UNIVERSITY of INDIANAPOLIS.
College of Health Sciences

# DO PERSONAL HEALTH HABITS AND PERCEPTION OF ROLE MODELING OF PHYSICAL THERAPIST ASSISTANT STUDENTS' AFFECT EXPECTATIONS OF RECOMMENDING HEALTHY LIFESTYLE CHANGES TO PATIENTS?

Submitted to the Faculty of the
College of Health Sciences
University of Indianapolis

In partial fulfillment of the requirements for the degree
Doctor of Health Science
By: Dawn Miller, PT, ATC, MHA



Approved by:

Dr. Heidi L. Hancher-Rauch, Ph.D., CHES _____
Committee Chair

Dr. Amie Wojtyna, PhD, MSBS, MPH _____
Committee Member

Dr. Ginger Snead, DPT _____
Committee Member

Accepted by:

Laura Santurri, PhD, MPH, CPH _____
Director, DHSc Program
University of Indianapolis

Stephanie Kelly, PT, PhD _____
Dean, College of Health Sciences
University of Indianapolis

## TABLE OF CONTENTS

## ACKOWLEDGEMENTS

I would like to thank my Committee of Heidi L. Hancher-Rauch, Ph.D., CHES, Dr. Amie Wojtyna, PhD, MSBS, MPH, and Dr. Ginger Snead, DPT for their insight and guidance. A special thanks for Dr. Wojtyna in her assistance with performing and interpreting the statistical analysis. I would also like to thank my husband for his support, his understanding, and assuming many responsibilities throughout the course of the doctoral program.

## TABLES AND FIGURES

### Appendices



### Figures



### Tables

**ABSTRACT**

**Background and Purpose:** Several studies have looked at the personal health habits and role modeling attitudes of physical therapists (PTs), student physical therapists (SPTs), and physical therapist assistants (PTAs). No studies have examined the health habits and role-modeling attitudes in student physical therapist assistants (SPTAs). No studies were found that examined STPAs' expectations for recommending healthy lifestyle changes to their future patients.

**Methods:** A national sample of 335 SPTAs completed a questionnaire containing three surveys: a self developed survey on Expectations for recommending healthy lifestyle changes to patients (Expectations), the Role-Modeling Attitudes Questionnaire (RM), and the Health Promoting Lifestyle Profile II (HPLPII). The questions gathered data on the expectations of making healthy lifestyle changes to patients, personal health habits, and beliefs of the importance of role modeling healthy behaviors to patients. Results were analyzed using Chi-square test, Kolmogorov-Smirnov test, correlation analysis, multivariate logistic regression, and examination of co-linearity between variables.

**Results:** After removing questionnaires with incomplete data, the response rate was 29.7% (n=335). Most SPTAs perceived they will often or routinely educate their patients on meeting physical activity guidelines (76.4%), maintaining healthy weight (78.6%), and decreasing or stopping the use of tobacco products (77.9%). The majority of SPTAs agreed role modeling is a powerful teaching tool (95.5%), that physical therapy professionals should "practice what they preach" (95.2%). SPTAs also perceived that it is important for physical therapy professionals to perform and role model performing: the CDC recommended amounts of physical activity (perform: 92.2%; role model: 91.9%),

maintain healthy weight (perform: 91.8%; role model: 91.9%), and abstain from smoking (perform: 94.3%; role model: 93.4%). Educating patients on the importance of exercise was correlated with perceived importance of performing regular physical exercise ($\gamma$=0.39), role modeling regular physical exercise ($\gamma$=0.46), and HPLPII physical activity subscore ($\gamma$=0.42). The expectation of educating patients on the importance of maintaining healthy weight was strongly correlated with the importance of physical therapy professionals role modeling maintaining a healthy weight ($\gamma$=0.37) and had a moderately strong correlation with maintaining healthy weight ($\gamma$=0.44). The importance of educating patients on a healthy diet was strongly correlated with eating and role modeling eating five servings of fruit and vegetables (respectively, $\gamma$=0.41, $\gamma$=0.49) and the HPLPII Nutrition sub-score ($\gamma$=0.46).

**Conclusion:** Most SPTAs participate in healthy behaviors, feel that role modeling healthy behaviors is an important component of being a physical therapy provider, and that they should recommend healthy behavior changes to patients. However, the rate at which they perceive they will recommend healthy lifestyle changes to patients and their role modeling attitudes differ depending on the topic with stronger beliefs in the need to role model and educate patients on the topics of physical activity, weight, and diet. Current research is demonstrating that healthy behaviors are strongly associated with decreasing costly medical care, personal health habits of providers correlate to the health habit recommendations made to patients, and patients are more likely to follow the recommendations a provider makes when the provider role models healthy behaviors. Physical therapy providers are positioned to positively influence the health habits of their patients and potentially have a positive impact on overall public health.

## Introduction

Poor health habits and poor physical fitness are directly correlated with many costly and preventable causes of morbidity and mortality.[1-4] Unfortunately most patients receive only minimal and sporadic counseling on participating in preventive health measures and improving healthy behaviors during patient-provider interactions.[5] Primary care providers most frequently cite a lack of time, poor reimbursement and lack of patient interest as significant barriers to providing more frequent and thorough health counseling.[6-8] Prior research suggests that healthcare providers who maintain good personal health habits and physical fitness are more likely to recommend healthy lifestyle changes to their patients and to be more confident in their abilities to make these recommendations.[2] Additionally, patients treated by healthcare providers who role model healthy behaviors may be more likely to implement the recommendations for healthy lifestyle changes and report that the provider is trustworthy and credible when providing any health care information.[3]

An essential component of physical therapy is to provide patients information regarding their health and to effect changes in patient behaviors and attitudes in order to promote neuromusculoskeletal recovery and improve overall health. This includes exercise prescription and patient education on performing regular physical activity and healthy lifestyle modifications to prevent or control neuromusculoskeletal conditions. These are the same skills needed to counsel patients on improving health habits and physical fitness to prevent chronic diseases that result from sedentary lifestyles and poor health habits.[4,5] The frequency and length of physical therapy visits position physical therapists (PTs) and physical therapist assistants (PTAs) to have extended patient

interaction time.[2,3,5] Physical therapy providers are therefore more readily able to identify sedentary and unhealthy behaviors, decreased physical activity due to illness or injury, and to provide education on healthy lifestyle modifications and the importance of increasing physical activity.[4,5]

There is a paucity of research on the frequency physical therapy providers recommend healthy lifestyle changes to their patients or the confidence these providers have in their ability to perform this type of patient education. The author was unable to find any research that included SPTAs, with PTAs being a growing number of physical therapy providers.

Researchers have reported that 98 to 100 percent of PTAs believe that health promotion is fundamental to their occupation.[5,10-12] This included providing advice on non-treatment related physical activity as well as the belief that physical therapy providers should promote healthy behavior changes such as increasing physical activity levels to prevent chronic diseases.[5,10-12] It remains unknown whether there is a correlation between PTAs' and SPTAs' personal health behaviors and the health recommendations made to their patients.[5,10-12] The purpose of this study is to examine how SPTAs' personal health habits and perception of role modeling influence the students' expectations for recommending healthy lifestyle changes to patients.

## Literature Review

### Introduction

There is ample evidence clearly demonstrating that a healthy lifestyle, including participation in regular physical activity, managing stress, eating a proper diet, having

proper sleep habits, and decreasing the use and abuse of nicotine and alcohol is essential to maintaining health and quality of life. [1-5,12-21] These personal health behaviors, particularly poor diet and lack of physical activity, clearly contribute to the increasing numbers of people who are overweight and obese, which in turn contributes to costly chronic health conditions and higher morbidity and mortality.[20,22-26] The United States (US) Centers for Disease Control and Prevention (CDC) lists physical activity as the first indicator of health because physical activity provides the greatest improvement to an individual's health and wellness when compared to all other medical interventions.[14,20]

Researchers have found the performance of regular physical activity correlates with a reduction in all-cause mortality for both genders by as much as 20-45 percent.[4,20,27,28] Due to this, physical activity is the single most significant modifiable risk factor for mortality and morbidity. [2,4,5,8,14,19,24,27,28] Participating in appropriate levels of physical activity can decrease the impact and risk of cardiovascular disease,[4,5,12,14,19,21,24,27] cerebrovascular accident,[12,14] diabetes mellitus,[5,12,19,21,24,27,28] obesity,[4,5,12,21,27] depression,[4,5,27] vertebral and hip fractures, osteoporosis,[14,19,21,27] some cancers such as colon and breast,[4,5,12,27,28] as well as other cardiopulmonary, bone, and joint disorders.[5,14,19,24] The US Surgeon General, the American College of Sport Medicine (ACSM), the American Heart Association (AHA), and the World Health Organization (WHO) all recommend at least 30 minutes of moderate intensity physical activity five times a week.[4,14,19,21,27] The ACSM, AHA, and WHO alternately recommend between 60 to 75 minutes of weekly vigorous physical activity and acknowledge that as little as ten minutes of any level of physical activity can be beneficial.[19,27]

Proper diet, including daily consumption of five servings of fruits and vegetables,

and avoiding the use of tobacco products are also strongly correlated with maintaining physical health.[16,21,22,28] A diet low in fat and high in whole grains, fruits and vegetables has been shown to reduce all-cause mortality by as much as 75 percent and cancer mortality by approximately 35 percent.[16,22] Despite this evidence, it is estimated that at least 23 percent of US adults do not eat the recommended number of servings of fruits and vegetables and between 25 to 29 percent of the US population aged 25–44 years old use tobacco products.[21,22,29]

Information regarding the need to implement healthy behaviors is readily available to the US population. However, despite the clear evidence that poor health habits negatively affect overall health, altering health behavior has proven difficult. The CDC estimates that in 2012, 35.7 percent of US adults and 17 percent of children were obese.[30] These high percentages do not include the number of US citizens who are overweight. Other studies estimate at least 50 percent of US adults do not engage in recommended levels of physical activity.[15,22] These statistics are even worse when considering males alone.[22] The correlation of poor health habits with costly medical conditions is especially important in the US, which has the highest per capita spending on healthcare in the world but ranks only 31$^{st}$ in life expectancy.[16,22]

**Healthcare Professionals and Counseling Patients on Healthy Behaviors**

Because healthy behaviors impact overall health and wellness, morbidity and mortality, healthcare providers generally agree that there is a professional responsibility to use the patient-provider relationship as a foundation to provide regular guidance on improving health behaviors.[12-14,17,24,31] These behaviors include increasing physical

activity,[5,12-14,17,24,28,31] improving diet,[12,28,31] weight loss,[14,24] reducing stress or improving emotional health,[12,31] and decreasing or ceasing the use of tobacco [12,24,28,31] and alcohol.[12,24,31] Some researchers have asserted the benefits of a healthy lifestyle are so substantial that an ethical obligation exists for all healthcare providers to provide patient education and guidance on healthy lifestyle modification.[2,15,19,20,25,28]

Positive lifestyle changes with reduction in costly and preventable morbidity and mortality have been associated with healthcare providers offering preventive counseling and patient education on implementing health behavior modification. Much of this research has focused on primary care, or general practice physicians.[2,13,20,24,31-33] In one study, six months after receiving physician advice and written educational materials on proper diet and exercise, patients maintained increased levels of physical activity that caused a reduction in morbidity and mortality of approximately 25 percent.[20] Other researchers have concluded that increasing patient education resulted in increased patient effort and likelihood of improvement in diet, smoking cessation, decreasing alcohol consumption, and increasing physical exercise.[6,24,25,31,34] Even brief counseling has been shown to improve cessation of nicotine and decrease alcohol abuse.[7,35]

Patient compliance with health prevention and treatment programs has been shown to improve with healthcare provider counseling on health behavior modification.[7,31,34,36, 37] Patient success with compliance was achieved in 64 percent of patients when knowledge was provided alone, 85 percent when behavioral strategies were employed, and 88 percent when a combination was used.[31] The likelihood of health behavior change is further improved by utilizing a multidisciplinary approach with two or more healthcare providers offering advice on the benefits of a particular health behavior

change.[5,7] Assisting patients in identifying health behaviors that can be changed, setting and modifying achievable goals, increasing patients' self-efficacy and the ability to problem solve, and identifying positive social support are known to improve success with healthy behavior changes.[31]

**Health Behavior Change Theories**

The Transtheoretical Model of Behavior Change Theory has been used to describe the reasons individuals change their health behaviors. The theory proposes that an individual passes through a series of stages of readiness in order to implement a change of personal health behavior. The five stages change identified in the model are: (1) Precontemplation when no change is considered, (2) Contemplation when change is considered, (3) Preparation when steps are taken in order to effect a change, (4) Action when a change is initially implemented, and (5) Maintenance when the change has been incorporated for more than six months. Patient education and counseling can be tailored during each stage in order to most effectively support the patient in implementing successful changes.[8,36] This model has also been validated to identify the stage a healthcare provider is within in regards to providing health behavior counseling to patients. Studies have found that as practitioners advance to higher stages in the Transtheoretical Model of Behavior Change Theory for both providing patient health education and their own personal health behaviors, there is a decrease in perceived barriers to providing patients with health promotion education.[8]

Researchers have also used the Social Cognitive Theory (SCT), also known as the Stages of Change Model, to explain the process required to implement health behavior

changes. This theory incorporates a series of psychosocial factors, suggesting that a person, their behavior and their environment are influenced by the belief that a goal can be achieved, the amount of personal self-efficacy, and confidence that a specific task will result in the desired outcome. Behaviors performed more frequently result in higher self-efficacy and lead to increased performance of that behavior. Further, external reinforcement, particularly the observation of role-modeling, can either positively or negatively impact any of the psychosocial factors. The observation of another person successfully performing a health behavior or implementing a change can lead to higher self-efficacy in personally implementing that change. The higher a person's self-efficacy and outcome expectation, the more likely a change will occur and result in higher personal satisfaction. Researchers have supported the use of SCT, revealing that patients place more confidence in medical advice when it is given by a provider who role models healthy behaviors.[15,16,32] Also, the more frequently a healthcare provider performs health behavior counseling, the higher the reported health behavior counseling self-efficacy.[15,16,32]

Social Learning Theory encompasses many of the concepts of SCT but focuses on how many behaviors are learned by observing the interaction of individuals within one's personal environment. This theory places great importance on healthcare provider role modeling positive health behaviors. Several studies have supported this theory, showing that when physicians, nurses, medical students, or medical clinical support staff receive education about improving their personal health habits, there are positive changes in the amount of health behavior counseling provided to patients, self-efficacy, and confidence that that patients' benefit from the counseling. Healthcare educators may play an essential

role in role modeling healthy behaviors for their students, the next generation of healthcare providers, who in turn may influence their patient behaviors.[30,34]

**Healthcare Provider Training and Ability to Provide Counseling on Health Behaviors**

Healthcare providers receive education regarding the benefits of healthy behaviors, which places these providers in a position to influence patients' attitudes and behaviors.[19,21,31] In a national survey of health education faculty, 93.5 percent of faculty agreed that health promotion and disease prevention were very important or somewhat important to their program goals.[15] Despite faculty beliefs, many healthcare providers may require further training and expertise to develop the counseling skills. Effective counseling requires that healthcare providers have communication and relationship building training to deliver the counseling at the appropriate time and in the appropriate manner and language with empathy, respect, and unconditional positive support. Providers may also require training to be able to gather, review, and interpret the most current research and prevalent lay information so that advice on health behavior modification can be given to patients in lay terms.[31] These skills can help patients identify health behaviors that could be improved and develop patient self-efficacy to act on the counseling in order to effect behavioral change.

Researchers have also examined the effect of education provided to physicians and medical students in areas such as improving personal health behaviors for diet, exercise, and the use of alcohol and tobacco. After workshops and training on behavior change counseling, these providers reported improvement in personal health behaviors,

perception of the relevance of providing patient counseling, and self-efficacy with providing health behavior education to patients. The reported increase in patient counseling, empathy, and comfort with sharing their personal health information with patients was also correlated with an increase in the amount of health behavior education received.[6,29,33,36,37] Interestingly, medical students have a greater belief that preventive counseling can positively affect patient behaviors as compared to practicing physicians. Unfortunately, this belief was shown to be less in fifth year medical students when compared to first year students.[33]

Receiving encouragement to perform more patient education has been identified as another factor directly associated with increased patient health promotion counseling. Nurses, nurse midwives, physician assistants, and other non-physician providers have been shown to have increased self-efficacy after receiving only encouragement to perform more health promotion patient education. [31] Multiple research studies have concluded that after physicians, dentists, dental hygienists, nurses, and pharmacists were encouraged to increase smoking cessation education with their patients, higher numbers of patients successfully decreased tobacco use.[7,22] In one study, health promotion education was provided to both medical providers and support staff. After the training, the providers and staff were almost 40 percent more likely to be physically active, and 30 percent more likely to report being "very comfortable" counseling patients on increasing physical activity.[34] These providers and staff were also 25 percent more likely to feel physical activity was an important part of their workplaces, 20 percent more likely to report their personal health habits were an example to their patients, and almost three times more likely to feel their workplace supported healthy food options.[34]

Multiple studies have shown that the more frequently healthcare providers perform health behavior counseling in clinical practice, the higher providers rate their self-efficacy in providing this education. Increased frequency of health behavior counseling is also associated with higher expectations of positive patient outcomes. This positive correlation between self-efficacy and promoting specific health behaviors has also been seen in studies involving PTs.[12,15,31] The greatest predictor of a PT providing health counseling is the PT's educational background.

On a daily basis during patient care, healthcare providers are regularly faced with the negative health effects of a sedentary lifestyle and the need for increased health promotion counseling during daily patient care.[13,16,22,25,32] Primary care providers and other healthcare professionals who have regular contact with patients over an extended period of time are ideally positioned to affect health behavior changes. Because of the frequent interaction and ability to observe the patient over extended periods of time, these providers may help patients identify risk factors at an early stage before significant negative health effects occur. The regular contact these providers have with their patients also allows for follow-up on initial health behavior counseling and the opportunity to offer continued feedback and advice.[2-5,20,24 28,39]

PTs and PTAs have extended personalized interaction with patients during multiple, frequent visits.[7,13,22,35] In addition, the universal goal of physical therapy is to identify movement deficits, assess potential, maximize function, and improve health related quality of life.[10,13,14,17,19] To achieve this goal, providing patient education and health behavior counseling is a critical part of physical therapy intervention.[10,13,14,17,19] This education helps patients to modify their behaviors to eliminate performance of

aggravating activities and to engage in prescribed exercises and physical activities that promote neuromusculoskeletal recovery.[10,13,14,17,19] The skills PTs and PTAs need to improve neuromusculoskeletal related health behaviors are the same skills needed to improve overall health behaviors that can prevent disease and promote health.[5,7,13,14,16,18]

Some researchers have concluded that PTs and PTAs provide some form of healthy behavior education in 50 percent of physical therapy visits, with each visit containing an average of 2.44 health promotion statements.[8,15,16] Topics include: improving physical and leisure-time activity for the patient and their family, smoking cessation, using or establishing personal support systems, reducing risk of secondary complications, accessing available resources, and reducing risk of recurrence of the condition for which the patient is receiving physical therapy. Several studies have found that the PTs' statements focused primarily on a patient's chief complaint.[8,15,16] In the 2004 study by Rea, et al., 54 percent of health promotion statements provided by PTs and PTAs involved increasing physical activity and 41 percent involved improving psychological well-being.[16] Statements regarding smoking cessation were addressed 17 percent of the time and statements regarding managing weight and nutrition were addressed in 19 percent of the statements.[16] In the 2014 study by Fink et al., PTs reported confidence in their abilities to provide patient education with 85 percent reporting confidence on the topic of improving physical activity, 71.8 percent on nutrition and overweight issues, 69 percent on improving psychological well being, and 63.7 percent on smoking cessation.[15]

PTs and PTAs also have frequent contact with individuals with disabilities and patients who have sustained a recent illness or injury; populations known to have lower

physical activity and higher incidence of obesity compared to the general population.[8,10,12,14,16,32] These individuals would particularly benefit from education and guidance on healthy lifestyle changes, including increased physical activity.[8,10,12,14,16,32] PTs and PTAs are in an ideal position to promote healthy behaviors in a cost effective manner in order to prevent and treat chronic diseases in both those with and without health conditions. These rehabilitation providers regularly focus on altering patient behaviors, have the expertise in prescribing safe physical activity for ill, injured, and fragile populations, and maintain the belief that health promotion is integral to providing appropriate physical therapy patient care.[10-14,16,17,19,32] Due to the increased need for health and wellness promotion for all US citizens, there may be an increased need to emphasize this topic during the education of SPTAs.[20,33,37,38] Because provider personal health habits are associated with the amount patient healthy behavior education provided, this study attempts to fill the gap in literature as there is no current research on the personal health behaviors of SPTAs or their perception of role modeling to patients.

**Amount and Effectiveness of Health Behavior Counseling**

The majority of research on the amount of patient education and counseling on health behavior modification has been focused on primary care and general practice physicians. The counseling appears to be sporadic, minimal, and infrequent during normal physician visits.[5,13,28,31] Most patients report receiving information on healthy lifestyle modification as a high priority during a visit with a healthcare provider. However, less than 25 percent of patients reported receiving smoking cessation advice, and only approximately 30 percent reported receiving advice on increasing physical

activity.[28] In several studies, only 30 to 40 percent of obese individuals reported receiving counseling on weight loss, diet, and exercise from their physician.[2,20,28,31] Patient surveys and the examination of patient encounter records revealed individuals with disabilities received less counseling on healthy lifestyle changes from providers and are recommended fewer preventive treatments.[1]

Numerous studies have established an association between healthcare providers' personal health behaviors and an increased rate of patient counseling on the topics of improving physical activity, decreasing dietary fat intake, using sunscreen, obtaining mammography, smoking cessation, and decreasing the use of alcohol. [6,8,13,16,17,20,22,25,26,28,33-36,38,40] If a provider currently performs a specific health behavior, the provider reports higher self-efficacy, stronger belief of receiving proper training to counsel patients on the topic, and less difficulty providing healthy lifestyle modification counseling for that health behavior.[6,22,28,34] Physicians who consume lower fat diets and higher amounts of fruits and vegetables educate their patients to improve their diets. Those with lower Body Mass Index (BMI) provide more patient counseling regarding weight loss and exercising. Those who do not smoke counsel more on smoking cessation. Those who consume little or no alcohol counsel more on reducing alcohol consumption.[26,28,33,34,39] Patients of providers who personally participate in recommended preventive care measures such as vaccinations and screenings are significantly more likely to obtain these recommended measures. Female physicians who do not regularly perform self breast examinations, have mammograms, or receive Pap smears provide these services to their patients at the same rate as male physicians, much less frequently than female physicians who engage in these preventive services.[26,28,40]

Healthcare providers who perceive themselves as healthy also demonstrate increased likelihood of providing preventive screening and counseling, with the amount of counseling further increasing if the provider is attempting to improve that specific health behavior.[6,28,34,36,38] It has been postulated that providers who have changed a personal health behavior may view the change as more achievable for their patients.[24] Even when a provider is simply encouraged to improve their own personal health behaviors, the amount of health behavior patient education and counseling provided increases.[6]

Counseling to decrease the use of tobacco products can improve not only the health of the patient, but also individuals who are exposed to secondhand smoke, which is especially important for infants and children. Of note is that smoking rates are higher in individuals with disability, the very population that receives the least counseling.[1] Some research has demonstrated smokers have a 44 percent reduction in years of healthy life compared to those who have never smoked.[7] Known smokers do not receive smoking cessation counseling at almost 80 percent of their ambulatory care physician appointments despite evidence correlating cessation of smoking with even brief healthcare provider counseling.[7] Frequently, PTs treat patients who transition from an acute care setting where patients have had a period of forced smoking cessation. This allows physical therapy providers an excellent opportunity to capitalize on extending the period of abstinence and progressing towards successful complete cessation. Evidence suggests that the effects of withdrawal from tobacco products including cravings, negative mood changes, weight gain, and insomnia can be lessened by exercise interventions provided by PTs.[7]

The relationship between PTs' and PTAs' health behaviors and patient counseling has had little research. Several studies suggest that PTs, in a manner similar to physicians, are more likely to discuss the benefits of increased physical activity and healthy behaviors with their patients when they participate in healthy behaviors. PTs who exercise are more likely to discuss exercise with their patients and believe that wellness counseling is important.[8,16] Physical therapy providers were most likely to provide education on healthy behaviors when assisting patients with increasing physical activity (54%), improving psychological well being (41%), assisting with weight loss (19%), or counseling for smoking cessation (17%).[15] The amount of health behavior education was not correlated with treatment location within the US, treatment session duration, physical therapy setting, how far along the patient was in the course of recovery, or the PTs' degree level or years of experience.[15]

**Healthcare Provider Personal Health Habits and Factors Affecting Counseling Practices**

Due to the strong tie between personal physician health habits and counseling practices, the health habits of other healthcare providers, including PTAs and SPTAs, need to be determined. In general, healthcare providers have been shown to maintain healthier lifestyles compared to the US population, living longer than sex and age matched groups, including when compared to other graduate educated professionals or groups with high socioeconomic status.[19,23,26,28,33,41] Only a few studies have explored the personal health behaviors of physical therapy providers, particularly in the last ten years. The performance of physical activity, non-smoking, eating fruits and vegetables, and

maintaining healthy weight were studied either individually or in combination with one study focusing solely on PTs, one on PTs and PTAs, and two PTs, PTAs, and SPTs. All have concluded that physical therapy providers maintain better health habits when compared to the general population as well as other healthcare providers.[8,16,17,22]

A BMI between 18.5 and 24.9 is considered healthy weight.[42] Several studies have found that approximately 80 percent PTs and SPTs maintain a healthy weight with 96 percent reporting the belief that PTs are responsible to promote this behavior.[11,16,22] Male PTs, however, were less likely to maintain healthy weight and 44% less likely than female PTs to report it is important for PTs to role model healthy weight.[22] In contrast, between 29 and 56 percent of health and fitness professionals are overweight.[22] In a 2008 study by Groth, et al, the percent of female and male athletic trainers maintaining healthy weight was found to be 53 percent and 26 percent respectively with a mean BMI of 25.78 for the females and 27.97 for the males.[21] In a 2012 study by Biernat, et al, normal BMI was maintained by only 39.8 percent of male physicians, 65.0 percent of female physicians, 53.3 percent of female nurses, 46.3 percent of other male medical personnel, and 61.5 percent of other female medical personnel.[43]

A few studies focusing on healthcare students have revealed a tendency for SPTs to be healthier than students entering other health professions, with lower likelihood of being overweight or obese and reporting that physical activity was an important part of their daily lives.[19,23] One study showed that students in several different medical disciplines had healthy weight mean BMI. Medical students had the highest BMI (23.75), followed by SPTs (22.10), nursing students (21.26), pharmacy students (21.27), midwifery students (20.69), and cosmetology students (20.37).[19] Another study found

that SPTs and sport education students had similar BMI.[27] Despite these mean healthy weight BMI, approximately 20 percent of students enrolled in health-related majors were found to be overweight or obese compared to nearly 40 percent of students in non-health majors.[23]

Consuming proper diet is a struggle for much of the US population, including healthcare providers. More than 70 percent of PTs and SPTs report eating a balanced diet, more than 60 percent eating the recommended servings of fruits and vegetables, and only approximately 3 percent reporting eating fast food very often or often.[16,22] Again, male PTs had lower health behaviors compared to female PTs and were 37 percent less likely to eat the recommended serving of fruits and vegetables, feel that it is important do so personally, and to recommend to this behavior to patients.[22] In contrast, athletic trainers have been found to consume an average of only nine servings of fruits and vegetables weekly.[21] Studies on students in health majors revealed an average of almost one more daily serving of fruits and vegetables compared to students in non-health majors. [23] However, only 35 percent of students in health majors were shown to eat five or more servings of fruits and vegetables daily compared to less than 15 percent of students in non-health majors.[23]

Many studies have revealed that healthcare providers use tobacco products and alcohol at much lower rates compared to the general population. In the few studies performed, well over 90 percent of PTs and more than 85 percent of SPTs were non-smokers, lower than any other healthcare professional.[10,16,22,38] Furthermore, between 65 to more than 80 percent of PTs and SPTs have never smoked.[10,16,22,38] In contrast, many studies have shown that between 4 and 7.8 percent of physicians smoke which is lower

than the 14 and 27 percent of medical students who use tobacco products.[26,29] Among athletic trainers, only one percent are smokers with 92 percent reporting that they have never smoked.[21] A study by Kanwendo in 2000 revealed that 82 percent of student occupational therapists (SOTs) did not smoke with nearly 70 percent having never smoked and 74.2 percent nursing students did not smoke with 56.7 percent never having smoked.[38]

Approximately 90 percent of the general US population report consuming alcohol and 35 percent drink daily, the same rate of drinking reported by physicians.[21] Similarly, 11 percent of athletic trainers reported being non-drinkers.[21] In contrast, PTs have been shown to consume alcohol at a much lower rate with more than 55 percent being ex-drinkers or non-drinkers.[10,16] Additionally, only four percent of athletic trainers and one percent of PTs consumed more alcohol than the CDC recommended guidelines of one drink per day for women and two drinks per day for men, with more than 80 percent of PTs consuming less than three alcoholic beverages a week.[16,21]

Studies on the physical activity levels of physicians reveal between approximately 50 to 70 percent of physicians participate in regular physical exercise.[2,43,44] Other studies have also revealed moderate to high levels of physical activity are performed by 60.6 percent of female nurses; 62.3 percent of male medical personnel, and 53.5 percent of female medical personnel.[43] Several studies have concluded that approximately 80 percent of PTs are performing or increasing regular physical activity.[8,22] In 2010, Chevan and Haskvitz found between 63.8 and 72.4 percent of PTs, PTAs, and SPTs performed physical activity at recommended levels.[17] A 2014 study by Fink found that 90.2 percent of PTs and SPTs reported being somewhat or highly active but also 54.2 percent of SPTs

and 29.5 percent of PTs reported not meeting recommended exercise guidelines.[16]

In a study comparing female SOTs, SPTs, and student nurses, approximately 80 percent of SPTs performed regular physical exercise at least twice a week, followed by nearly 60 percent SOTs, and approximately 45 percent of nursing students.[28] In a 2013 study of students at a medical university in Poland, all SPTs were moderate or highly active while students of other healthcare disciplines also performed moderate and high physical activity at rates higher than the general population (pharmacy students 96 percent, nursing students 94 percent, midwifery students 88 percent, cosmetology student 86 percent, medical students 74 percent).[19] Interestingly, all disciplines had significantly lower perceptions of achieving recommended guidelines compared to the number who actually adhered to the guidelines. SPTs had the greatest discrepancy with only 62 percent perceiving themselves as meeting recommended guidelines despite doing so.[19] This may indicate physical therapy providers have a tendency to underestimate their own activity levels.[19] While these studies are promising, overall the research shows less than 20 percent of nursing students meet recommended physical activity guidelines.[21] Excluding nursing students, only approximately 25 percent of other healthcare students meet the recommended guidelines.[21]

Higher educational attainment has been associated with higher levels of physical activity, but this does not explain why PTs and SPTs generally participate in physical activity at rates higher than other healthcare professionals.[17] It is unclear whether individuals with better health behaviors self-select into the physical therapy profession or health behaviors improve during the course of education and training. [17,19,22,38] Regardless, the goal of education is to generate highly skilled healthcare professionals

prepared to competently provide patient care. Because provider personal health behaviors are so closely tied to their patient counseling purposes, the health behaviors of SPTs and SPTAs can be an indicator of the future patient care practices of the profession. Providing SPTs and SPTAs education on and encouraging personal adoption of proper health habits, including physical activity levels, may help promote best patient care outcomes.[17,20,22,23,33,45,46]

Researchers have also examined the relationship between the amount of health behavior counseling performed and a provider's age and gender. Female physicians and nurse practitioners, especially those aged 45 to 64 years old, and PTs over the age of 40 years old were found to be more likely to provide patient education and counseling on the importance of health behavior modification.[8,16,39] Female physicians were also more likely to provide physical activity counseling and to spend more time on health behavior counseling compared to male physicians. They were more likely to consume low fat diets, be attempting weight loss, consume little alcohol, use sunscreen, and not smoke.[25,39] In one study, female PTs were more likely to provide health behavior counseling about the importance of maintaining healthy weight and proper diet when compared to their male counterparts. The percentage of male PTs maintaining a healthy weight and eating a well-balanced diet was lower than female PTs, with only 37% eating the recommended amount of fruits and vegetables.[22] These male PTs were also more likely to state these behaviors were not important for them personally or to recommend to their patients.[22]

**Healthcare Provider Role Modeling of Healthy Behaviors**

Healthcare professionals have been shown to have increased patient credibility when they role model healthy personal behaviors, including physical exercise. Doing so avoids conflicting messages between the advice a provider gives to a patient and what the patient sees the provider doing.[19,28,33,38,41] It is postulated that observing another person role modeling a behavior improves learning and may increase patient motivation to successfully adopt the behavior.[16,38] Disclosure of a provider's own personal health habits and risk factors affects patient counseling on healthy lifestyle modifications. The more information about personal health habits a provider discloses, the higher likelihood that a provider will counsel patients on behavior modification and patients will be willing to reveal more details of their own health habits.[25,35,39] Many healthcare providers and fitness professionals report that they should role model proper weight and health behaviors for their patients, a belief correlated with increased patient counseling to improve health habits.[21,25,30,39] This has been found to be particularly true for PTs and SPTs who consistently report a strong belief that physical therapy professionals have a responsibility to role model healthy behaviors in order to practice what they preach.[10,22,45] One study found that more than 90 percent of PTs and SPTs agreed that it is very important that physical therapy professionals role model healthy behaviors, including maintaining a healthy weight, following CDC guidelines for physical activity, and not smoking.[22]

Previous authors have demonstrated that patients view health care providers as a credible source of information regarding health and wellness.[2-5,20,24,28] It is of significant import that patients have been shown to view providers who maintain healthy weight and perform physical exercise as more trustworthy and more credible for health behavior

modification counseling.[3,20-22] When being treated by physicians of normal body weight, patients were also more likely to have confidence in all medical advice received for any condition and to follow the physician's recommendations. [3,25] Patient compliance with physical activity recommendations has been shown to decrease when the recommendations are made by a healthcare provider who is overweight or has poor physical fitness.[18,45] When a healthcare provider role modeled healthy behaviors, including physical exercise, patients reported being more open to health behavior counseling and having higher motivation to change their health behavior.[6,16,17,22,26,28,31,33,35,41] Several studies have shown that when patients were told their physicians had healthy diets and exercised or the personal health behaviors of the physicians were disclosed, patients reported increased motivation to effect their own personal behavior changes. [6,16,22,26,28,34,35]

**Barriers to Providing Health Behavior Counseling**

Prior research has revealed several significant barriers to healthcare workers providing patients with health behavior modification education. The most frequently cited barriers are lack of time, reimbursement, and lack of awareness of supplemental materials that can be given to patients.[6-8,20,24,31] Lower patient socioeconomic status has also been seen as decreasing compliance with behavior changes, as well as socioeconomic and ethnic disparities between the provider and patient.[24,34] Several studies have found that many healthcare providers, including PTs, hold the belief that ultimately the patient is responsible for their lifestyle and health behavior choices. This can lower the amount of health behavior education provided because it reinforces the

perceived barrier that patients do not desire to receive such education.[12,24] Past research has concluded that patient recall of specific medical advice on weight loss, diet, and exercise provided during an encounter with a healthcare provider can be as low as 30 percent and providing written information improves compliance.[20,31] These barriers are serious concerns that will need to be addressed if the United States is to be successful in moving towards a more cost efficient preventive care model.[20]

Traditionally, healthcare education has focused on treatments provided to patients after an illness or injury occurs, not preventive health and wellness behavior modification, with most patient-provider interactions focused on an acute care diagnosis or a specific health problem. Some providers report the belief that health promotion is the responsibility of other professionals and patients themselves.[24] Providers reported difficulty discussing preventive care measures and reluctance to discuss health behaviors with patients, particularly in regards to weight.[20,34] Providers frequently cite a lack of confidence, self-efficacy, experience, and training on counseling strategies to influence behavior change as barriers to providing health behavior counseling.[20,24,31,34] Providers also report lack of patient belief that a change needs to be made, poor patient motivation, and a limited patient support system as barriers to patient implementation of provider advice regarding modifying health behaviors.[8,22,24,31] The belief that health behavior modification counseling will have poor outcomes because of patient resistance to or non-compliance with recommendations is another barrier to providing health education counseling, as reported by providers.[7,8,20,31] Lower self-efficacy in counseling patients on health behaviors also has been found to be correlated with lower outcome expectations.[31] Researchers have reported that providers stop performing preventive health behavior

counseling if they believe a patient does not want to implement change or discuss personal health behaviors.[24]

There is little research on barriers to health promotion within the profession of physical therapy. From the available data however, it appears PTs generally report having more time to counsel patients on health behavior changes. Interestingly, despite reporting more time with patients, some PTs identified a lack of time for discussing health behaviors. The primary limitation PTs reported was insurance limitations on the number of physical therapy visits, the length of each visit, and overall reimbursement. The outcomes of previous studies indicate the greatest limiting or facilitating factor in a patient adopting a health behavior is patient interest in changing the behavior.[7,8,11,13,15] Traditionally physical therapy has been assigned a secondary or tertiary role in patient care because patients are generally referred after an illness or injury has created a loss of function, creating situations where incorporating preventive health promotion education may not be appropriate for the primary diagnosis. Reimbursement also frequently limits the amount of preventive care and treatment PTs are trained to provide, limiting the physical therapy scope of practice. Because patients are referred to physical therapy for specific neuromusculoskeletal disorders, PTs report patient expectations, motivation, and goals for physical therapy often do not include lifestyle modifications.[8,11,13,32]

**Introduction Conclusion**

There is a clear relationship between a healthcare provider's personal health behaviors and health education and counseling provided to patients.[6,8,13,16,17,20,22,25,26,28,33-6,38-40] Maintaining healthy weight and physical fitness is also associated with increased

patient compliance with a provider's recommendations, including implementing healthy lifestyle modifications.[3,20,22] Personal health behaviors of physical therapy providers impact the expected amount of healthy lifestyle education provided to patients and offer insight into one facet that affects patient compliance. Furthermore, as education has been linked closely to patient counseling on improving healthy behaviors, it is in the best interest of the physical therapy profession to ensure educational curricula include the importance of providing patient health education and to encourage all physical therapy providers to maintain positive, healthy lifestyles and appropriate weight.[18,45]

However, the personal health behaviors of physical therapy providers remain largely unknown as there have been few studies performed in the last decade. The few that have been performed focused primarily on PTs or SPTs and reported health behaviors such as daily physical activity levels, diet, body weight, nicotine use, sleep habits, beliefs regarding role modeling, and amount of health behavior modification education provided to patients.[8,16,17,19,22,23] No research on SPTAs' health behaviors or their perceptions of role modeling were found in the current literature.

**Purpose**

The purpose of this study was to explore the relationship between SPTA: (1) personal health behaviors, (2) perceptions of role modeling to patients, and (3) expectations for recommending healthy lifestyle changes to future patients. The two null hypotheses investigated in this study were as follows: (1) there would be no relationship between SPTA personal health behaviors and expectations for recommending healthy lifestyle changes to future patients, and (2) there would be no correlation between SPTA

personal health behaviors and the perception of role modeling to patients. With increasing numbers of PTAs working as integral components of the physical therapy profession, PTAs have a greater opportunity to provide this education to physical therapy patients. Establishing SPTA health behavior practices and beliefs can offer insight into the probable personal behaviors and health counseling practices of these future physical therapy providers and may be useful in identifying areas of educational need and opportunities for improved patient care.

## METHODS

The Institutional Review Board of the University of Indianapolis approved both the trial and current study protocols. Each participant was provided informed consent to take part in this study. A literature review was conducted using internet databases: CINAHL Plus with Full Text, EBSCOhost, PubMed, MEDLINE (PubMed), SportDiscuss with Full Text, and GALE Nursing and Allied Health Collection. Keywords to obtain data in the search included physical therapy, physical therapist, health, health education, patient, provider, health behavior, health promotion, healthcare provider, self reported, and fitness.

### Study Design

This study employed a cross-sectional survey study research design. Participation was voluntary with no incentive to participate and all responses were anonymous. Questionnaires with incomplete data were excluded from data analysis, as described by Fink et al. in 2014.[16]

### Participants

A convenience sample was obtained via a request for participation distributed to educators at PTA programs via the American Physical Therapy Association (APTA) Education Section listserv as well as posted on the PTA Educators Facebook page. The APTA listserv is open to APTA Education Section members. The PTA Educators Facebook page is available to all interested individuals. Neither of these sites maintains a list of the total number of schools that are represented by the members.

Those PTA educators willing to forward a recruitment email that included an internet hyperlink to their students were asked to contact the researcher, indicating the total number of students in their program who would be receiving the recruitment email. A list of all participating educators as well as the institutions and PTA programs they represented was compiled. In three cases, two educators from the same institution and PTA program responded to the request. Email correspondence was conducted with these educators, verifying they were from the same institution and PTA program for an accurate count of participants recruited to participate. In each case, both educators in question responded to the email and correspondence was conducted with both educators. During the correspondence, the educators determined which of them would be responsible for disseminating this study's email with the link to the online questionnaire to their students. Inclusion criterion was only that the SPTA be currently enrolled in an accredited PTA program with an educator who agreed to participate in this study.

**Procedure**

The internet hyperlink to the research questionnaire was provided to a total of 1,127 SPTAs electronically via an email from the educator. The email asked the students to complete the questionnaires within 6 weeks. At the start of the questionnaires, the study was explained and informed consent was obtained to protect the rights of the human subjects. To ensure anonymity, demographic information was only used in aggregate and no internet protocol (IP) addresses were collected. Participants were advised in the informed consent of these procedures. Two weeks after the initial email had been forwarded to the SPTAs, a follow-up email also including the internet hyperlink

was sent to the PTA educators to forward to their students one final time. SPTAs that had not completed the questionnaire were reminded to fill out the survey. Those SPTAs who had completed the questionnaire were thanked for their time.

The research questionnaire included three separate questionnaires to measure the SPTAs' (1) expectations for recommending healthy lifestyle changes to patients, (2) role-modeling attitudes, and (3) personal health behaviors. The Expectation for Recommending Healthy Lifestyle Changes ("Expectation") questionnaire was developed via pilot study and expert panel review. The Part III: Role-Modeling Attitudes Survey ("RM") and Health Promoting Lifestyle Profile II (HPLPII) questionnaire were used in prior research and both have been shown to have good internal validity.[22,47,48] Each of these questionnaires will be discussed in detail in the next section.

To improve objectivity and trustworthiness of results, the order in which the three questionnaires would be organized in this research study was considered. Priming may occur when an individual is exposed to questions or concepts that may influence responses to subsequent questions.[50] It was determined that if a participant were to answer questions relating to the perception of the importance of role-modeling healthy behaviors and personal health behaviors, a priming effect may occur causing that participant's responses on the Expectation questionnaire to possibly become artificially inflated. Because of this, the Expectation questionnaire was placed first. Again considering possible priming effects, it was determined that placing the RM questionnaire second, after answering questions regarding expectations for recommending healthy lifestyle changes but not personal health behaviors, would minimize priming of respondents' answers. Research on the construct validity of the HPLPII has demonstrated

lack of significant correlation with social desirability bias, thus having decreased possibility of participant responses being skewed by answering the other questionnaires first so it was determined that placing the HPLPII last should not significantly bias the participants' responses.[47]

## Data and Instruments

Recommended ways to select and improve the development of questionnaires in research was reviewed and considered when selecting the three questionnaires to use in this study.[51] These included determining if (1) existing instruments with established reliability and validity testing were appropriate to answer the questions posed and (2) the instruments would be acceptable to the respondents, particularly the combined length of the questionnaires. Two existing questionnaires were determined to be appropriate for this study, with one questionnaire needing to be developed. To begin, the two existing instruments will be discussed.

### Health promoting lifestyle profile II (HPLPII)

The Health Promoting Lifestyle Profile II questionnaire was used to collect the quantitative personal health information data for this study (Appendix 1). This survey was selected as it directly assesses one of the constructs in this study's question, has been reviewed for validity and reliability in prior research, and has been used in a number of research studies to examine the personal health habits of adults in the general population,[58, 59] adult patients, [60, 61, 62] and healthcare providers.[63, 64]

The HPLPII is composed of 52 statements that measure the frequency of the

personal performance of healthy behaviors and perceptions of healthy behaviors using a 4-point Likert rating scale (never, sometimes, often, routinely). Responses to these statements provide a multi-faceted view into the participants' actions and perceptions related to maintaining or improving wellness, self-actualization, and overall fulfillment with one's life.[47]

The statements can be subdivided into six domains: health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management.

- Health responsibility includes statements regarding being accountable for one's own well-being including attention to personal health, self-education on health, and seeking professional healthcare.
- Physical activity includes statements regarding regular participation in physical exercise either as a regular fitness program or during daily activities.
- Nutrition includes statements regarding how well the participant searches out information on and is knowledgeable regarding the selection and consumption of healthy food in accordance with the United States Health and Human Services and United States Dietary Administration.
- Spiritual growth includes statements regarding practicing a balanced life leading to inner peace, having a sense of harmony and wholeness, and developing a meaning, purpose, and goals for life.
- Interpersonal relationships includes statements regarding the ability to develop close, intimate relationships by verbally and non-verbally sharing feelings.

- Stress management includes statements regarding both identifying and incorporating psychological and physical strategies to cope with tension. [47]

Prior research conducted used literature review and content experts to establish content validity of the HPLPII.[47] The construct validity of the HPLPII was determined to be r = .678 in comparison to the Personal Lifestyle Questionnaire.[47] Construct validity was strengthened by the lack of significant correlation with social desirability.[47] HPLPII internal consistency alpha coefficient was calculated as .943 for the total score with subscale scores ranging from .793 to .872.[47] A three week test-retest reliability coefficient for the HPLPII total score was calculated to be .982.[47]

**Role-modeling questionnaire (RM)**

To determine the importance SPTAs place on role modeling healthy behaviors to their patients, the RM questionnaire was used (Appendix 2). This instrument was selected as it directly assesses one of the constructs in this study's research question, has been reviewed for validity and reliability in prior research, and has been previously used with PTs, PTAs, and SPTs.[22,48] The RM questionnaire was originally developed by Cardinal, et al. for use with health, physical education, recreation, and dance (HPERD) professionals.[48] Participants are asked to use a five point Likert scale to rate how strongly they agree with each statement [Strongly disagree, Disagree, Neutral, Agree, Strongly agree].[22,48] The scale has been found to have a Cronbach α coefficient of 0.95. [48]

Black, et. al. 2012 modified the "Attitudes Towards Role-Modeling Survey" for use with PTs, PTAs, and SPTs.[22] The modifications made include a terminology change from "HPERD professionals" to "physical therapy providers," and specification of the

amount of physical activity necessary to meet CDC recommendations versus more general statements of performing physical activity “at a sufficient level."[22,48] In addition, the total number of questions were reduced from sixteen to ten. [22,48] Due to the modified questions specifying CDC recommendations, it was unnecessary to ask individual questions regarding resistance training, stretching, and aerobic fitness activities. Individual questions that discussed only future career opportunities, and fitness tests for graduation from HPERD programs and annually thereafter were also eliminated.[22,48] This modified version was used as the RM questionnaire in this study.

**Expectation questionnaire (Expectation)**

PTA perceived expectations for recommending healthy lifestyle changes to patients was measured using a self-developed questionnaire: Expectations for Working as a Physical Therapist Assistant (Appendix 3). No existing instrument could be found that assessed this construct. This instrument employs a five point Likert scale:

- Never (0% of the time when I could),
- Rarely (1-25% of the time when I could),
- Sometimes (26-50% of the time when I could),
- Often (51-75% of the time when I could),
- Routinely (76-100% of the time when I could).

Information gained from literature review helped guide the development of the questionnaire.[51] The questionnaire was fully developed with assistance from a panel of experts to determine what question topics would best meet the goals of this study and to avoid duplication of constructs. In addition, question content, readability, and clarity

were assessed with the wording of several questions edited and refined. The questionnaire was then piloted with a convenience sample of ten SPTAs for construct and face validity and reliability.

To minimize potential measurement error, questions were developed to be as specific as possible to decrease subjectivity with specific numbers being used whenever possible (i.e. specific ACSM and AHA recommendations for physical activity; CDC recommendations regarding diet, alcohol consumption, and sleep). In addition, expert review and pilot testing was performed. The results of a pilot study were examined to identify any problems with wording, reliability, or validity.

The finalized questionnaire containing seven questions was established based on the expert panel reaching a consensus agreement regarding revision recommendations. The questions focused on the amount of education the PTAs' felt they would provide their future patients on the topics of physical activity, healthy weight, diet, tobacco, alcohol, stress management, and sleep.

**Data Analysis**

All statistical analyses were performed using SPSS Statistics 24 (IBM Corp, 2016). Data was collected via the online questionnaire site, Qualtrics.com. Data was then checked for accuracy, coded and uploaded into SPSS. For each HPLPII domain, a sub-score mean was calculated as instructed by the HPLPII scoring instructions then the sub-scores were entered into SPSS. The data in SPSS was then compared to the data both in the Qualtrics website and the calculated HPLPII sub-scores to ensure accurate data entry. Descriptive statistics were calculated for the demographic data and the RM, Expectation,

and HPLPII questionnaires individually.

Cronbach's alpha (α) was performed on the Expectation questionnaire to establish internal consistency to determine the reliability of the questionnaire. Appropriate internal consistency was established with a Cronbach's α of 0.798. To determine the normal distribution of the data, a one sample chi-square test was run for all questions on the Expectation and RM questionnaires and a one sample Kolmogorov-Smirnov test was run for the HPLPII and its 6 sub-scores. The results of these tests determined that all questions demonstrated statistically significant differences in the observed and expected responses ($p<.001$). Due to the danger of collinearity between variables, correlations between each of the dependent variables were performed. No collinearity was found using a tolerance of $<0.2$ and variance inflation factor $>5$.

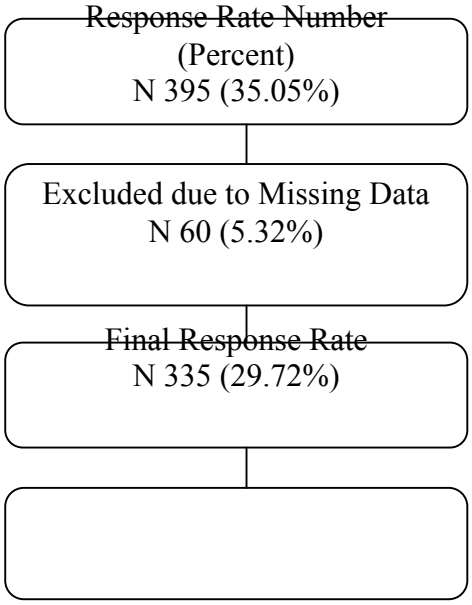
Correlation analysis and multivariate logistic regression was performed to examine relationships between the 3 questionnaires for potential correlations between personal health behaviors and self-efficacy for recommending health behavior changes to patients. These variables include SPTA personal performance of specific health behaviors such as participating in regular exercise, maintaining a healthy weight, and eating a healthy diet and expectations for recommending these behavior changes to patients.

## RESULTS

### Return Rate

PTA educators from a total of 35 PTA programs responded to the request. A total of 1,127 SPTAs received that recruitment email and hyperlink with 395 logging into the online questionnaire. Due to incomplete data, 60 participants were excluded from the data analysis resulting in a final response rate of 29.7% (n=335) (Figure 1). Prior research has shown that response rate improves when the researcher follows up with a reminder email, as performed in this study.[10, 21]

**Figure 1**




### Respondent Demographics

The demographic characteristics of the participants in the final sample are presented in Table 1. The majority of the final participants in this study were female (70.8%, n=238), between the ages of 18-35 years old (84.5%, n=282) and Caucasian (81.1%, n=273). Demographics for all enrolled SPTAs in 2013, the last year of available data, were reported by the Accreditation in Physical Therapy Education (CAPTE) as

66.7% female and 79.4% Caucasian, comparable to this study's participants who were 71.0% female and 81.6% Caucasian.[49]

| Table 1: Demographic Characteristics | |
|---|---|
| Sex | Total % (n) |
| Male | 28.9 (96) |
| Female | 70.8 (238) |
| Prefer Not to Respond | 0.4 (1) |
| Age (years old) | Total % (n) |
| 18-25 | 47.3 (160) |
| 26-35 | 37.0 (122) |
| 36-45 | 8.9 (31) |
| 46 and older | 5.8 (19) |
| Prefer Not to Respond | 0.7 (2) |
| Race | Total % (n) |
| Caucasian / White | 80.8 (273) |
| African American / Black | 5.6 (18) |
| Hispanic / Latino | 5.4 (18) |
| Asian / Pacific Islander | 1.5 (5) |
| Native American | 1.4 (4) |
| Other | 0.7 (2) |
| More Than One Race | 2.7 (9) |
| Prefer Not to Respond | 1.5 (5) |

**Central Tendencies**

Statistical analyses were performed for each questionnaire individually. Questions on the RM and Expectation questionnaires, as well as the overall HPLPII score and sub-scores for each domain, were calculated as mean scores.

The percentage of SPTAs who perceive they will provide patient education on each healthy lifestyle topic was calculated (Table 2). Most SPTAs perceived they will often or routinely educate their patients on meeting physical activity guidelines (76.4%, n=256), maintaining healthy weight (78.6%, n=263), decreasing or stopping the use of tobacco products (77.9%, n=261), performing stress management techniques (61.8%, n=207), and getting the recommended amount of sleep (65.3%, n=219). The topics with

the lowest percentage of SPTAs perceiving they will often or routinely provide patient education were eating a healthy diet (55.2%, n=185) and consuming no more than recommended amounts of alcohol (59.1%, n=198).

| **Table 2: Perceived Expectations of Recommending Healthy Lifestyle Changes** | |
|---|---|
| Provide Patient Education to: | % (n) of SPTAs Who Will Advise Often or Routinely |
| Meet daily physical activity guidelines | 76.4 (256) |
| Maintain healthy weight | 78.7 (263) |
| Eat healthy diet | 55.2 (185) |
| Decrease or stop the use of tobacco products | 77.9 (261) |
| Consume no > recommended amount of alcohol | 59.1 (198) |
| Perform stress management techniques | 61.8 (207) |
| Get recommended amount of sleep | 65.4 (219) |

The vast majority of SPTAs reported agreeing or strongly agreeing that it was important for physical therapy providers to perform and role model each healthy behavior except for the topic of eating five or more servings of fruit and vegetables a day (Table 3). Nearly all SPTAs agreed role modeling is a powerful teaching tool (95.5%, n=320) and that physical therapy professionals should practice what they preach (95.2%, n=319). More than 90% of SPTAs agreed or strongly agreed it is important for physical therapy professionals to perform and role model performing the CDC recommended amounts of physical activity (Perform: 92.2%, n=309; Role model: 91.9%, n=308), maintain healthy weight (Perform: 91.8%, n=308; Role model: 91.9%, n = 308), and abstain from smoking (Perform: 94.3%, n=314; Role model: 93.4%, n=312). The only topic with lower percentages of SPTAs agreeing or strongly agreeing was the importance of eating five or more servings of fruits and vegetables (74.6%, n=249) and role modeling this behavior (71.6%, n=240). This concurs with findings by Black et al 2012 who used the RM Questionnaire with PTs, PTAs, and SPTs (Table 4). [22]

| Table 3: Role Modeling Attitudes | |
|---|---|
| It is important for physical therapy professionals: | % (n) of SPTAs Who Agree or Strongly Agree |
| Role modeling is a powerful teaching tool | 95.5 (320) |
| To "practice what they preach" | 95.2 (319) |
| To be involved in CDC* recommended levels of regular physical activity | 92.2 (309) |
| To eat 5 or more servings of fruits and vegetables a day | 74.6 (249) |
| To maintain healthy weight | 91.9 (308) |
| To abstain from smoking | 94.3 (314) |
| To role model CDC* recommended levels of regular physical activity | 91.9 (308) |
| To role model nonsmoking behavior | 93.4 (312) |
| To role model eating 5 or more servings of fruits and vegetables a day | 71.6 (240) |
| To role model maintaining a healthy weight | 92.2 (308) |
| *CDC – Centers for Disease Control | |

| Table 4: Role Modeling Attitudes – Compared to Black et al. 2012 | | |
|---|---|---|
| It is important for physical therapy professionals: | % Who Agree or Strongly Agree | |
| | SPTA Results | Black et al, 2012 |
| Role modeling is a powerful teaching tool | 95.5 | 91.2 |
| To "practice what they preach" | 95.2 | 90.3 |
| To be involved in CDC* recommended levels of regular physical activity | 92.2 | 91.3 |
| To eat 5 or more servings of fruits and vegetables a day | 74.6 | 77.9 |
| To maintain healthy weight | 91.9 | 91.6 |
| To abstain from smoking | 94.3 | 92.1 |
| To role model CDC* recommended levels of regular physical activity | 91.9 | 87.6 |
| To role model nonsmoking behavior | 93.4 | 88.6 |
| To role model eating 5 or more servings of fruits and vegetables a day | 71.6 | 73.2 |
| To role model maintaining a healthy weight | 92.2 | 89.6 |
| *CDC – Centers for Disease Control | | |

Finally, the central tendencies of the HPLPII survey are displayed in Table 5. The 4-point Likert scale was scored as follows: 1 = Never, 2 = Rarely, 3 = Often, and 4 = Routinely. The HPLPII total score had a mean ($\bar{x}$) of 2.90 (SD 0.42). The subsections

with the highest scores (those closest to 4) were Spiritual Growth ($\bar{x}$ 3.29, SD 0.48) and Interpersonal Relations ($\bar{x}$ 3.20, SD 0.49), followed by Physical Activity ($\bar{x}$ 2.86, SD 0.63) and Nutrition ($\bar{x}$ 2.81, SD 0.53). SPTAs reported the lowest healthy personal behaviors in the subscores of Health Responsibility ($\bar{x}$ 2.55, SD 0.55) and Stress Management ($\bar{x}$ 2.65, SD 0.56).

**Table 5: Health Promoting Lifestyle Profile II (HPLPII)**

| Domain | Mean* | Variance | SD |
|---|---|---|---|
| HPLPII Total Score | 2.90 | 0.18 | 0.42 |
| Health Responsibility | 2.55 | 0.31 | 0.55 |
| Physical Activity | 2.86 | 0.39 | 0.63 |
| Nutrition | 2.81 | 0.28 | 0.53 |
| Spiritual Growth | 3.29 | 0.23 | 0.48 |
| Interpersonal Relations | 3.20 | 0.24 | 0.49 |
| Stress Management | 2.65 | 0.31 | 0.56 |
| *1 = Never, 2 = Rarely, 3 = Often, 4 = Routinely | | | |

**Correlation Analysis**

Correlation analysis was conducted to determine the strength and direction of associations that exist in the data. Goodman and Kruskal's gamma ($\gamma$) was chosen over Spearman's rho for the correlation statistics due to the fact that the data contain many correlations. Gamma correlations were performed between the SPTAs' responses on the Expectation questionnaire and their responses on the RM and HPLPII questionnaires (Appendix 4). All gamma correlations were positive with correlations noted for a variety of variables. Correlations above 0.4 were deemed strong and between 0.3-0.39 were deemed moderate. Results of the analysis for questions on the topics of: (1) physical activity and exercise, (2) weight, (3) diet and nutrition, and (4) tobacco use were reviewed in composite.

**Physical activity and exercise question analysis**

Both the first and second null hypotheses were rejected for questions relating to physical activity and exercise. Statistically significant correlations were found between all questions relating to the topic of physical activity and exercise ($p < .001$) including SPTA personal performance of physical activity and exercise, expectations for recommending healthy physical activity and exercise changes to future patients and the perception of role modeling to patients (Table 6). Educating patients on the importance of exercise was moderately correlated with perceived importance of performing regular physical exercise ($\gamma=0.39$), role modeling regular physical exercise ($\gamma=0.46$), and HPLPII physical activity subscore ($\gamma=0.42$). Strong correlations also were noted with the beliefs of role modeling being a powerful teaching tool ($\gamma=0.51$) and the importance of physical therapy providers practicing what they preach ($\gamma=0.45$).

The expectation of educating patients on the importance of physical activity was also correlated with other variables. A strong correlation was noted with role modeling abstaining from the use of using tobacco products ($\gamma=0.43$). Moderate correlations were noted with eating fruits and vegetables ($\gamma=0.32$), maintaining a healthy weight ($\gamma=0.34$), abstaining from the use of tobacco products ($\gamma=0.35$), role modeling eating fruits and vegetables ($\gamma=0.38$), role modeling maintaining healthy weight ($\gamma=0.39$), HPLPII total score ($\gamma=0.39$), HPLPII Nutrition sub-score ($\gamma=0.34$) and HPLPII Spiritual Growth sub-score ($\gamma=0.31$).

| Table 6: Physical Activity and Exercise Questions: Correlations | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Exercise | RM Questionnaire | Important to Perform Exercise | 0.39 |
| | | Role Model Exercise | 0.46 |
| | | Teaching Tool | 0.51 |
| | | Practice What They Preach | 0.45 |
| | | Role Model Not Smoking | 0.43 |
| | | Role Model Fruit and Vegetables | 0.38 |
| | | Role Model Healthy Weight | 0.39 |
| | | Important to Eat Fruit and Vegetables | 0.32 |
| | | Important to Maintain Healthy Weight | 0.34 |
| | | Important to Not Smoke | 0.35 |
| | HPLPII | Total Score | 0.39 |
| | | Physical Activity | 0.42 |
| | | Nutrition | 0.34 |
| | | Spiritual Growth | 0.31 |

**Weight question analysis**

Both the first and second null hypotheses were rejected for questions relating to physical activity and exercise. Statistically significant correlations were found between all questions relating to the topic of weight ($p < .001$) including SPTA personal weight maintenance, expectations for recommending healthy weight to future patients and the perception of role modeling to patients (Table 7). The expectation of educating patients on the importance of maintaining healthy weight was strongly correlated with the importance of physical therapy professionals role modeling maintaining a healthy weight ($\gamma=0.37$) and had a moderately strong correlation with maintaining healthy weight ($\gamma=0.44$). Strong correlations were also noted with the belief of role modeling being a powerful teaching tool ($\gamma=0.54$) and the importance of physical therapy professionals practicing what they preach ($\gamma=0.45$).

Educating patients on maintaining healthy weight also was strongly correlated

with performing regular physical activity (γ=0.47) and role modeling regular physical activity (γ=0.41). Moderate correlations were found between eating and role modeling eating fruits and vegetables (respectively, γ=0.32, γ=0.37), role modeling abstaining from tobacco products (γ=0.0.35), HPLPII total score (γ=0.38), HPLPII Nutrition sub-score (γ=0.34) and HPLPII Spiritual Growth sub-score (γ=0.38).

| **Table 7: Weight Questions: Correlations** | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Weight | RM Questionnaire | Important to Maintain Healthy Weight | 0.37 |
| | | Role Model Healthy Weight | 0.44 |
| | | Practice What They Preach | 0.45 |
| | | Teaching Tool | 0.54 |
| | | Important to Perform Exercise | 0.47 |
| | | Role Model Exercise | 0.41 |
| | | Important to Eat Fruit and Vegetables | 0.32 |
| | | Role Model: Not Smoking | 0.35 |
| | | Role Model: Fruit and Vegetables | 0.37 |
| | HPLPII | Total Score | 0.38 |
| | | Nutrition | 0.34 |
| | | Spiritual Growth | 0.38 |

**Diet and nutrition question analysis**

Both the first and second null hypotheses were rejected for questions relating to diet and nutrition. Statistically significant correlations were found between all questions relating to the topic of diet and nutrition (p <.001) including SPTA personal diet and nutrition, expectations for recommending healthy diet changes to future patients and the perception of role modeling to patients (Table 8). All questions relating to the topic of diet and nutrition were strongly correlated. The importance of educating patients on a healthy diet was strongly correlated with eating and role modeling eating five servings of fruit and vegetables (respectively, γ=0.41, γ=0.49) and the HPLPII Nutrition sub-score (γ=0.46).

The importance of educating patients on eating a healthy diet also was strongly correlated with the belief of role modeling being a powerful teaching tool (γ=0.43), performing regular physical exercise (γ=0.46), and role modeling abstaining from the use of tobacco products (γ=0.42). Moderate correlations were noted for the importance of physical therapy providers practicing what they preach (γ=0.38), maintaining healthy weight (γ=0.345), abstaining from the use of tobacco products (γ=0.33), role modeling performing regular physical activity (γ=0.37), role modeling maintaining healthy weight (γ=0.39), HPLPII total score (γ=0.36), and HPLPII Spiritual Growth sub-score (γ=0.30).

| **Table 8: Diet and Nutrition Questions: Correlations** | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Diet | RM Questionnaire | Important to Eat Fruit and Vegetables | 0.43 |
| | | Role Model Eating Fruit and Vegetables | 0.47 |
| | | HPLPII Nutrition | 0.46 |
| | | Teaching Tool | 0.43 |
| | | Practice What They Preach | 0.38 |
| | | Important to Perform Exercise | 0.46 |
| | | Role Model Exercise | 0.37 |
| | | Important to Maintain Healthy Weight | 0.35 |
| | | Role Model Healthy Weight | 0.39 |
| | | Important to Not Smoke | 0.33 |
| | | Role Model: Not Smoking | 0.42 |
| | HPLPII | Total Score | 0.36 |
| | | Nutrition | 0.46 |
| | | Spiritual Growth | 0.30 |

**Tobacco question analysis**

Both the first and second null hypotheses were rejected for questions relating to tobacco use. Statistically significant correlations were found between all questions relating to the topic of tobacco use (p <.001) including SPTA personal tobacco use, expectations for recommending stopping tobacco use to future patients and the perception

of role modeling to patients (Table 9). Statistically significant correlations were discovered between all questions relating to the topic of tobacco use. Educating patients on decreasing or stopping the use of tobacco products was strongly correlated with perceptions about the importance of physical therapy providers abstaining from, and role modeling abstaining from, the use of tobacco products (respectively, $\gamma$=0.41, $\gamma$=0.49).

The importance of educating patients on decreasing or stopping the use of tobacco products also was moderately correlated with the belief about role modeling being a powerful teaching tool ($\gamma$=0.39), the importance of physical therapy providers practicing what they preach ($\gamma$=0.36), performing regular physical exercise ($\gamma$=0.31), and role modeling performing regular physical activity ($\gamma$=0.36).

**Table 9: Tobacco Questions: Correlations**

| Variables | | | $\gamma$ ($p<.001$) |
|---|---|---|---|
| Expectation: Patient Education – Tobacco | RM Questionnaire | Important not to Use Tobacco | 0.41 |
| | | Role Model Not Using Tobacco | 0.498 |
| | | Teaching Tool | 0.39 |
| | | Practice What They Preach | 0.36 |
| | | Important to Perform Exercise | 0.31 |
| | | Role Model: Exercise | 0.36 |

**Multivariate Logistic Regression**

Multivariate logistic regression was conducted to determine the strength of associations that exist in the data. For each question on the Expectation questionnaire, all variables from the RM and HPLPII questionnaires were entered into the analysis. Next, backward elimination was performed, removing any variable with a p-value greater than 0.05 and the regression run again.

Modeling the Expectation survey questions, the regression revealed that the $r^2$ was very small. However small the $r^2$, it can be determined that a variety of variables

contributed to the fit of the model.

- For the topic of educating patients on physical activity, 73.9% of the change in participant responses was predicted by four variables: the HPLPII Physical Activity subscore (34.3%), the HPLPII Interpersonal Relations subscore (15.1%), role modeling being a teaching tool (13.6%), and the importance of practicing that they preach (10.9%).
- For the topic of educating patients on maintaining healthy weight, 98.4% of the change in participant responses was predicted by four variables: the HPLPII Spiritual Growth subscore (37.2%), the HPLPII Nutrition subscore (21.6%), the importance of personally performing exercise (20.1%), and role modeling being a teaching tool (19.5%).
- For the topic of educating patients on eating a healthy diet, 93.5% of the change in participant responses was predicted by three variables: the HPLPII Nutrition subscore (59.9%), the importance of personally performing exercise (14.6%), and the HPLPII Spiritual Growth subscore (19.0%).

## DISCUSSION

A relationship has been established between a healthcare provider's personal health behaviors and health education and counseling provided to patients.[6,8,13,16,17,20,22,25,26,28,33-6,38-40] Role modeling healthy weight and physical fitness also have been associated with increased patient compliance with a provider's recommendations, including implementing healthy lifestyle modifications.[3,20,22] At this time, the personal health habits and role modeling attitudes of physical therapy providers are largely unknown. The few studies on these topics have been performed with PTs, PTAs, and SPTs with no studies including SPTAs. The purpose of this study was to attempt to fill the gap in literature by examining how SPTAs' personal health habits and perceptions of role modeling influence the students' expectations for recommending healthy lifestyle changes to patients.

The first null hypothesis was that there would be no relationship between SPTA personal health behaviors and expectations for recommending healthy lifestyle changes to future patients. This null hypothesis was rejected. The results indicate that the SPTAs' personal health behaviors for the topics of physical activity and exercise, weight, and diet and nutrition are correlated with expectations for recommending these health behaviors to patients. These findings concur with previous studies conducted with a variety of health care providers, including PTs, PTAs, and SPTs.[6,8,13,16,17,20,22,25,26,28,33-36,38,40]

The second null hypothesis was that there would be no correlation between SPTA personal health behaviors and the perception of role modeling to patients. This null hypothesis also was rejected. The results of this study indicate correlations exist between the SPTAs' personal health behaviors for the topics of physical activity and exercise,

weight, and diet and nutrition. Further, the results indicate the belief of role modeling being a powerful teaching tool as well as the importance of physical therapy providers practicing what they preach. This concurs with a previous study performed with PTs and SPTs.[22]

**Demographics**

The final response rate of 29.7% is comparable to other questionnaire based research, which was found to be approximately 20-40 percent.[1,8,12,16,21 22,41,44] Studies with higher response rates typically were performed in countries other than the US or with students who completed questionnaires as a component of their coursework or at yearly orientation.[2,4,10,17,29]

While the participants in this study were a convenience sample, the sample appears to represent the SPTAs enrolled in PTA programs during the 2015-2016 academic year, including similar demographics. The 35 PTA programs in this study represent 10.3% of the 340 accredited PTA programs in 2015-2016, including public and private institutions.[49] Participants represented 2.6% of the 12,726 SPTAs enrolled in all accredited PTA programs in 2015-2016.[49] The programs participating in this study had a mean number of 29.7 SPTAs enrolled (n=7-76) which is comparable to the CAPTE reported average of 40 students in each PTA program in 2015-2016.[49] Demographics for all enrolled SPTAs in 2013, the last year of available data, were reported by CAPTE as 66.76% female and 79.4% Caucasian, comparable to this study's participants who were 71.01% female and 81.60% Caucasian.[49] Even so, generalization of these results to the entire SPTA population should be done with caution.

Throughout the analysis, no demographic was correlated to any question on the HPLPII, RM questionnaire, or Expectation questionnaire. Only one prior study noted a difference in the personal health behaviors between male and female physical therapy providers, which was not replicated in this study.[22] It is possible that the high percentage of Caucasian females in this study, while comparable to all SPTAs, did not allow for demographic correlations to be revealed.

**Personal Health Behavior Performance**

A healthcare provider is more likely to counsel patients to make healthy lifestyle changes that the provider personally performs.[6,8,13,16,17,20,22,25,26,28,33-36,38,40] When a provider role models healthy behaviors, including maintaining healthy weight, patients are more likely to report higher motivation to change their health behaviors [6,16,17,22,26,28,31,33,35,41] as well as follow all recommendations made by that provider.[3,18,25,45] Examining the current health habits of healthcare students can be an indicator of future patient care practices. Further, when a patient is treated by a healthcare provider who role models healthy behaviors, the patient is more likely to attempt to make, and be successful at performing, healthy lifestyle changes.[19,28,33,38,41] Prior studies also have concluded that PTs, SPTs, and PTAs are more likely to have better personal health habits when compared to other healthcare providers and the general population.[8,16,17,22] The results of this study support previous findings, with the SPTAs in this study scoring highly on the total HPLPII and each subscore.

**Role Modeling Attitudes**

Prior research has shown that providers who maintain healthy weight and perform regular physical exercise are viewed as more trustworthy and credible by their patients when providing health behavior counseling.[3,20-22] Further, PTs and SPTs have reported that physical therapy providers are responsible for role modeling of healthy behaviors.[10,22,45]

The results this study indicate SPTAs' role modeling attitudes are comparable to other studies performed on physical therapy providers. Role modeling attitudes can be directly compared to the 2012 study by Black et al. which used the same RM questionnaire and was performed with PTs and SPTs.[22] The belief that role modeling the performance of physical activity was important for physical therapy providers also was reported by 91% of PTs and SPTs in the 2010 study by Shirley et al., which is comparable to the results of this study.[4]

**Patient Education on Healthy Behaviors**

Prior research has concluded that patients are more likely to attempt to change, and be successful in changing, personal health behaviors when healthcare providers supply education on the topics of increasing physical exercise, diet, smoking cessation, and decreasing alcohol consumption.[6,24,25,31,34] Because of this, establishing current SPTAs' perceptions of providing patient education on the topics of healthy behaviors can assist in determining opportunities and weaknesses in the current educational structure in order to improve future patient care and physical therapy outcomes. In this study, age and gender did not contribute to any changes in HPLPII scores.

Most SPTAs in this study perceived they often or routinely will educate their patients on meeting physical activity guidelines (76.4%) which was lower than studies that included only PTs and SPTs (97%,[4] 99%[5]). Of note, in the 2004 study by Rea et al., the only study found asking PTs to report the amount of patient education they actually performed, PTs reported performing patient education on increasing physical activity 54% of the time.[15]

No other studies were found to compare how often PTs, PTAs, or SPTs perceived they would provide patient education on other healthy behavior topics. The 2004 study by Rea et al. where PTs reported the actual amount of patient education provided was the only comparison available. The discrepancy seen between the perceived and actual amounts of patient education provided on increasing physical activity was present for recommending other healthy behavior changes to patients. The percentage of time PTs reported providing patient education on the topics of nutrition and weight was 19.1% compared to the SPTAs in this study with 78.6% perceiving they would provide education on maintaining healthy weight and 55.2% on eating a healthy diet.[15] In the 2004 study by Rea et al., PTs reported educating patients on decreasing the use of tobacco products 16.5% of the time compared SPTAs' perception of 77.9%.[15] In the same study, the percentage of time PTs reported performing patient education on stress management techniques was 41.4% compared to the SPTAs' perception of 61.8%. [15]

**Multivariate Logistic Regression**

The multivariate logistic regression did not indicate a specific factor that most influenced SPTAs to recommend healthy lifestyle changes to their future patients. It is

possible that a specific factor responsible for the association was not included as a question in this study. However, based on the results of the multivariate logistic regression and the literature review, it appears SPTAs' perceptions of recommending healthy lifestyle changes to patients are derived from a variety of multifaceted factors.

**Personal health behaviors and expectations for recommending healthy changes**

One of the factors contributing to recommending healthy lifestyle changes to patients is the personal performance of that healthy behavior.[6,8,13,16,17,20,22,25,26,28,33-36,38,40] The results of this study also demonstrated a relationship between SPTAs' personal performance of healthy behaviors and their expectation for recommending healthy lifestyle changes to future patients.

The HPLPII composite score and subscores were used to determine the SPTAs' personal health behaviors for this study and was included in the multivariate logistic regression. The HPLPII physical activity subscore was used in this study to measure regular, personal participation in physical activity and accounted for 34.3% of the change in providing patient education on the topic of physical activity, the largest change for all variables on this topic. Further, the HPLPII Nutrition subscore which measured personally eating a healthy diet, accounted for the largest change in providing patient education on the topic of eating a healthy diet at 59.9%.

Patient education on the topic of maintaining healthy weight was influenced by the personal health behaviors on three HPLPII subscores. The HPLPII Nutrition subscore accounted for 21.6% of the change and the belief in the importance of personally

performing exercise accounted for another 20.1% of the change. Interestingly, the HPLPII Spiritual Growth subscore accounted for 37.2% of the change in SPTA responses on the topic of maintaining healthy weight. This subscore did not include any questions regarding weight, diet or exercise. Instead it included questions such as feeling one is positively changing, believing one's life has purpose, looking forward to the future, being contented with oneself, working towards long-term life goals, and finding each day interesting, which may be related to self-esteem or some other psychological characteristics.

Therefore, the results of this study concurred with the findings of prior studies. Furthermore, the first null hypothesis that there is no relationship between SPTA personal health behaviors and expectations for recommending healthy lifestyle changes to future patients should be rejected. For clinical practice, these results demonstrate SPTAs' personal health behaviors do influence expectations for recommending healthy lifestyle changes to patients, an important step in improving patients' health behaviors and overall health.

**Personal health behaviors and role modeling**

As in prior studies performed with PTs, PTAs and SPTs, there was a correlation between a provider's personal health behaviors and their attitudes toward the importance of role modeling healthy behaviors for their patients.[10,22,45] The multivariate logistic regression coefficients showed that the belief that role modeling is a teaching tool was responsible for 20.4% of the change in providing patient education to increase physical activity and 19.5% of the change in providing patient education to maintain healthy

weight. The belief that it is important for physical therapy providers to role model performing exercise was responsible for 13.3% of the change in the expectation regarding providing patient education to increase physical activity. The belief in the importance of personally performing exercise was responsible for 20.1% of the change in providing patient education to maintain healthy weight and 14.6% of the change in providing patient education to eat a healthy diet. The belief that it is important for physical therapy providers to role model eating five servings of fruit and vegetables was responsible for an additional 15.1% of the change in providing patient education to eat a healthy diet.

Although there was not a strong goodness of fit with the multivariate logistic regression, it still supports the rejection of the second null hypothesis that there is no relationship between SPTA personal health behaviors and their attitudes toward the importance of role modeling healthy behaviors for their patients. For clinical practice, these results demonstrate SPTAs' personal health behaviors do influence their attitudes towards the importance of role modeling. This is important for optimal patient care as prior research has concluded that patients are more likely to follow the advice of healthcare providers who role model healthy behaviors.

**Implications**

The results of this study reveal that the expectation of providing patient education is influenced by a variety of factors. Therefore, to positively affect the amount of patient education provided to future patients, a multifaceted approach will need to be incorporated in formal education. Because the amount of health behavior education healthcare providers receive and their personal health habits impact practice patterns,

these facets need to be addressed frequently during formal education.[12,32]

In a 2013 study by McMahon and Connolly, only 41.4% of PTs reported having sufficient knowledge of health behavior change theory with just over half reporting getting health promotion education training in school and only 29% reporting continuing education in health behavior counseling after graduation.[12] No data exists for PTAs' or SPTAs' understanding of health behavior change theory, health promotion education, or self-efficacy for patient education on healthy behaviors. It should be noted that the length of formal education required to become a PT is much longer than for a PTA and CAPTE sets the guidelines for both educational processes. This makes it likely that clear gaps in knowledge seen in the formal educational process of PTs also will occur in PTAs.

Multiple studies have shown that PTs and SPTs have better health behaviors compared to the general population as well as other healthcare providers.[10,16,17,19,22,23,38] It is possible that healthier individuals self-select into the physical therapy profession or that health behaviors improve during the course of education and training. [17,19,22,38] Because of the generally high level of personal health behaviors, discussion and support of the importance of personal health behaviors may not be addressed fully during formal education. It is important to note that some students may have physical limitations or acquire musculoskeletal injuries as practicing physical therapy professionals, making role modeling all healthy behaviors difficult. By ensuring SPTAs receive strong foundational formal education on the importance of personal health behaviors and providing patient education, it is possible that PTAs can provide strong patient education and improve patient outcomes throughout their careers.

**Future Research**

In order to determine what additional education, resources, and support may be most appropriate, future research may include studies to determine SPTAs' and PTAs' current levels of knowledge of health promotion education and health behavior counseling. The development of a controlled study to collect longitudinal data for SPTAs at the start and end of their educational experience as well as at various times after graduation could assist in determining knowledge gained during formal education and the increase or decrease in that knowledge over time. This should include the education physical therapy providers receive on the topics of personal healthy lifestyle habits and educating patients on these habits. The personal health habits of PTAs also should be determined to understand what pre- and post- graduation resources and education would most promote improved patient care. What educational components are most effective, as well as additional education most effective during school and after graduation, should be determined to encourage students to maintain or improve their personal health behaviors and improve patient care.

Because the Expectation questionnaire was developed for this study, further development of this instrument to improve validity may lead to a stronger instrument with better data collected and more valid conclusions. The instrument could be refined to better determine the most influential factors in providing health behavior education and physical therapy providers' perceived benefits of healthy behaviors.

Future research should examine patients' attitudes toward physical therapists discussing health behaviors with them and the impact that role modeling may have on the success of these discussions. Studies to determine the amount and type of patient

education on healthy behaviors as well as patient compliance with recommendations to improve health behaviors also could be studied. A larger sample size including both APTA members and nonmembers would increase generalizability of the results.

**Assumptions**

The primary assumptions underlying this study are that the survey respondents were: the intended audience of SPTAs; that the questions were clearly understood; and the respondents were honest, accurate, objective, and reflective in their answers to the questions. Further, the pilot study and the use of experts was able to provide good internal consistency for validity of the Expectation questionnaire.

**Strengths**

There are several strengths to using a study with cross-sectional design. Questionnaire based research using a Likert scale is ethically safe, cost effective, provides efficient collection of a large amount of quantitative data in a short period of time on a variety of variables, allows for the ability to replicate the research, and has the potential for generalizability. In addition, while causality cannot be established, the presence or absence of relationships between study variables can be determined. A questionnaire based study also is useful to assist in the generation of hypotheses. Despite the participants being a convenience sample, they do appear to well represent the target population of all SPTAs.

**Limitations**

The instructors invited to participate were all members of the APTA and active on APTA message boards and the participants in this study were chosen as a convenience sample. This may not accurately represent the target population of all SPTAs. While it appears the demographics of the participants were quite similar to those of all SPTAs, which suggests that the participants were representative of the SPTA population, generalization of the results should be done with caution. Cross-sectional study design also has several known limitations. First, only correlations can be established, not causality. This does not allow the establishment of temporality between personal health behavior variables and role modeling attitudes.

There is potential for several biases within self-reported, questionnaire based research including recall bias, nonresponse bias, and social desirability bias. First, asking any participant to recall personal past behaviors can lead to some measurement error, as reported data may not be as accurate as intended. Further, some PTA instructors may have used class time for the participants to complete the questionnaire. Therefore, some participants may have felt pressure to participate and therefore not fully have read the questions or answered as truthfully as desired, also leading to response bias measurement error. Next, individuals who participate in, or have an interest in, healthy behaviors may be more likely to complete the questionnaire so those who did not participate may have had poorer personal health behaviors.[22,51-57]

Social desirability bias may occur when participants provide answers they perceive to be most acceptable, or how they "should" answer. Since SPTAs are training as healthcare providers, they know that healthy behaviors are more desirable and,

therefore, may provide responses they feel are “correct” instead of providing accurate responses based on self reflection. This could affect the validity and reliability of responses.[4,17,22,51-57] Several studies have shown that social desirability bias is best minimized if results are taken from a large group, but there is no specific manner of data collection known to decrease social desirability bias.[51,53,57] Given the potential for these biases, generalization of these results to the entire SPTA population should be done cautiously.

## Conclusion

To the author's knowledge, this is the first study to report on SPTA personal health behaviors, role modeling attitudes or expectations for recommending healthy lifestyle changes to patients. This research has shown that a significant portion of SPTAs participate in healthy behaviors, feel that role modeling healthy behaviors is a necessary component of being a physical therapy providers, and that they should recommend healthy behavior changes to patients.

The literature review documented a clear relationship between a healthcare provider's personal health behaviors and the amount and type of health education counseling provided to patients.[6,8,13,16,17,20,22,25,26,28,33-6,38-40] In addition, patient compliance with recommendations has been shown to decrease when the recommendations are made by a healthcare provider who does not role model healthy behaviors.[18,45] When healthy behaviors were role modeled, patients reported being more open to health behavior counseling and having greater motivation to change their health behavior.[6,16,17,22,26,28,31,33,35,41] Because the universal goal of physical therapy is to identify movement deficits, maximize function, and improve health-related quality of life, providing patient education on healthy behaviors is a critical part of physical therapy intervention.[10,13,14,17,19] Therefore, the health behaviors of SPTAs in this study can be an indicator of the future patient care practices of the profession.

The literature also indicates that increasing patient education results in increased patient effort and likelihood of improvement in healthy behaviors.[6,24,25,31,34] Further, the amount and type of health behavior education that healthcare providers receive impacts the health behavior education provided to patients.[6,29,30,33,34,36,37] SPTAs' favorable

attitudes towards recommending healthy behavior changes to their patients increase the likelihood of positively influencing patients' attitudes, behaviors, and health in a cost effective manner. This would result in both treating and preventing chronic health conditions.[19,21,31]

Physical therapy providers regularly focus on altering patient behaviors, have expertise in prescribing safe physical activity for ill, injured and fragile populations, and maintain the belief that health promotion is integral to providing appropriate physical therapy patient care.[10-14,16,17,19,32] With increasing numbers of patients receiving care from physical therapy providers for conditions caused or exacerbated by poor health habits, education for both providers and patients is vitally important. This study indicates areas of strengths and some for possible improvement in SPTA education in order to promote positive personal health habits that could affect future counseling practices, potentially leading to improved patient care and outcomes.

**References**


1. Downs A, Wile N, Krahn G, Turner A. Wellness promotion in persons with disabilities: physicians' personal behaviors, attitudes, and practices. *Rehabil Psychol*. 2004;49(4):303-308.
2. Lobelo F, Duperly J, Frank E. Physical activity habits of doctors and medical students influence their counselling practices. *Br J Sports Med*. 2009;43(2):89-92.
3. Puhl R, Gold J, Luedicke J, DePierre J. The effect of physicians' body weight on patient attitudes: implications for physician selection, trust and adherence to medical advice. *Int J Obes*. 2013;37(11):1415-1421.
4. Shirley D, van der Ploeg H, Bauman A. Physical activity promotion in the physical therapy setting: perspectives from practitioners and students. *Phys Ther*. 2010;90(9):1311-1322.
5. Mouton A, Mugnier B, Demoulin C, Cloes M. Physical Therapists' Knowledge, Attitudes, and Beliefs About Physical Activity: A Prerequisite to Their Role in Physical Activity Promotion? *J Phys Ther Educ*. 2014;28(3):120-127.
6. Oberg E, Frank E. Physicians' health practices strongly influence patient health practices. J *R Coll Physicians Edinburgh*. 2009;39(4):290-291.
7. Pignataro R, Ohtake P, Swisher A, Dino G. The role of physical therapists in smoking cessation: opportunities for improving treatment outcomes. *Phys Ther*. 2012;92(5):757-766.
8. Goodgold S. Wellness promotion beliefs and practices of pediatric physical therapists. *Pediatr Phys Ther*. 2005;17(2):148-157.

9. Commission on Accreditation in Physical Therapy Education. 2012-2013 Fact Sheet Physical Therapist Assistant Education [Web document]. Oct 24, 2013. http://www.capteonline.org/uploadedFiles/CAPTEorg/About_CAPTE/Resources/Aggregate_Program_Data/AggregateProgramData_PTAPrograms.pdf#search=%22aggregate program data%22. Accessed April 21, 2015.
10. Glazer-Waldman HR, Hart JP, LeVeau BF. Health beliefs and health behaviors of physical therapists. *Phys Ther*. 1989;69:204-210.
11. Ingman MS, Eckstrom A, Fisher A, Johnson M, Laska J, Weimass M. Physical therapists' knowledge, beliefs, barriers, and practices in the areas of health promotion and fitness testing. *Cardiopulm Phys Ther J*. 2011;22(4):38-39.
12. McMahon N, Connolly C. Health promotion knowledge, attitudes and practices of chartered physiotherapists in Ireland: A national survey. *Physiother Pract Res*. 2013;34(1):21-28.
13. Verhagen E, Engbers L. The physical therapist's role in physical activity promotion. *Br J Sports Med*. 2009;43(2):99-101.
14. Jewell D. The role of fitness in physical therapy patient management: applications across the continuum of care. *Cardiopulm Phys Ther J*. 2006;17(2):47-62.
15. Rea B, Marshak H, Neish C, Davis N. The role of health promotion in physical therapy in California, New York and Tennessee. *Phys Ther*. 2004;84(6):510-523.
16. Fink M, Black B, Butt S, Fenning S, Sharkey K. Health Behaviors of Physical Therapists and Physical Therapist Students in South-central Pennsylvania. *HPA Resource*. 2014;14(4):J1-j14.
17. Chevan J, Haskvitz E. Do as I do: exercise habits of physical therapists, physical

therapist assistants, and student physical therapists. *Phys Ther*. 2010;90(5):726-734.

18. Sobush DC, Fehring RJ. Physical fitness of physical therapy students. *Phys Ther*. 1983;63:1266-1273.p
19. Dąbrowska-Galas M, Plinta R, Dąbrowska J, Skrzypulec-Plinta V. Physical activity in students of the Medical University of Silesia in Poland. *Phys Ther*. 2013;93(3):383-392.
20. Joy E, Blair S, McBride P, Sallis R. Physical activity counseling in sports medicine: a call to action. *Br J Sports Med*. 2013;47(1):49-53.
21. Groth J, Ayers S, Miller M, Arbogast W. Self-Reported Health and Fitness Habits of Certified Athletic Trainers. *J Athl Train*. 2008;43(6):617-623.
22. Black B, Marcoux B, Stiller C, Qu X, Gellish R. Personal health behaviors and role-modeling attitudes of physical therapists and physical therapist students: a cross-sectional study. *Phys Ther*. 2012;92(11):1419-1436.
23. Ferrara C, Nobrega C, Dulfan F. Obesity, diet, and physical activity behaviors of students in health-related profession. *Coll Stud J*. 2013;47(3):560-565.
24. Geense W, van de Glind I, Visscher T, van Achterberg T. Barriers, facilitators and attitudes influencing health promotion activities in general practice: an explorative pilot study. *BMC Fam Pract*. 2013;14(1):20-29.
25. Hash RB, Munna RK, Vogel RL, Bason JJ. Does physician weight affect perception of health advice? *Prev Med.* 2002;36:41-44.
26. Frank E. Physician health and patient care. *JAMA.* 2004;291(5):637.
27. Irēna K, Anna M, Anda B. Physical activity and its relation to health-related

physical fitness in students. *Ovidius University Annals, Series Physical Education Sport/Science, Movement Health*. 2012;12(2):256-263.

28. Oberg E. Be a better doctor by practicing what you preach. *Integr Med*. 2010;9(3):22-25.
29. Frank E, Elon L, Spencer E. Personal and clinical tobacco-related practices and attitudes of U.S. medical students. *Prev Med.* 2009:49(2–3): 233–9.
30. Wilkinson C, Pennington T, Barney D, Lockhart B, Hager R, Prusak K. PETE students' perceptions of a healthy and active lifestyle. *Phys Educator*. 2014;71(4):644-659.
31. Burke L, Fair J. Promoting prevention: skill sets and attributes of health care providers who deliver behavioral interventions. *J Cardiovasc Nurs*. 2003;18(4):256-266.
32. Boll M, Boström-Lindberg E. Physiotherapists' understanding and approach to health promotion work in compulsory school: perceiving and supporting coherence. *Physiother Theory Pract*. 2010;26(5):318-326.
33. Duperly J, Lobelo F, Frank E, et al. The association between Colombian medical students' healthy personal habits and a positive attitude toward preventive counseling: cross-sectional analyses. *BMC Public Health*. 2009;9:218.
34. Crawford P, Gosliner W, Yancey A, et al. Walking the talk: Fit WIC wellness programs improve self-efficacy in pediatric obesity prevention counseling. *Am J Public Health*. 2004;94(9):1480-1485.
35. Frank E, Breyan J, Elon L. Physician disclosure of healthy personal behaviors improves credibility and ability to motivate. *Arch Fam Med.* 2000;9:287-290.

36. Cameron D, Katch E, Anderson P, Furlong M. Healthy doctors, healthy communities. *J Ambul Care Manage*. 2004;27(4):328-338.
37. Spollen J, Thrush C, Mui D, Woods M, Tariq S, Hicks E. A randomized controlled trial of behavior change counseling education for medical students. *Med Teach*. 2010;32(4):e170-7.
38. Kamwendo K. Adherence to healthy lifestyles: a comparison of occupational therapy students with nursing and physiotherapy students. *Scand J Occup Ther*. 2000;7(4):156-164.
39. Frank E, Segura C, Shen H, Oberg E. Predictors of Canadian physicians' prevention counseling practices. *Can J Public Health.* 2000:101(5): 390–5.
40. Frank E, Dresner Y, Shani M, Vinker S. The association between physicians' and patients' preventive health practices. *Can Med Assoc J*. 2013;185(8):649-653.
41. Van der Veer T, Frings-Dresen M, Sluiter J. Health behaviors, care needs and attitudes towards self-prescription: a cross-sectional survey among Dutch medical students. *PLos One*. 2011;6(11):e28038.
42. Centers for Disease Control and Prevention. Healthy Weight – it's not a diet, it's a lifestyle! About BMI for adults [Web page]. http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/. Accessed April 19, 2015.
43. Biernat E, Poznańska A, Gajewski A. Is physical activity of medical personnel a role model for their patients. *Ann Agric Environ Med*. 2012;19(4):707-710.
44. Abramson S, Stein J, Schaufele M, Frates E, Rogan S. Personal exercise habits and counseling practices of primary care physicians. *Clin J Sport Med.* 2000;

10:40-48.

45. Balogun JA. Assessment of physical fitness of female physical therapy students. *J Orthop Sports Phys Ther*. 1987;8(11):525-32.
46. Kotwica A, majcher P. Physical fitness level of 1st year medicine and physiotherapy students of Lublin medical university. *Polish J Sport Tourism*. 2012;19(2):107-112.
47. Walker SN, Sechrist KR, Pender NJ. Health promotion model – instruments to measure health promoting lifestyle: Health-Promoting Lifestyle Profile [HPLP II] (Adult Version). Deep Blue University of Michigan Web site. 1995. http://deepblue.lib.umich.edu/handle/2027.42/85349. Accessed April 18, 2015.
48. Cardinal BJ, Cardinal MK, Drabbs MK, et al. Preliminary development of a scale to measure attitudes regarding the importance of role-modeling in physical activity and fitness behaviors among health, physical education, recreation, and dance professionals. *Percept Mot Skills*. 1998;86:627-630.
49. Commission on Accreditation in Physical Therapy Education. Home Page. Quick Facts. http://www.capteonline.org/home.aspx Accessed April 24,2016.
50. Rodriguez L, Neighbors C, Foster D. Priming effects of self-reported drinking and religiosity. *Psychol Addict Behav*. 2014;28(1):1-9.
51. Kimberlin C, Winterstein A. Validity and reliability of measurement instruments used in research. *Am J Health Syst Pharm*. 2008;65(23):2276-2284.
52. van de Mortel T. Faking it: social desirability response bias in self-report research. *Aust J Adv Nurs*. 2008;25(4):40-48.
53. Fastame M, Penna M. Does Social Desirability Confound the Assessment of Self-

Reported Measures of Well-Being and Metacognitive Efficiency in Young and Older Adults?. *Clin Gerontol*. 2012;35(3):239-256.

54. McMurray R, Ward D, Young D, et al. Do overweight girls overreport physical activity?. *Am J Health Behav*. 2008;32(5):538-546.
55. Adams S, Matthews C, Hebert J, et al. The effect of social desirability and social approval on self-reports of physical activity [corrected] [published erratum appears in *Am J Epidemiol* 2005 May 1;161(9):899]. *Am J Epidemiol*. 2005;161(4):389-398.
56. Ferrari P, Friedenreich C, Matthews C. The role of measurement error in estimating levels of physical activity. *Am J Epidemiol*. 2007;166(7):832-840.
57. Jones S, Knapik J, Sharp M, Darakjy S, Jones B. The validity of self-reported physical fitness test scores. *Military Medicine*. 2007;172(2):115-120.
58. Hulme P, Walker S, Effle K, Jorgensen L, McGowan M, Nelson J, Pratt E. Health-Promoting Lifestyle Behaviors of Spanish-Speaking Hispanic Adults. *J Transcult Nurs*, 2003:14(3), 244-254.
59. Padden D, Connors R, Posey S, Ricciardi R, Agazio J. Factors influencing a health promoting lifestyle in spouses of active duty military. *Health Care Women Int*, 2013;34(8), 674-93.
60. Berger A, Walker S. An explanatory model of fatigue in women receiving adjuvant breast cancer chemotherapy. *Nurs Res*, 2001;50(1), 42-52.
61. Grace S, Grewal K, Arthur H, Abramson B, Stewart D. A prospective, controlled multisite study of psychosocial and behavioral change following women's cardiac rehabilitation participation. *J Women's Health*, 2008;17(2), 241-8.

62. Hamilton J, Kives, Micevski V, Grace, S. Time Perspective and Health-Promoting Behavior in a Cardiac Rehabilitation Population. *Behav Med*, 2003;28(4), 132-139.

63. Stark M, Hoekstra T, Hazel D, Barton B. Caring for self and others: Increasing health care students' healthy behaviors. *Work.* 2012;42(3): 393-401.

64. Hensel, D. Relationships among nurses' professional self-concept, health, and lifestyles. *West J Nurs Res.* 2011;33(1), 45-62.

**Appendix 1-1** Health Promoting Lifestyle Profile II Questionnaire (HPLPII)

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits. Please respond to each item as accurately as possible, and try not to skip any item. Indicate the frequency with which you engage in each behavior by circling:

**N** for never, **S** for sometimes, **O** for often, or **R** for routinely

| | Never | Sometimes | Often | Routinely |
|---|---|---|---|---|
| 1. Discuss my problems and concerns with people close to me. | N | S | O | R |
| 2. Choose a diet low in fat, saturated fat, and cholesterol. | N | S | O | R |
| 3. Report any unusual signs or symptoms to a physician or other health professional. | N | S | O | R |
| 4. Follow a planned exercise program. | N | S | O | R |
| 5. Get enough sleep. | N | S | O | R |
| 6. Feel I am growing and changing in positive ways. | N | S | O | R |
| 7. Praise other people easily for their achievements. | N | S | O | R |
| 8. Limit use of sugars and food containing sugar (sweets). | N | S | O | R |
| 9. Read or watch TV programs about improving health. | N | S | O | R |
| 10. Exercise vigorously for 20 or more minutes at least three times a week (such as brisk walking, bicycling, aerobic dancing, using a stair climber). | N | S | O | R |
| 11. Take some time for relaxation each day. | N | S | O | R |
| 12. Believe that my life has purpose. | N | S | O | R |
| 13. Maintain meaningful and fulfilling relationships with others. | N | S | O | R |
| 14. Eat 6-11 servings of bread, cereal, rice and pasta each day. | N | S | O | R |
| 15. Question health professionals in order to understand their instructions. | N | S | O | R |
| 16. Take part in light to moderate physical activity (such as sustained walking 30-40 minutes 5 or more times a week). | N | S | O | R |
| 17. Accept those things in my life which I cannot change. | N | S | O | R |
| 18. Look forward to the future. | N | S | O | R |
| 19. Spend time with close friends. | N | S | O | R |
| 20. Eat 2-4 servings of fruit each day. | N | S | O | R |
| 21. Get a second opinion when I question my health care provider's advice. | N | S | O | R |
| 22. Take part in leisure-time (recreational) physical activities (such as swimming, dancing, bicycling). | N | S | O | R |
| 23. Concentrate on pleasant thoughts at bedtime. | N | S | O | R |
| 24. Feel content and at peace with myself. | N | S | O | R |
| 25. Find it easy to show concern, love and warmth to others. | N | S | O | R |

| | | | | |
|---|---|---|---|---|
| 26. Eat 3-5 servings of vegetables each day. | N | S | O | R |
| 27. Discuss my health concerns with health professionals. | N | S | O | R |
| 28. Do stretching exercises at least 3 times per week. | N | S | O | R |
| 29. Use specific methods to control my stress. | N | S | O | R |
| 30. Work toward long-term goals in my life. | N | S | O | R |
| 31. Touch and am touched by people I care about. | N | S | O | R |
| 32. Eat 2-3 servings of milk, yogurt or cheese each day. | N | S | O | R |
| 33. Inspect my body at least monthly for physical changes/danger signs. | N | S | O | R |
| 34. Get exercise during usual daily activities (such as walking during lunch, using stairs instead of elevators, parking car away from destination and walking). | N | S | O | R |
| 35. Balance time between work and play. | N | S | O | R |
| 36. Find each day interesting and challenging. | N | S | O | R |
| 37. Find ways to meet my needs for intimacy. | N | S | O | R |
| 38. Eat only 2-3 servings from the meat, poultry, fish, dried beans, eggs, and nuts group each day. | N | S | O | R |
| 39. Ask for information from health professionals about how to take good care of myself. | N | S | O | R |
| 40. Check my pulse rate when exercising. | N | S | O | R |
| 41. Practice relaxation or meditation for 15-20 minutes daily. | N | S | O | R |
| 42. Am aware of what is important to me in life. | N | S | O | R |
| 43. Get support from a network of caring people. | N | S | O | R |
| 44. Read labels to identify nutrients, fats, and sodium content in packaged food. | N | S | O | R |
| 45. Attend educational programs on personal health care. | N | S | O | R |
| 46. Reach my target heart rate when exercising. | N | S | O | R |
| 47. Pace myself to prevent tiredness. | N | S | O | R |
| 48. Feel connected with some force greater than myself. | N | S | O | R |
| 49. Settle conflicts with others through discussion and compromise. | N | S | O | R |
| 50. Eat breakfast. | N | S | O | R |
| 51. Seek guidance or counseling when necessary. | N | S | O | R |
| 52. Expose myself to new experiences and challenges. | N | S | O | R |

**Appendix 1-2** Permission for Use: Health Promoting Lifestyle Profile II

University of Nebraska Medical Center

COLLEGE OF NURSING
Community-Based Health Department

985330 Nebraska Medical Center
Omaha, NE 68198-5330
402/559-6382
Fax: 402/559-6379

Dear Colleague:

Thank you for your interest in the *Health-Promoting Lifestyle Profile II*. The original *Health-Promoting Lifestyle Profile* became available in 1987 and has been used extensively since that time. Based on our own experience and feedback from multiple users, it was revised to more accurately reflect current literature and practice and to achieve balance among the subscales. The *Health-Promoting Lifestyle Profile II* continues to measure health-promoting behavior, conceptualized as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization and fulfillment of the individual. The 52-item summated behavior rating scale employs a 4-point response format to measure the frequency of self-reported health-promoting behaviors in the domains of health responsibility, physical activity, nutrition, spiritual growth, interpersonal relations and stress management. It is appropriate for use in research within the framework of the Health Promotion Model (Pender, 1987), as well as for a variety of other purposes.

The development and psychometric evaluation of the English and Spanish language versions of the original instrument have been reported in:

Walker, S. N., Sechrist, K. R., & Pender, N. J. (1987). The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. Nursing Research, 36(2), 76-81.

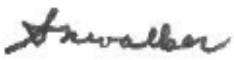
Walker, S. N., Volkan, K., Sechrist, K. R., & Pender, N. J. (1988). Health-promoting lifestyles of older adults: Comparisons with young and middle-aged adults, correlates and patterns. Advances in Nursing Science, 11(1), 76-90.

Walker, S. N., Kerr, M. J., Pender, N. J., & Sechrist, K. R. (1990). A Spanish language version of the Health-Promoting Lifestyle Profile. Nursing Research, 39(5), 268-273.



A copy of the instrument (English and Spanish versions), scoring instructions, an abstract of the psychometric findings, and a list of publications reporting research using all versions of the instrument are available for download.

Sincerely,



Susan Noble Walker, EdD, RN, FAAN
Professor Emeritus

**Appendix 2** Role Modeling Attitudes Questionnaire

Please indicate your level of agreement with each of the following statements using the following scale:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| 1. Role modeling is a powerful teaching tool for physical therapy professionals. | | | | | |
| 2. It is not enough to simply stay current in the field; physical therapy professionals must also "practice what they preach." | | | | | |
| 3. Involvement in CDC-recommended levels of regular physical activity* is a desirable and recommended behavior for physical therapy professionals. | | | | | |
| 4. Eating 5 or more servings of fruit and vegetables a day is a desirable and recommended behavior for physical therapy professionals. | | | | | |
| 5. Maintaining a healthy weight is a desirable and recommended behavior for physical therapy professionals. | | | | | |
| 6. Abstaining from smoking is a desirable and recommended behavior for physical therapy professionals. | | | | | |
| 7. It is important for physical therapy professionals to role model CDC-recommended levels of regular physical activity. | | | | | |
| 8. It is important for physical therapy professionals to role model nonsmoking behavior. | | | | | |
| 9. It is important for physical therapy professionals to be role models for eating 5 or more servings of fruits and vegetables a day. | | | | | |
| 10. It is important for physical therapy professionals to role models maintaining a healthy weight. | | | | | |

*The CDC defines regular cardiac/aerobic physical activity as: Moderate-intensity (such as brisk walking, bicycling, vacuuming, gardening or anything else that causes some increase in breathing or heart rate) for at least 30 minute on 5 or more days a week

**OR**

Vigourous-intensity (such as running, aerobics, heavy yard work, or anything else that causes large increases in breathing or heart rate) for at least 20 minutes on 3 or more days a week.

**Appendix 3** Expectation for Working as a Physical Therapist Assistant Questionnaire

Please answer the following questions based on what you expect to do when you are licensed and working as a Physical Therapist Assistant.

Never (0% of the chances when I could)
Rarely (1-25% of the chances when I could)
Sometimes (26-50% of the chances when I could)
Often (51-75% of the chances when I could)
Routinely (76-100% of the chances when I could)

| | Never | Rarely | Sometimes | Often | Routinely |
|---|---|---|---|---|---|
| 1. I will provide specific education to my patients advising them to meet daily physical activity guidelines.<br>• (30 minutes, 5 times a week: American College of Sport Medicine, American Heart Association) | | | | | |
| 2. I will provide specific education to my patients advising them to maintain a healthy weight. | | | | | |
| 3. I will provide specific education to my patients advising them to eat a healthy diet.<br>• 5 daily servings of fruits and vegetables; low salt, fat and sugar; minimal intake of fast foods | | | | | |
| 4. I will provide specific education to my patients advising them to decrease or stop the use of tobacco products. | | | | | |
| 5. I will provide specific education to my patients advising them to consume no more than the recommended amount of alcohol.<br>• Women: 1 drink per day; Men: 2 drinks per day (US Centers for Disease Control and Prevention) | | | | | |
| 6. I will provide specific education to my patients advising them to perform stress management techniques. | | | | | |
| 7. I will provide specific education to my patients advising them to get the recommended amount of sleep.<br>• Adults: 7-9 hours per night (US Centers for Disease Control and Prevention) | | | | | |

**Appendix 4-1 and 4-2** Gamma Correlation Analyses

| **Appendix 4-1 Gamma Correlations: Perceived Expectations for Recommending Healthy Lifestyle Changes and HPLPII Questionnaires** | | | |
|---|---|---|---|
| Variable | γ* (p<.001) | Variable | γ* (p<.001) |
| Patient Education: Exercise | | Patient Education: Alcohol | |
| HPLPII Total Score | .39 | HPLPII Total Score | .19 |
| HPLPII Health Responsibility | .26 | HPLPII Health Responsibility | .17 |
| HPLPII Physical Activity | .42 | HPLPII Physical Activity | .15 |
| HPLPII Nutrition | .34 | HPLPII Nutrition | .16 |
| HPLPII Spiritual Growth | .31 | HPLPII Spiritual Growth | .20 |
| HPLPII Interpersonal Relations | .27 | HPLPII Interpersonal Relations | .18 |
| HPLPII Stress Management | .27 | HPLPII Stress Management | .10 |
| Patient Education: Weight | | Patient Education: Stress Management | |
| HPLPII Total Score | .38 | HPLPII Total Score | .24 |
| HPLPII Health Responsibility | .24 | HPLPII Health Responsibility | .21 |
| HPLPII Physical Activity | .30 | HPLPII Physical Activity | .14 |
| HPLPII Nutrition | .34 | HPLPII Nutrition | .17 |
| HPLPII Spiritual Growth | .38 | HPLPII Spiritual Growth | .21 |
| HPLPII Interpersonal Relations | .29 | HPLPII Interpersonal Relations | .24 |
| HPLPII Stress Management | .29 | HPLPII Stress Management | .27 |
| Patient Education: Diet | | Patient Education: Sleep | |
| HPLPII Total Score | .36 | HPLPII Total Score | .30 |
| HPLPII Health Responsibility | .24 | HPLPII Health Responsibility | .22 |
| HPLPII Physical Activity | .29 | HPLPII Physical Activity | .17 |
| HPLPII Nutrition | .46 | HPLPII Nutrition | .24 |
| HPLPII Spiritual Growth | .30 | HPLPII Spiritual Growth | .30 |
| HPLPII Interpersonal Relations | .26 | HPLPII Interpersonal Relations | .28 |
| HPLPII Stress Management | .24 | HPLPII Stress Management | .31 |
| Patient Education: No Tobacco | | | |
| HPLPII Total Score | .22 | | |
| HPLPII Health Responsibility | .13 | | |
| HPLPII Physical Activity | .15 | | |
| HPLPII Nutrition | .22 | | |
| HPLPII Spiritual Growth | .24 | | |
| HPLPII Interpersonal Relations | .22 | | |
| HPLPII Stress Management | .12 | | |

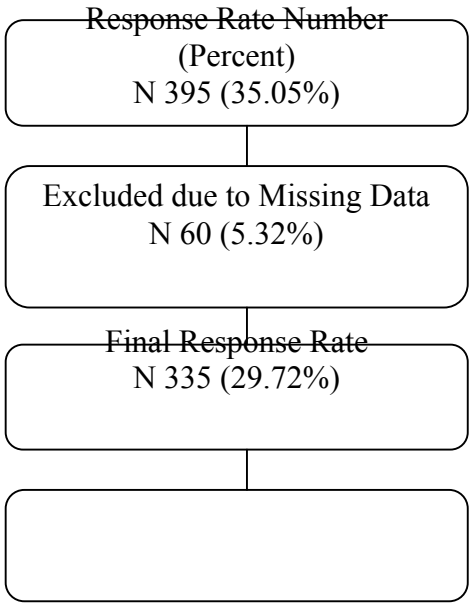
| Appendix 4-2 Gamma Correlations: Perceived Expectations for Recommending Healthy Lifestyle Changes and Role Modeling Questionnaires | | | |
|---|---|---|---|
| Variable | γ* (p<.001) | Variable | γ* (p<.001) |
| Patient Education: Exercise | | Patient Education: Alcohol | |
| Role Model: Teaching Tool | .51 | Role Model: Teaching Tool | .26 |
| Important to Practice What They Preach | .45 | Important to Practice What They Preach | .28 |
| Important to Perform Exercise | .39 | Important to Perform Exercise | .32 |
| Important to Eat Fruit and Vegetables | .32 | Important to Eat Fruit and Vegetables | .26 |
| Important to Maintain Healthy Weight | .34 | Important to Maintain Healthy Weight | .21 |
| Important to Not Smoke | .35 | Important to Not Smoke | .28 |
| Role Model: Exercise | .46 | Role Model: Exercise | .27 |
| Role Model: Not Smoking | .43 | Role Model: Not Smoking | .31 |
| Role Model: Fruit and Vegetables | .38 | Role Model: Fruit and Vegetables | .38 |
| Role Model: Healthy Weight | .39 | Role Model: Healthy Weight | .23 |
| Patient Education: Weight | | Patient Education: Stress Management | |
| Role Model: Teaching Tool | .54 | Role Model: Teaching Tool | .34 |
| Important to Practice What They Preach | .45 | Important to Practice What They Preach | .35 |
| Important to Perform Exercise | .47 | Important to Perform Exercise | .27 |
| Important to Eat Fruit and Vegetables | .32 | Important to Eat Fruit and Vegetables | .23 |
| Important to Maintain Healthy Weight | .37 | Important to Maintain Healthy Weight | .27 |
| Important to Not Smoke | .21 | Important to Not Smoke | .31 |
| Role Model: Exercise | .41 | Role Model: Exercise | .25 |
| Role Model: Not Smoking | .35 | Role Model: Not Smoking | .23 |
| Role Model: Fruit and Vegetables | .37 | Role Model: Fruit and Vegetables | .32 |
| Role Model: Healthy Weight | .44 | Role Model: Healthy Weight | .29 |

| (continued) **Appendix 4-2 Gamma Correlations: Perceived Expectations for Recommending Healthy Lifestyle Changes and Role Modeling Questionnaires** | | | |
|---|---|---|---|
| Patient Education: Diet | | Patient Education: Sleep | |
| Role Model: Teaching Tool | .43 | Role Model: Teaching Tool | .37 |
| Important to Practice What They Preach | .38 | Important to Practice What They Preach | .25 |
| Important to Perform Exercise | .46 | Important to Perform Exercise | .23 |
| Important to Eat Fruit and Vegetables | .43 | Important to Eat Fruit and Vegetables | .27 |
| Important to Maintain Healthy Weight | .35 | Important to Maintain Healthy Weight | .26 |
| Important to Not Smoke | .33 | Important to Not Smoke | .27 |
| Role Model: Exercise | .37 | Role Model: Exercise | .22 |
| Role Model: Not Smoking | .42 | Role Model: Not Smoking | .26 |
| Role Model: Fruit and Vegetables | .47 | Role Model: Fruit and Vegetables | .33 |
| Role Model: Healthy Weight | .39 | Role Model: Healthy Weight | .33 |
| Patient Education: No Tobacco | | | |
| Role Model: Teaching Tool | .39 | | |
| Important to Practice What They Preach | .36 | | |
| Important to Perform Exercise | .31 | | |
| Important to Eat Fruit and Vegetables | .23 | | |
| Important to Maintain Healthy Weight | .23 | | |
| Important to Not Smoke | .41 | | |
| Role Model: Exercise | .36 | | |
| Role Model: Not Smoking | .49 | | |
| Role Model: Fruit and Vegetables | .29 | | |
| Role Model: Healthy Weight | .26 | | |

Number of Students Recruited
N 1127

**Figures**

**Figure 1**



**Tables**

| Table 1: Demographic Characteristics | |
|---|---|
| Sex | Total % (n) |
| Male | 28.9 (96) |
| Female | 70.8 (238) |
| Prefer Not to Respond | 0.4 (1) |
| Age (years old) | Total % (n) |
| 18-25 | 47.3 (160) |
| 26-35 | 37.0 (122) |
| 36-45 | 8.9 (31) |
| 46 and older | 5.8 (19) |
| Prefer Not to Respond | 0.7 (2) |
| Race | Total % (n) |
| Caucasian / White | 80.8 (273) |
| African American / Black | 5.6 (18) |
| Hispanic / Latino | 5.4 (18) |
| Asian / Pacific Islander | 1.5 (5) |
| Native American | 1.4 (4) |
| Other | 0.7 (2) |
| More Than One Race | 2.7 (9) |
| Prefer Not to Respond | 1.5 (5) |

| Table 2: Perceived Expectations of Recommending Healthy Lifestyle Changes | |
|---|---|
| Provide Patient Education to: | % (n) of SPTAs Who Will Advise Often or Routinely |
| Meet daily physical activity guidelines | 76.4 (256) |
| Maintain healthy weight | 78.7 (263) |
| Eat healthy diet | 55.2 (185) |
| Decrease or stop the use of tobacco products | 77.9 (261) |
| Consume no > recommended amount of alcohol | 59.1 (198) |
| Perform stress management techniques | 61.8 (207) |
| Get recommended amount of sleep | 65.4 (219) |

| Table 3: Role Modeling Attitudes | |
|---|---|
| It is important for physical therapy professionals: | % (n) of SPTAs Who Agree or Strongly Agree |
| Role modeling is a powerful teaching tool | 95.5 (320) |
| To "practice what they preach" | 95.2 (319) |
| To be involved in CDC* recommended levels of regular physical activity | 92.2 (309) |
| To eat 5 or more servings of fruits and vegetables a day | 74.6 (249) |
| To maintain healthy weight | 91.9 (308) |
| To abstain from smoking | 94.3 (314) |
| To role model CDC* recommended levels of regular physical activity | 91.9 (308) |
| To role model nonsmoking behavior | 93.4 (312) |
| To role model eating 5 or more servings of fruits and vegetables a day | 71.6 (240) |
| To role model maintaining a healthy weight | 92.2 (308) |
| *CDC – Centers for Disease Control | |

| Table 4: Role Modeling Attitudes – Compared to Black et al. 2012 | | |
|---|---|---|
| It is important for physical therapy professionals: | % Who Agree or Strongly Agree | |
| | SPTA Results | Black et al, 2012 |
| Role modeling is a powerful teaching tool | 95.5 | 91.2 |
| To "practice what they preach" | 95.2 | 90.3 |
| To be involved in CDC* recommended levels of regular physical activity | 92.2 | 91.3 |
| To eat 5 or more servings of fruits and vegetables a day | 74.6 | 77.9 |
| To maintain healthy weight | 91.9 | 91.6 |
| To abstain from smoking | 94.3 | 92.1 |
| To role model CDC* recommended levels of regular physical activity | 91.9 | 87.6 |
| To role model nonsmoking behavior | 93.4 | 88.6 |
| To role model eating 5 or more servings of fruits and vegetables a day | 71.6 | 73.2 |
| To role model maintaining a healthy weight | 92.2 | 89.6 |
| *CDC – Centers for Disease Control | | |

| Table 5: Health Promoting Lifestyle Profile II (HPLPII) | | | |
|---|---|---|---|
| Domain | Mean* | Variance | SD |
| HPLPII Total Score | 2.90 | 0.175 | 0.42 |
| Health Responsibility | 2.55 | 0.305 | 0.55 |
| Physical Activity | 2.86 | 0.390 | 0.63 |
| Nutrition | 2.81 | 0.282 | 0.53 |
| Spiritual Growth | 3.29 | 0.230 | 0.48 |
| Interpersonal Relations | 3.20 | 0.237 | 0.49 |
| Stress Management | 2.65 | 0.309 | 0.56 |
| *1 = Never, 2 = Rarely, 3 = Often, 4 = Routinely | | | |

| Table 6: Physical Activity and Exercise Questions: Correlations | | | |
|---|---|---|---|
| Variables | | | $\gamma$ ($p<.001$) |
| Expectation: Patient Education – Exercise | RM Questionnaire | Important to Perform Exercise | 0.39 |
| | | Role Model Exercise | 0.46 |
| | | Teaching Tool | 0.51 |
| | | Practice What They Preach | 0.45 |
| | | Role Model Not Smoking | 0.43 |
| | | Role Model Fruit and Vegetables | 0.38 |
| | | Role Model Healthy Weight | 0.39 |
| | | Important to Eat Fruit and Vegetables | 0.32 |
| | | Important to Maintain Healthy Weight | 0.34 |
| | | Important to Not Smoke | 0.35 |
| | HPLPII | Total Score | 0.39 |
| | | Physical Activity | 0.42 |
| | | Nutrition | 0.34 |
| | | Spiritual Growth | 0.31 |

| Table 7: Weight Questions: Correlations | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Weight | RM Questionnaire | Important to Maintain Healthy Weight | 0.37 |
| | | Role Model Healthy Weight | 0.44 |
| | | Practice What They Preach | 0.45 |
| | | Teaching Tool | 0.54 |
| | | Important to Perform Exercise | 0.47 |
| | | Role Model Exercise | 0.41 |
| | | Important to Eat Fruit and Vegetables | 0.32 |
| | | Role Model: Not Smoking | 0.35 |
| | | Role Model: Fruit and Vegetables | 0.37 |
| | HPLPII | Total Score | 0.38 |
| | | Nutrition | 0.34 |
| | | Spiritual Growth | 0.38 |

| Table 8: Diet and Nutrition Questions: Correlations | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Diet | RM Questionnaire | Important to Eat Fruit and Vegetables | 0.43 |
| | | Role Model Eating Fruit and Vegetables | 0.47 |
| | | HPLPII Nutrition | 0.46 |
| | | Teaching Tool | 0.43 |
| | | Practice What They Preach | 0.38 |
| | | Important to Perform Exercise | 0.46 |
| | | Role Model Exercise | 0.37 |
| | | Important to Maintain Healthy Weight | 0.35 |
| | | Role Model Healthy Weight | 0.39 |
| | | Important to Not Smoke | 0.33 |
| | | Role Model: Not Smoking | 0.42 |
| | HPLPII | Total Score | 0.36 |
| | | Nutrition | 0.46 |
| | | Spiritual Growth | 0.30 |

| Table 9: Tobacco Questions: Correlations | | | |
|---|---|---|---|
| Variables | | | γ (p<.001) |
| Expectation: Patient Education – Tobacco | RM Questionnaire | Important not to Use Tobacco | 0.41 |
| | | Role Model Not Using Tobacco | 0.49 |
| | | Teaching Tool | 0.39 |
| | | Practice What They Preach | 0.36 |
| | | Important to Perform Exercise | 0.31 |
| | | Role Model: Exercise | 0.36 |

| Table 10: One-Sample Chi-Square Test |
|---|
| Null Hypothesis* |
| The categories of Patient Education: Exercise occur with equal probabilities. |
| The categories of Patient Education: Weight occur with equal probabilities. |
| The categories of Patient Education: Diet occur with equal probabilities. |
| The categories of Patient Education: No Tobacco occur with equal probabilities. |
| The categories of Patient Education: Alcohol occur with equal probabilities. |
| The categories of Patient Education: Stress Management occur with equal probabilities. |
| The categories of Patient Education: Sleep occur with equal probabilities. |
| The categories of Role Model: Teaching Tool occur with equal probabilities. |
| The categories of Role Model: Practice What They Preach occur with equal probabilities. |
| The categories of Important to Perform Exercise occur with equal probabilities. |
| The categories of Important to Eat Fruit and Vegetables occur with equal probabilities. |
| The categories of Important to Maintain Healthy Weight occur with equal probabilities. |
| The categories of Important to Not Smoke occur with equal probabilities. |
| The categories of Role Model: Exercise occur with equal probabilities. |
| The categories of Role Model: Not Smoking occur with equal probabilities. |
| The categories of Role Model: Fruit and Vegetables occur with equal probabilities. |
| The categories of Role Model: Healthy Weight occur with equal probabilities. |
| The categories of Age occur with equal probabilities. |
| The categories of Sex occur with equal probabilities. |
| The categories of Race occur with equal probabilities. |
| Asymptotic significances are displayed.<br>*The significance level is .000 for decision to reject the null hypothesis |

| Table 11: One-Sample Kolmogorov-Smirnov (K-S) Test | | | |
|---|---|---|---|
| HLPII Sub-Score[1] | Mean | SD | Decision |
| HLPII Total Score | 2.90 | 0.419 | Reject the null hypothesis |
| Health Responsibility | 2.55 | 0.522 | Reject the null hypothesis |
| Physical Activity | 2.86 | 0.625 | Reject the null hypothesis |
| Nutrition | 2.81 | 0.531 | Reject the null hypothesis |
| Spiritual Growth | 3.29 | 0.480 | Reject the null hypothesis |
| Interpersonal Relations | 3.20 | 0.487 | Reject the null hypothesis |
| Stress Management | 2.65 | 0.556 | Reject the null hypothesis |
| Asymptotic significances are displayed. [1]The significance level is .000 for decision reject the null hypothesis, Lillifors Corrected | | | |