 weeks

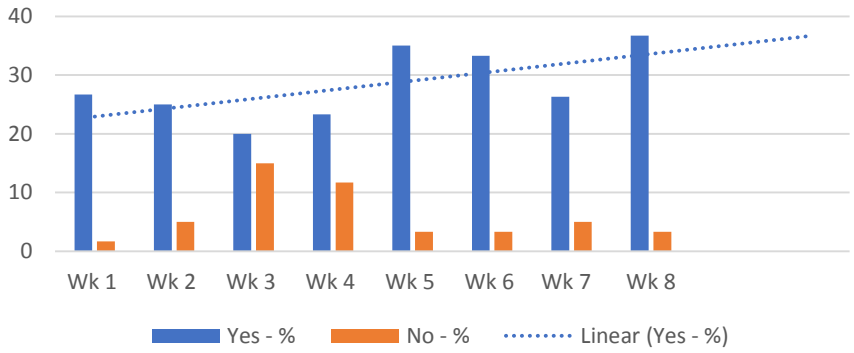

Fig 2F. Percent of Success in Sleep Quality over 8 weeks

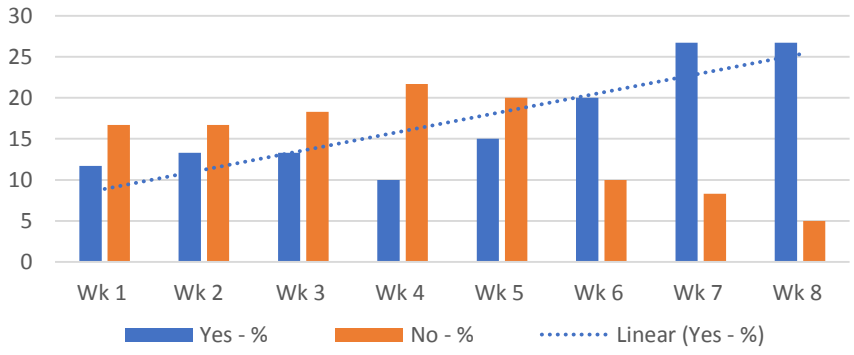

Table 6. Peer Group Classification (Time Management, Motivation, Illness/Pain, and Media) Barriers to Lifestyle Change.

Time Management (59%)	**Motivation (28%)**	**Illness/Pain (10%)**	**Media (3%)**
Unrealistic Goals	Lazy	Pain	TV
Busy	Tired	Soreness	Phone
Forgetfulness	Priorities	Feeling sick	Social Network
Routine	Weather		
No time	Social responsibilities		

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CHAPTER THREE

RELATIONSHIP BETWEEN DOCTOR OF PHYSICAL THERAPY PERCEPTIONS OF OBESITY STIGMA AND THEIR PHYSIOLOGICAL HEALTH

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Abstract

Purpose: Studies have examined students preparing to enter the health care field as well as health care providers on their attitudes towards the overweight and obese population. This study is designed to assess physical therapy students' attitudes towards overweight and obesity population when involved in Aspects for Health Promotion course, self-examination, and clinical experience.

Methods: A Questionnaire at baseline was completed by 60 doctors of physical therapy students one-quarter before being enrolled in Aspects of Health Promotion (AHP). The questionnaire used is the Nutrition, Exercise, and Weight Management (NEW) Attitudes Scale. During the first week of the AHP, students had lab values drawn for HbA1c, hs-CRP, total cholesterol, HDL, and Triglycerides. Upon completion of the AHP course, the NEW Attitudes Scale was administered. The final questionnaire was completed once students returned from their clinical affiliation at 12 months.

Results: Comparing baseline to 12 months, there was a significant increase in NEW Attitudes Scale score for males, females and total participants, ($P = 0.002$), ($P = 0.012$), ($P = 0.000$) respectively. Comparing baseline to 6 months, there was a significant change in score for subjects whose HDL levels were between 40 to 50 ml/dL and subjects whose hs-CRP were greater than 2, ($P = 0.039$), ($P = 0.009$). From baseline to 12 months all scores significant change except for subjects whose triglyceride levels were $\geq$ 150 ml/dL ($P = 0.893$).

Conclusion: Combining curricular education on obesity stigma, self-assessment of blood work and clinical experience, attitudes, and beliefs towards weight stigma decreased. Recommendations are for students in graduate work preparing to enter the health care,

participate in self-evaluation of health, including blood tests. Further studies are recommended to measure physiological health and student perceptions.

Key Words: Weight stigma, Weight bias, Heath Care Provider, Lifestyle

Introduction

The World Health Organization reports that noncommunicable (NCD) diseases kill 41 million people each year, which is equivalent to 71% of all deaths globally[1]. Noncommunicable diseases (NCDs), such as heart disease, stroke, cancer, chronic respiratory diseases, and diabetes, are the leading cause of mortality in the world[2]. A fundamental modifiable factor for NCD is overweight and obesity[3].

The epidemic of overweight and obesity levels is well documented in the literature[4,5]. Obesity rates in adults have neared 70 % in the U.S. population[6]. The National Institute of Health (NIH) reports the prevalence of overweight/obese for adult males to be 73.3 % and for females 66.9%[6]. Childhood overweight and obesity rates will increase to a prevalence of 30 % by the year 2030[7].

Weight stigma in several studies has been defined with descriptors such as negative weight-related attitudes[8], social devaluation, and denigration[9] and an acceptable form of bias toward individuals that are obese or overweight[10]. In a study by Puhl et al., found the prevalence of weight discrimination similar to that of race discrimination, principally among women[11].

Overweight individuals have been stereotyped as lazy, noncompliant, weak-willed, and uninterested in their health by healthcare providers[12]. Healthcare providers such as physicians, psychologist, nursing health professionals[13,14] and physical therapist[15] are associated with negative weight bias. Students emulating the obesity stigma preparing

for the healthcare field are dental hygiene[16], dietetics[17], physical therapy[18], and medical students[19].

Generalizing overweight individuals as unhealthy assumes all overweight individuals are unhealthy and thus fall into a category of lazy[20], unmotivated, lack self-control and willpower[14]. Devaluating overweight/obese individuals with such derogatory descriptors socially marginalizing them is considered stigmatizing[21]. A study by Shin et al., examining subjects that were obese, found less visceral fat accumulation, and were metabolically healthy. Shin described them as metabolically healthy but obese (MHO).[22] Buckner et al., compared subjects that were normal weight and unfit, unfit and overweight, unfit obese and obese and fit, all showed higher levels of hs-CRP. However, comparing normal weight and unfit to overweight and fit, there were no differences in hs-CRP levels. Comparing normal weight unfit adults too overweight fit adults, the overweight fit adults had a lower hazard rate for all-cause mortality[23]. Himmelstein et al., revealed female undergraduate students who perceived themselves as heavy, regardless of objective BMI, had elevated cortisol levels, which has been linked to abdominal obesity[24]. The sordid effect of weight stigma finds itself to individuals that are not overweight or obese at all. Hebl et al. showed individuals that even sit in proximity to an obese individual were rated negatively, and if a male sat next to an overweight female, it was enough to trigger stigmatization towards the male when applying for a job[25].

A study by Vadiveloo et al., found a relationship experiencing weight discrimination, which appeared to promote unhealthy effects on hs-CRP, HbA1c, HDL, LDLs[26]. Higher levels of circulating hs-CRP, an inflammatory marker[27], have been associated with weight stigma, which in turn, influences the health outcome of the

overweight/obese individual[28]. Children whose parents perceive them as overweight, Sutin et al., found higher levels of hs-CRP compared to children whose parents perceived them as healthy weight. Regardless of BMI or waist circumference, the association remained[29]. Examining weight discrimination concerning BMI, waist-to-hip ratio, and waist circumference, there was a significant finding of weight discrimination exacerbating all three resulting in higher HbA1c[30]. Higher weight stigma is associated with higher HbA1c, which may increase the risk of type 2 diabetes, and higher weight stigma is also associated with an increased risk of becoming obese[31] and staying obese[32]. Wu et al. found that the higher the weight stigma, the higher the deleterious effects on physiological health such as diabetes early risk, oxidative stress level, and hs-CRP[33]. Independent of abdominal fat, weight stigma is related to cortical levels, thereby making a plausible relationship between weight stigma to poor health[34]. Individuals who have accepted the societal weight stigma have an elevated cardiometabolic risk, due to the higher the Internalizing weight bias (WBI), the greater the odds of having higher triglycerides[35].

Pavela el al., found hs-CRP levels to be associated with obesity and disease[36]. Social isolation is associated with increased hs-CRP levels in coronary heart disease[37]. In a study by Song et al., found a significantly higher serum hs-CRP levels in patients with Alzheimer's disease[38]. Elevated hs-CRP levels have been independently identified to predict risk for both cardiovascular mortality and all-cause mortality[39] and associated with cancer[40,41].

With the negative associations between the health of an individual and obesity stigma, the complexities of obesity must be addressed in the curriculum for future

healthcare providers[42]. Students will inevitably manage the care of overweight/obese patients in their specific field due to the rates of this population[6]. A curriculum has been called for to address the obesity stigma and to have students reflect on their biases[43], enhancing students awareness to the complex etiology of obesity[19,44,45]. A curriculum should encourage students to gain a multifaceted understanding and knowledge when working with patients of all sizes[46].

Physical therapists can spend a significant amount of time with patients making them exceptionally positioned as healthcare providers to discuss and promote health and wellness with their patients[47]. Unfortunately, physical therapists are not immune to the obesity stigma, in that Sack et al., found that 50 % of the physical therapist respondents to the survey held negative beliefs towards obese individuals and 40 % felt they were lazy[18]. Negative weight stigma may poorly impact patient care[46], which could lower physical activity[48].

Curricular changes in students preparing to become healthcare providers need to be implemented to reduce stigmatization towards the overweight/obese population, thus improving the quality of patient care [49,50]. The quality of life for patients that are overweight/obese could be hindered with a negative bias, and their quality of care can be impaired[46]. So it is the purpose of this study to measure a change in perceptions of obesity stigma using the Nutrition, Exercise and Weight Management (NEW) Attitudes scale, by way of curricular education and student self-evaluation in the second-year doctor of physical therapy (DPT) students.

Methods

Participants were recruited from a cohort of 60 second-year DPT students, 29 males and 31 females, enrolled in a required Aspects of Health Promotion (AHP) curricular course at Loma Linda University. Participants were required to complete all assignments and pass the AHP course with a satisfactory grade in adherence to LLU standards.

Subjects participated in self-assessment tools such as a (NEW) Attitudes Scale [51], lipid profile, hs-CRP, HbA1c, and in-class assignments. All tools utilized were part of standard course materials, except for the NEW Attitudes Scale. A double-blind study was designed to minimize instructor and participant bias. Blinding covered lipid panel, hs-CRP, HbA1c, and survey results.

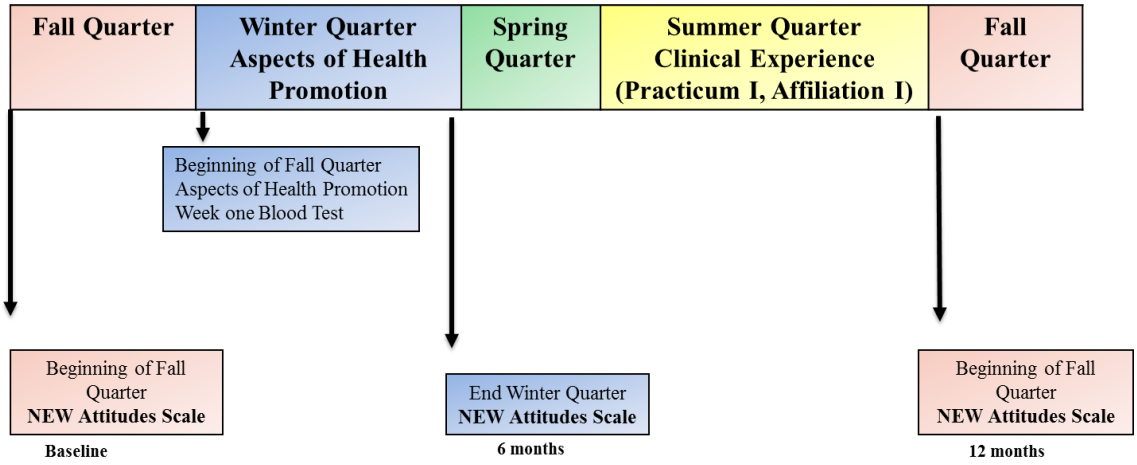
Sack et al., studied physical therapist relationship between attitudes and knowledge regarding obesity[18], employing the use of a survey used to study attitudes of physicians by Foster and colleagues[52]. The survey used was modified to tailor the scope of practice of physical therapists. In a study by Ip et al., a survey instrument was created (Nutrition, Exercise, and Weight Management Attitude Scale) and correlated alongside the Anti-Fat Attitudes Questionnaire (AFA) and the Beliefs About Obese Persons Scale (BAOP), and used to measure medical students' beliefs and attitudes towards obese patients. Ip and colleagues determined their scale to be both valid and reliable to use for future studies. The current study employed the use of the NEW Attitudes scale without modification. The NEW Attitudes scale does not suggest prescribing medication as the questionnaire of Foster and colleagues[52], thus making it desirable to use with physical therapists having direct access[53].

The NEW Attitudes Scale is both valid and reliable and was developed to measure obesity bias such as anti-fat, self-efficacy belief about how others understand obesity [51]. To improve validity, distractor questions were embedded with The NEW Attitudes Scale questionnaire. The NEW Attitudes Scale questionnaire was taken at three distinct times (Figure 1). Baseline at the beginning of fall quarter, baseline to 6 months after the AHP course, and baseline to 12 months at the beginning of fall quarter the following year returning from their clinical affiliation.

As part of the AHP course, student lipid profiles were assessed via fasting blood tests, administered at the beginning of the AHP course and the conclusion of the quarter. Samples were coded to protect privacy. Measurements taken included hs-CRP, HbA1C, Cholesterol, LDL, HDL, and Triglycerides. The blood test was during the first week of the quarter, to avoid the stress of exams or quizzes. Meduka et al. studied undergraduate students under examination stress and lipid profile and cortisol levels and found a significant negative relationship between them both[54].

Procedures

Figure 1. Timeline showing curricula (AHP), blood test when the NEW Attitudes Scale was administered.



To disguise study purpose, and to utilize a specified timeline, the first NEW Attitudes Scale questionnaire was administered, in fall quarter before the AHP course in winter. In winter quarter following the AHP course and finally six months after returning from clinical affiliations.

During the first week of the quarter, DPT students had their fasting blood draw in the morning. Each student was given a code, to blind the researcher and the phlebotomist to the subjects. On the second week, students received their results.

Course modules included physiology of obesity and how hunger is driven by physiology, environmental factors such a food availability, social and socioeconomic factors, stress-related factors, nutrition/diet, metabolism of obesity, genetic and microbial influences in obesity, obesity stigma, marketing strategies used to confuse consumers, research analysis and exercise.

Results

Characteristics of participants at baseline include gender, BMI (kg/m^2), lipid panel, hs-CRP, HbA1c, and ethnicity (Table 1). Participants included 29 males (48.3 %) and 31 females (51.7 %) (Table 1). Comparing age and race between males and females, there was no significant difference (P = 0.854, P = 0.690, respectively). For weight, height and BMI there was a significant difference at baseline (P = 0.000, P = 0.000, P = 0.027 respectively).

For males, females and total participants from baseline to 6 months, there were no significant change in scores (P = 0.063, P = 0.468, P = 0.065 respectively). From baseline to 12 months, males, females and total participants had a significant improvement in scores (P = 0.002, P = 0.012, P = 0.000 respectively) as shown in Table 2.

We used the Adult Treatment Panel III report released by the American College of Cardiology (ACC) and the American Heart Association (AHA)[83]. We conducted a blood test at baseline, which included total cholesterol, HDL, Triglycerides, HbA1c, and hs-CRP. Lab values were measured against the NEW Attitude Scale at six months and 12 months.

From baseline to 6 months, the only two groups that showed a significant improvement in scores were subjects whose HDL levels were between 40 to 50 mm/dl and subjects whose hs-CRP were greater than 2 mg/L (P = 0.039 and P = 0.009 respectively). From baseline to 12 months, all group showed a significant improvement in score except subjects whose triglyceride levels were $\geq$ 150 mm/dl, (P = 0.089). There were only five subjects whose triglycerides levels were in an unhealthy range (Table 3).

Discussion

The current study examined changes in score of the NEW Attitudes Scale of DPT students to their lab values of Total cholesterol, HDL and triglycerides, along with hbA1c and hs-CRP. All subjects showed a significant improvement in the scores at 12 months, except subjects whose triglyceride levels were in the unhealthy range.

From baseline to 6 months, men showed a trend towards significant improvement in score, while females did not. However, at 12 months, there was a significant improvement in score for both males and females. We believe a plausible explanation for the difference in scores at six months, could be that women have been stigmatized to a greater extent than males[77] and due to the social demands on women[78], they may carry a more considerable amount of weight-based stigma than men[84]. Seacat et al., support women experience a higher amount of stigma than men. Hesse-Biber et al., report the social demands on females to be beautiful and thin, while You et al., find younger female professionals demonstrate a strong weight bias, both supporting the current study for the baseline to 6 months' scores.

From baseline to 12 months, all subjects showed a significant increase in scores except for subjects whose triglyceride levels in the unhealthy range. There were only five subjects in this category which would lessen the significance, however Frank et al., found a consistent and robust relationship between the physicians who had their cholesterol tested and improved their diet improved their patient counseling[85]. The NEW Attitudes Scale is based on attitudes and beliefs concerning patient interaction and counseling, which could explain the relationship between lipid levels and their attitudes and beliefs.

Comparing baseline scores at six months to 12 months, for total participants (Table 2), there was a significant improvement in the scores at 12 months. The current study suggests there was an influence of their attitudes and beliefs while out on their affiliation. Cox and colleagues 2017, supports the influence of clinical experience influencing attitudes and beliefs, showing their students had improved scores after intervention. However, after their clinical experience, scores returned to baseline. Ip and colleagues support as well the influence of patient interaction, which scores decreased from baseline[73]. While both studies support the influence of clinical experience and patient interaction, the current study shows that students' scores significantly improved after the clinical experience.

The strength of this study was the re-evaluation over time. From baseline to the final assessment was 12 months, which included course work and clinical experience. While this study intended to examine doctor of physical therapy students, the sample size was limited to class size and specific to a health care discipline.

Recommendations for future studies would be to have a blood test on the final assessment. Case studies of obese and overweight patients in the curriculum to prepare them for their affiliations. Questionnaires to determine the background of the subject of personal weight challenges.

The clinical relevance to the current study would improve the health of the student, allow them to track their changes in health, to better improve their attitudes and beliefs towards weight-based stigma. Curricular relevance would be to promote a healthy lifestyle change in students throughout their education. Frank et al., found predictors of

physicians counseling patients and health and wellness, would be attending a school that encourages healthy personal practices[86].

Table1. Frequency (%) and Mean (SD) of Characteristics of Participants by Gender at Baseline (N=60)

Characteristics	Male n = 29	Female n = 31	P-value[a]
Race	Frequency (%)	Frequency (%)	.854
African American	2 (6.9)	3 (9.7)	
Caucasian	12 (41.4)	14 (45.2)	
Hispanic	3 (10.3)	5 (16.1)	
Asian	10 (34.5)	8 (25.8)	
Other	2 (6.9)	1 (3.2)	
	Mean (SD)	Mean (SD)	P – value [b]
Age (years)	27.1 (8.1)	26.39 (4.9)	0.690
Weight (lbs.)	178.0 (39.2)	136.61 (17.8)	0.000
Height (cm)	176.6 (7.3)	163.46 (6.3)	0.000
BMI (kg/m^2)	25.9 (5.0)	23.34 (3.8)	0.027

[a] Determined using chi-square test (χ^2).
[b] Determined using independent t-tests.

Table 2. Mean Score (SD) of the NEW Attitudes Scale by Gender Over Time (N = 60)

			NEW Attitudes Scale Baseline	**NEW Attitudes Scale Post AHP Course**	**NEW Attitudes Scale Post 6 Months**	**P-value [a]**	**P-value [b]**
		n	Mean Score(SD[§]) [min, max]	Mean Score (SD[§]) [min, max]	Mean Score(SD[§]) [min, max]		
Gender	Male	29	-36.8 (13.8) [-71,-3]	-31.4 (19.6) [-74,3]	-24.2 (23.1) [-81,17]	.063	**.002**
	Female	31	-33.5 (18.8) [-67,13]	-32.7 (18.5) [-62,1]	-26.5 (18.7) [-57,29]	.468	**.012**
Total		60	-35.1 (16.5) [-71,13]	-32.1 (18.9) [-74,3]	-25.4 (20.8) [-81,29]	.065	**.000**

[a]: the p-value for comparing the scores from NEW-baseline to NEW-post AHP course
[b]: the p-value for comparing the scores from NEW-baseline to NEW post 6 months (AHP course + clinical affiliations)

Table 3. Comparison of Mean Score (SD) of NEW Attitudes Scale Over Time by Baseline Lipid Panel, HbA1c, and hs-CRP

			Baseline	Baseline to 6 months	Baseline to 12 months	P-value [a]	P-value [b]
Total Chol	<200	59	-35.1 (16.6) [-71,13]	-32.0 (19.0) [-74,3]	-24.9 (20.5) [-81,29]	.060	**.002**
	≥200					.317	.317
HDL	<40	18	-34.5 (19.6) [-60,13]	-35.3 (20.3) [-66,3]	- 24.7 (22.9) [-56,29]	.722	**.032**
	≥50	21	-33.6 (16.8) [-67,-3]	-31.7 (17.3) [-62,7]	-22.3 (19.3) [-57,17]	.313	**.006**
	40-50	21	-37.1 (13.9) [-71,-14]	-29.8 (19.8) [-74,2]	-29.1 (20.8) [-81,-1]	**.039**	**.042**
TRIG	≥150	5	-22.2 (17.7) [-43,0]	-23.6 (17.9) [-39,2]	-16.40 (29.9) [-59,12]	.893	.893
	≤150	55	-36.3 (16.1) [-71,13]	-32.87 (18.9) [-74,3]	-26.2 (19.9) [-81,29]	.054	**.000**
HbA1c	≥5.7	8	-30.4 (15.9) [-50,-3]	-23.6 (18.6) [-56,3]	-15.8 (15.3) [-33,15]	.262	**.025**
	<5.6	52	-35.8 (16.6) [-71,13]	-33.4 (18.8) [-74,2]	-26.90 (21.2) [-81,29]	.117	**.000**
Hs-CRP	≥ 2	16	-37.8 (15.0) [-67,-8]	-27.75 (19.7) [-60,3]	-23.4 (18.0) [-57,12]	**.009**	**.001**
	< 2	44	-34.1 (17.1) [-71,13]	-33.7 (18.6) [-74.2]	-26.2 (21.7) [-81,29]	.608	**.004**

Abbreviation: Total Cholesterol mg/dL (Total Chol), High-Density Lipoprotein mg/dL, (HDL), Triglycerides mg/dL (TRIG), Hemoglobin A1c (HbA1c), high-sensitivity C-reactive protein mg/L (hs-CRP). Standard Deviation (SD)

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CHAPTER FOUR

DISCUSSION

The current study, doctor physical therapy (DPT) students participated in self-evaluation by way of blood tests, lifestyle journaling, self-assessment tests (Insomnia Severity Index, Perceived Stress Scale, Self-motivation Scale for Compliance, Physical Activity Stages of Change and online physiological age assessment). The purpose of these tests and measures were to answer the question, "Does Self-Assessment in the doctor of physical therapy students change the perception or correlate with weight stigma."

Weight stigma can affect many facets of individuals that are overweight or obese. Teachers (28%) agreed that becoming obese is the worst thing that could happen to a person, felt they were untidy (20%) and less likely to succeed at work (20%)[87]. In a study by Puhl et al., found that parents that have both children that are obese and children that are of normal weight gave less educational support to their obese child[87]. Children have reported being stigmatized from both parents with mothers at 53% and fathers at 44%[31]. Health care providers are not exempt from weight-based stigma; characterizing overweight individuals have as lazy, noncompliant, undisciplined, weak-willed, and uninterested in their health[31]. These characteristics move patients to refrain from medical care[58].

Curricular education to minimize weight stigma has been recommended for health care providers while in graduate school[59,88]. O'Brien et al., reports anti-fat prejudice can either be reduced or exacerbated depending on curricular education[60]. The current study involved curricular education to focus on weight stigma while students were being self-

evaluated. A blood test was done to measure the student's physiological health status. Healthy levels of HbA1c, hs-CRP, and lipid profile correlated with improved knowledge and beliefs toward overweight and obese population in physical therapy students. These results correlate with physicians knowing their cholesterol levels and being more willing to counsel patients in cholesterol levels[89]. Medical students being educated in healthier eating habits, and improving their habits, improved likelihood to counsel patients on lifestyle behavior[90].

Lifestyle behavior was examined by way of lifestyle journaling in DPT students. Four categories were created depicting barriers identified by the students while doing their weekly lifestyle journaling. Lazy and tired are in quotations depicting verbal written by students in their journal. Time management (unrealistic goals, busy, forgetfulness, out of routine- 59%), Motivation ("lazy", "tired", priorities, weather, social responsibilities - 28%), Illness/Pain (soreness, feeling sick and having pain - 10%) and Media (TV, phone, social network – 3%). Our study found that the highest barriers to reaching goals were Time Management, followed by Motivation. Al-Kaabi et al., looking at patients with type 2 diabetes and examining their barriers to following a recommended exercise program, found lack of time 29.7 %, weather 7.9 % and laziness 1.0 % as the second, sixth and 11th highest barriers respectively[91]. In a study by Yang et al., examining cancer patients and their barriers to physical activity, lack of time rated the second highest barrier 27% and motivation as the 7th highest barrier to reaching their goals[92]. Undergraduate student barriers were identified as being busy, and social responsibilities were the highest ranked barriers[81]. Senior citizens barriers to exercise included motivation and embarrassment[93].

The current study found a significant improvement in knowledge and beliefs towards patients with obesity when tested on the NEW – post six months' questionnaire. This change in score correlated with medical students change in score in a study by Ip et al.,[73] using the NEW Attitudes Scale. This change in knowledge of attitudes and beliefs could improve patient care in physical therapy students.

In an anecdotal example, a 14-year-old girl name Gina was sent to a juvenile detention camp. Gina was described as sensitive, intelligent, and known to write poetry. Her punishment was due to stealing money to buy food, which she paid most of the money back. While at the camp, she was forced on a 2.7-mile run/walk. Gina was 5'4" tall and weighed 224 lbs. Gina could not finish the run collapsing to the ground, while the instructors thought her to be faking sat by drinking sodas. After 4 hours of being in the hot sun, a doctor came by and called for an ambulance. Gina went into organ failure and died. While no health care provider would treat a person in such a way, consider that obesity is associated for all-cause mortality, and a risk factor for a plethora of co-morbidities that drive mortality such as cardiovascular disease, type 2 diabetes, cancers and chronic diseases such as liver and kidney disease[11]. Weight stigma is closely associated with gaining weight[5,94], increased HbA1C[94,95] and hs-CRP[96], eating disorders[97], depression[98], and lack of desire to exercise[99].

Creating a healthier environment in graduate school could influence future healthcare providers to promote health[89]. Encouraging healthy eating habits in graduate school increased perceived awareness of their dietary choice, in turn, increasing the likelihood to advise patients on lifestyle behavior[90].

In a 2012 documentary Escape Fire: The Fight to Rescue American Healthcare[100], a story is told of a fire in 1949 that broke out in Mann Gulch Montana. A team of 15 smoke jumpers caught in a line of a fire burning at a speed of about 600 ft. per minute. Robert Wagner "Wag" Dodge lit a match and started a fire at his own feet, creating the first known "escape fire." Robert called out to the others, but they either did not hear, or they ignored him. Robert lay face down in the newly burned area and escaped the fire, while the others did not survive. The answer was there, but the status quo did not allow for new ideas. So the movie portrays the status quo of healthcare today. This author believes that unless healthcare providers move away from the status quo of weight loss and negate moving towards a health-focused treatment, leaving negative perceptions aside, weight stigma will continue to devalue patients and hinder their efforts to escape the fire obesity and stigma.

Curricular Applications

- To minimize ill effects of weight stigma education must begin in graduate curricula to include:
    - Complexities of obesity
    - Exercise prescription for overweight and obese patients
    - Communication with obese and overweight patients
    - Health Promotion
    - Nutrition
- Creating a healthy lifestyle while students are in their graduate courses
- Education in nutrition for students while in graduate courses
- Screening students in graduate programs for HbA1c, hs-CRP and lipid panel
- Lifestyle journaling
- Test graduate students' attitudes and beliefs

Clinical Application

- Remain current with the complexities of obesity
- Learning how to communicate with obese and overweight patients
- Continuing education on nutrition, exercise prescription for the obese and overweight population
- Learning to differentiate research that has no conflict of interest between corporations and study results[101]
- Consider the overweight/obese patients past struggles[95,102]
- Move away from weight centered treatment to health-centered treatment[103]

In summary, Educators and clinicians need to address weight-related stigma, which calls for more education, awareness of bias, focus on the complexity of obesity, to minimize the potential negative impact of care.

Curricula should directly address weight-related stigma, test the interventions, reflect on negative bias towards obese and overweight population to reduce anti-fat stigma for the betterment of patients care and quality of life.

APPENDIX A

NUTRITION, EXERCISE AND WEIGHT MANAGEMENT (NEW) ATTITUDES SCALE

Please respond by circling the number in the box that corresponds with your level agreement/disagreement with the statement.						
		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	There is no excuse for a patient to be overweight/obese.	1	2	3	4	5
2	It is usually sufficient to give a person brief, clear advice about weight management.	1	2	3	4	5
3	People can eat a healthy diet if they choose to do so.	1	2	3	4	5
4	I find it rewarding to talk to someone about nutrition.	1	2	3	4	5
5	Counseling about nutrition does not change behavior.	1	2	3	4	5
6	I believe if I eat a healthy diet it would make me an effective role model.	1	2	3	4	5
7	I have a personal desire to counsel patients about nutrition.	1	2	3	4	5
8	Patients understand the connection between nutrition and cancer.	1	2	3	4	5
9	The American food culture contributes to the overweight/obese problem.	1	2	3	4	5
10	Patients are likely to follow an agreed upon plan to increase their exercise.	1	2	3	4	5
11	Even if I counsel them, patients will continue their poor exercise habits.	1	2	3	4	5
12	I have a personal desire to counsel patients about exercise	1	2	3	4	5
13	Overweight individuals tend to be lazy about exercise.	1	2	3	4	5
14	Patients understand the connection between exercise and cancer	1	2	3	4	5
15	Patients think lack of exercise can be a serious health risk.	1	2	3	4	5

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
16	I believe patients can maintain weight loss.	1	2	3	4	5
17	I think obese patients are motivated to change their lifestyle.	1	2	3	4	5
18	I feel effective in helping overweight/obese patients manage their weight.	1	2	3	4	5
19	I believe that my patients will follow through with a weight management program.	1	2	3	4	5
20	I feel confident treating overweight/obese patients.	1	2	3	4	5
21	I think treating overweight/obese patients is not worth the time.	1	2	3	4	5
22	Weight management counseling takes too much time.	1	2	3	4	5
23	I do feel a bit disgusted when treating a patient who is obese.	1	2	3	4	5
24	If a patient is overweight/obese, I feel awkward discussing his/her weight	1	2	3	4	5
25	The person and not the weight is the focus of weight management counseling.	1	2	3	4	5
26	Patients know the health risks related to their weight.	1	2	3	4	5
27	Patients take their weight seriously.	1	2	3	4	5
28	Patients understand the connection between weight and cancer	1	2	3	4	5
29	I have a personal desire to counsel patients about weight management.	1	2	3	4	5
30	Overweight/obese individuals lack will power.	1	2	3	4	5
31	Patients think being overweight/obese is a serious health risk.	1	2	3	4	5

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