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# Exercise Is Medicine: The Exercise Habits and Attitudes Towards Exercise Counseling of Medical Practitioners

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*Eastern Illinois University*

This research is a product of the graduate program in [Kinesiology and Sports Studies](#) at Eastern Illinois University. [Find out more](#) about the program.

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EXERCISE IS MEDICINE: THE EXERCISE HABITS AND ATTITUDES  
TOWARDS EXERCISE COUNSELING OF MEDICAL PRACTITIONERS

(TITLE)

BY

ZOË ROBERTS

**THESIS**

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF  
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IN THE GRADUATE SCHOOL, EASTERN ILLINOIS UNIVERSITY  
CHARLESTON, ILLINOIS

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exercise counseling of medical practitioners

By

Zoë Roberts

Kinesiology and Sports Studies

Eastern Illinois University

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Zoë Roberts

### **Abstract**

The purpose of this research was to examine the exercise habits of practicing physicians, physician assistants (PA), and nurse practitioners (NP) in Illinois to better understand their attitudes towards counseling their patients on exercise, and to analyze the frequency that these health care providers incorporate exercise counseling into their practices. Current data has revealed the exercise habits of physicians and how it has influenced the physicians' exercise counseling behaviors. But PAs and NPs have not been included in research collectively as a medical team on the topic using exercise counseling and prescription for patient care and treatment. The research was conducted at a Midwestern hospital where physicians, PAs, and NPs employed in Illinois were invited to participate in the survey. There were 25 participants who answered up to 49 questions through the online survey program, Qualtrics. SPSS software was used to analyze the 25 responses on their exercise activity and attitudes towards exercise counseling to evaluate if the subjects were meeting the ACSM's recommendations for aerobic and muscular fitness and how their exercise habits might influence their exercise counseling practices. The participants' responses did yield a mean indicating that the medical care providers had a favorable attitude towards exercise counseling and its importance in patient care and treatment. Therefore, recommendations have been made that could guide future research on the health and practices of physicians, PAs, and NPs regarding exercise and exercise counseling.

### **Dedication**

Without a doubt, I am very grateful for the opportunity to have received a Masters of Kinesiology in Exercise Science from Eastern Illinois University. I would not have been able to flourish in my studies and responsibilities as a graduate student and graduate assistant this past year without the help and guidance from my teachers, mentors, and family. They constantly provided encouragement and support through every challenge and success of my program. I would also like to thank my graduate assistant supervisors Stacey Ruholl, Maranda Schaljo and Brianne Breidenbach along with my department chair, Mark Kattenbraker, for giving me the opportunity to flourish as a growing health professional in the Adult Fitness Program and Kinesiology and Sports Studies Department. Because of their help throughout this process, I dedicate my finished product to my supervisors, teachers, mentors, and family.

### **Acknowledgement**

It would not have been possible to complete my thesis research without the help and guidance of my Thesis Advisor, Dr. Stacey Ruholl. Dr. Ruholl has continually pushed my limits not only as a researcher, but as a writer and I would like to thank her for challenging me to grow both as a researcher and as a student of kinesiology and exercise science. I would also like to thank my thesis committee members, Dr. Jake Emmett and Dr. Jeffrey Stowell, for the help and guidance with my research and writing. It is with your guidance that I have been able to finish both my graduate program and thesis research well.



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## CHAPTER I

### Introduction

American adults are less active than generations past due to the continuous developments in American culture altering family, job, and individual lifestyles with increased physical inactivity and sedentary behaviors, resulting in one of the greatest health problems of the 21<sup>st</sup> century. These changes, often the results of progressive technological developments, has made day-to-day life become vastly different than the activities of generations past. The American College of Sports Medicine (2014) defines physical activity as “any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure” while exercise is classified as “a type of physical activity consisting of planned, structured, and repetitive bodily movement done to improve and/or maintain one or more components of physical fitness” (p. 2). Therefore, the result is that often American adults are less active and not expending as much energy as would be required to be defined as being “physically active” individuals, and the justification to exercise has not even been addressed yet.

The Physical Activity Guidelines (PAG) for Americans (2008) recommends exercising for 30-60 minutes of moderate exercise for 5 days/week for a goal of 150 minutes or more of moderate intensity exercise, 20-60 minutes of intense exercise for 3 days/week to achieve the recommended 75 minutes of vigorous intensity exercise, or a combination of moderate and vigorous exercise to receive significant health benefits from the activity. The recommendation can be met by performing moderate-vigorous exercise for the equivalent of 500-1,000 metabolic equivalent per week (MET-min/week). According to the PAG for Americans (2008), only 31% of American adults met the guidelines in 2005 which means that less than one third of

American's were meeting the criteria for being considered as physically active, while 69% of Americans are not meeting the criteria.

Gates (2016) stresses that the lack of physical activity among Americans has become a major health concern, therefore she suggests that research on the major health implications of sedentary lifestyles is of utmost importance, along with exercise education and prescription. In *The green prescription study: A randomized controlled trial of written exercise advice provided by general practitioner* (Swinburn, Walter, Arroll, Tilyard, & Russel, 1998), a strong correlation is seen between physical inactivity and an increased risk of morbidity among adults, such as developing a cardiovascular disease (CVD), pulmonary disease, and/or metabolic disease along with many other health complications. Lees and Booth (2004) emphasize how sedentary death syndrome, unhealthy conditions brought about from sedentary lifestyles, has become a major public burden as it hastens the development of diseases and causes millions of premature and preventable deaths each year.

In *The National Physical Activity Plan: A Call to Action* from the American Heart Association (AHA), the AHA recognizes physical inactivity as “a major threat to cardiovascular health” and affirms the major implications physical inactivity has on one's health such as increasing the risks of morbidity and mortality (Kraus et al., 2015, p. 1932). The American College of Sports Medicine (ACSM) considers sedentary lifestyles as one of the major but modifiable risk factor for CVD. Like with the risk factor of smoking, changes can be implemented for those with sedentary lifestyles to reduce such behaviors by increasing physical activity with the hopes of eliminating the risk factor all together. Such consequences of physical inactive lifestyles include the following: a 30% increased risk of hypertension, 45% increased risk of coronary artery disease, 59% increased risk of osteoporosis, 60% increased risk of a

stroke, and increased risk of 25 chronic diseases (Booth, Gordon, Carlson, & Hamilton, 2000; Kraus et. al., 2015).

The U.S Department of Health and Human Services (2008) highlights other risk factors associated with physical inactivity like the increased risk of malignant neoplasm that can become cancerous and lead to the growth of tumors. This low physical activity pandemic is responsible for a staggering 334,000 deaths in the United States each year (Kraus et al., 2015, p. 1932) and is quickly becoming a major concern for people around the world as the fourth leading cause of death worldwide resulting in annual report of 5 million deaths (Booth et. al., 2000; Pate, O'Neill, & Lobelo, 2008). Doctors are now having to deal with the burden of diseases that could have been prevented if physical activity and exercise had been encouraged and incorporated more into patients' lives, leading to the subject of exercise prescription (Gates, 2015).

One of The World Health Organization's (WHO) (2014) goals for their *Global action plan for the prevention and control of NCDs 2013-2020* is to reduce insufficient physical activity by 10% by 2020. This can be done through medical care providers incorporating exercise prescription into their practices.

Therefore, the result of this pandemic has spurred on continuous research into the importance of doctors prescribing exercise to their patients as a new era of exercise as medicine ushers into the health and wellness industry. In *Training tomorrow's doctors in exercise medicine, for tomorrow's patients* (2015), Gates stresses the importance for current doctors to be prescribing exercise, like medication, to their patients since physical activity produces health benefits, improves health status, and can increase quality of life for those who exercise compared to their sedentary counterparts (Naci & Ioannidis, 2013). Because of this, health care providers, especially medical students, need to be adequately educated and trained in prescribing exercise to

patients so that that they are “confident, competent, and capable of safe and effective physical activity advice” in order to confront the burdens of the diseases and health problems resulting from sedentary lifestyles (Gates, 2015, p. 4)

In 2007, the ACSM founded the Exercise is Medicine (EIM) campaign with the goal of addressing the need of physicians prescribing exercise, like other medications, to their patients as a form of treatment. EIM’s mission as a global health initiative is to “encourage primary care physicians and other health care providers to included physical activity when designing treatment plans for patients and referring patient to EIM Credentialed Exercise Programs and Exercise Professionals” (Exercise is Medicine, n.d., para. 1). The ACSM’s EIM initiative is firmly established on the belief that “physical activity is integral in the prevention and treatments of diseases” and that healthcare, which would include physicians, PAs, and NPs, should incorporate the encouragement and prescription of physical activity in health assessments and treatment plans for patients (Exercise is Medicine, n.d., para. 1)

By nature, physicians, PAs, and NPs have numerous interactions with a wide range of patients throughout their day, allowing them the potential to have an influential voice in their patients’ lives and incorporate EIM strategies into their practices. These medical practitioners can become not only effective educators in the health care system, but also be role models of health and wellness to their patients, especially if they are pursuing healthy lifestyles and behaviors themselves. Unfortunately, not all physicians are pursuing active lifestyles themselves nor are familiar with the EIM initiative. Gates (2016) reported that the way in which a physician regards physical activity and exercise can influence his or her attitude towards prescribing exercise as medicine to the physician’s patients. This would also include PAs and NPs who have multiple interactions with patients in consultation settings.



The problem with exercise counseling and exercise prescription among health care providers arises when some health professionals may not fully appreciate or understand physical inactivity implications. Therefore, exposure to health strategies like the EIM initiative along extensive exercise counseling and training in medical schools are needed to equip and aid the health care providers' counseling on exercise and their own physical activity habits.

In Gnanendran et al., (2011), 85% of medical students, general practitioners, and sports specialists who were meeting the NAPA guidelines for aerobic exercise, reported positive attitudes toward exercise counseling and agreed that it should be included within patient care and consultations. Participants who exercised had more positive attitudes about counseling on exercise and the benefits of pursuing physically active lifestyles compared to participants who did not exercise or who had lower attitudes towards exercise counseling. Therefore, research needs to analyze how many physicians, PAs, and NPs are currently meeting the ACSM's guidelines for aerobic and muscular fitness and how their personal exercise habits influence their practices. Research needs to find if the physical activity habits, or lack of physical activity, of physicians, PAs, and NPs, influences their attitudes and practice of prescribing exercise to patients.

This study examined current practicing physicians', PAs', and NPs' attitudes towards exercise and the value they place on exercise counseling and prescription. The null hypothesis was that most physicians, PAs, and NPs are not meeting the ACSM's recommended amount of aerobic (cardiovascular endurance) exercise as at least 30-60 minutes of moderate exercise for at least 5 days a week to achieve the recommended 150 minutes (500 MET-min/week) or 20-60 minutes of intense exercise 3 days a week to achieve the recommended 75 minutes (>1000 MET-min/week). The second null hypothesis is that most physicians, PAs, and NPs are not meeting the

ACSM's recommended amount of muscular fitness training, which is resistance training each major muscle group of the body 2-3 days a week. In the current study, physicians, PAs, and NPs were chosen to be measured on their self-reported physical activity and exercise habits in comparison to the ASCM's recommended aerobic and muscular exercise

### **Purpose of the Study**

Therefore, the purpose of this study is to evaluate the exercise and physical activity habits of physicians, PAs, and NPs and their attitudes towards counseling and prescribing exercise to their patients as preventative medicine.

### **Research Questions**

The following questions were used to guide this study in analyzing the medical practitioners' attitudes and behaviors towards exercise counseling and prescription. This research addressed the following questions:

1. How many physicians, physician assistants, and nurse practitioners are currently meeting the ACSM guidelines for aerobic and muscular fitness collectively?
2. How many and how often do physicians, physician assistants, and nurse practitioners discuss physical activity habits with their patients?
3. What are the attitudes and beliefs of physicians, physician assistants, and nurse practitioners towards exercise counseling as preventative medicine?

### **Significance of Study**

This study is important due to the need for health care providers to be familiar and supportive with the EIM and for them to encourage and prescribe exercise to their patients. Physical activity and exercise has decreased among American adults while diseases and conditions from sedentary lifestyles have increased across the nation. If health care providers,

like physicians, PAs, or NPs, have positive attitudes towards exercise counseling, and pursue exercise themselves, they might have a greater ability to influence their patients to exercise and adhere to active and healthy lifestyle behaviors. Also of importance are the health care providers' own adherence to aerobic and muscular exercise for their own health and decreased risk of morbidity.

### **Limitation & Delimitations**

Limitations of this study include:

- 1.) Subjects volunteered to participate in the study.
- 2.) Only medical care providers from one Mid-West hospital participated in this research.
- 3.) On medical care providers interested in this study participated in the survey.
- 4.) The study was administered at one hospital in a Mid-West rural community.

Delimitations include:

- 1.) The researcher indirectly and directly recruited subjects for this research by directly e-mailing participants as well as utilizing a human resource provider from a Mid-West hospital to recruit subjects. Therefore, recruitment could have been limited due to how the participants were contacted either by the researcher or the human resource provider.
- 2.) This study only reached out to hospitals and medical organization in Illinois.
- 3.) Only practicing physicians, physician assistants, and nurse practitioners employed at hospitals in Illinois were recruited for this study.
- 4.) The participants in this study were individually selected by the researcher prior to being recruited.
- 5.) The research survey was only administered via e-mail to participants.

- 6.) Participants completed the research questionnaire through an online survey software.
- 7.) The online survey was activated for only two months for the participants to complete.
- 8.) Collection of data was limited to two months.

### **Definition of Terms**

1. ACSM's recommendation for cardiorespiratory fitness: moderate exercise 5x/week for 30-60 minutes or vigorous exercise 3x/week for 20-60 minutes.
2. Exercise: a type of physical activity consisting of planned, structured, and repetitive bodily movement done to improve and/or maintain one or more components of physical fitness.
3. Exercise counseling: discussing the physical activity practices of patients as well as educating them in the benefits and variety of exercise.
4. Exercise is medicine: prescribing exercise to patients to improve health and for the prevention and treatment of diseases
5. Physical activity: any bodily movement produced by the contraction of skeletal muscles that results in a substantial increase in caloric requirements over resting energy expenditure.
6. Preventative medicine: a practice or substance used to prevent the development of a certain disease or diseases.
7. Metabolic equivalent (MET): the calculation of the metabolic energy expended when resting and/or when active.
8. 1 MET: the energy expending to burn 1 calorie per kilogram of body weight in one hour (1kcal/kg/hour) often to equivalent to sitting quietly without much bodily movement.
9. Recommended MET-min/week for physical activity: 500METmin/week

10. Recommended MET-min/week for moderate-vigorous exercise: 500-1000METmin/week
11. Morbidity – diseases that include cardiovascular, metabolic, and pulmonary diseases.

## CHAPTER II

### Literature Review

This chapter contains a review of current research on the physical activity and exercise habits of medical practitioners, both those in training and currently practicing physicians. An analysis also covered which types of physicians are more active based upon their age, specialty of practice, and hours worked per week. This chapter also addresses how the medical practitioner's personal lifestyles habits, physically active or not, can predict the physician's likelihood of counseling their patients on exercise and influence his or her attitude and confidence of counseling on exercise.

#### Physicians' Exercise and Physical Activity Habits

For more than 30 years, researchers have analyzed the lifestyle habits of medical care physicians, specifically regarding their exercise and physical activity habits. According to the Association of American Medical Colleges' (AAMC) diagram of *The Road to Becoming a Doctor*, the education and professional journey for a medical practitioner can be long and strenuous, starting with pre-med education, advancing into medical school, and concluding with residency and fellowship training, all that can last 10 or more years. Physicians continue their education even after completion of their training through attending seminars and other medical education events to renew certifications and licensures.

As one might assume, the stages of medical training can lead to little time and energy for exercise and are often accompanied by stress and high burn-out rates. Because of this, the ability for practicing and in-training physicians to pursue healthy lifestyles can be challenging and often filled with many barriers regarding time, energy, and desire to exercise (Howe, Leidel, Krishnan, Weber Rubenfire, & Jackson, 2010; Stanford, Durkin, Blair, Powell, Poston, & Stallworth,

2011). Yet pursuing regular source of care (RSOC), like exercise and physical activity, is a vital aspect for the health of a physician and can play an influential role in the physician's attitude towards exercise by dictating how he or she will extend recommendations and counseling on exercise to the his or her patients (Gross, Mead, Ford, & Klag, 2000). This includes PAs and NPs who also have strenuous training and clinical rotations to become health care providers too.

Physicians have a prime opportunity to advise their patients on the benefits of exercise, such as its role in preventative medicine such as decreasing the development of hypertension and diabetes, as well as being used for treatment for some diseases, like sarcopenia and CVD (ACSM, 2011). Even though physicians can influence their patients on the health benefits of exercise, many physicians do not provide their patients with advice on physical activity, nor do they counsel them on proper and effective exercise routines (Lobelo et al., 2009). Research by Podl, Goodwin, Kikano, & Stange (1999) indicated that out of the 138 family care physicians surveyed, only 21% of physicians were directly observed consulting their patients on exercise while only 13% of patients self-reported receiving exercise counseling. These results imply that many patients were not receiving advice on exercise and how the practice of exercise can be used to address certain risks and diseases.

Research shows that physicians who participate in exercise are more inclined to have a favorable attitude towards using exercise counseling within their practices (Abramson et al., 2000; Gnanendran et al., 2011). Lack of exercise counseling by physicians could be due to their poor attitudes towards exercising all together. Therefore, for exercise counseling to be effective in improving American adults' physical activity and health, health care providers need to be as serious about their own health and exercise.

**Are physicians meeting exercise recommendations?**

How active are these health promoting and disease fighting professionals? According to Abramson et al. (2000), many of the 1,200 primary care physicians analyzed within their study were not meeting the recommendation of the Surgeon General for aerobic exercise, specifically in accordance to the duration and intensity of aerobic exercise. The study did reveal that for those who were exercising, 73% were participating in aerobic exercise as compared to strength training emphasizing how aerobic exercise is often the most pursued form of fitness when compared to muscular strength, muscular endurance, and flexibility fitness. This could be due to the numerous cardiovascular and cardiorespiratory benefits of aerobic exercise. Long et al. (1996) found that “female physicians were equally likely to perform exercise as male physicians, but were less likely to perform strength training exercise” which shows the prevalence of aerobic exercise among those who are physically active.

In a recent Australian study by Gnanendra, Pyne, Fallon, & Frickler (2011), 173 medical students, clinicians, and sports scientists from the Australian National University (ANU) Medical School and the Australian Institute of Sport (AIS) were surveyed on their exercise habits according to the National Australian’s Physical Activity (NAPA) guidelines and their attitudes towards exercise counseling. Like the ACSM’s guidelines for aerobic exercise (2013), The Australian Government Department of Health’s NAPA guidelines (2014) suggest 30 minutes of moderate to vigorous exercise for 3-5 days a week, or for most days of the week.

Gnanendran et al. (2011) found that 88% of participants self-reported that they were participating in some sort of exercise but that only 70% of those exercising were meeting the NAPA guidelines for aerobic exercise. Out of the 173 participants, only 60% were happy with their physical activity levels while 40% were unhappy (Gnanendran et al., 2011). Of the latter



group, 34% reported that they did not view exercise as important, thus affecting their attitudes towards exercise counseling and prescription. The study's main findings were that a doctor's own personal physical activity habits along with his or her attitudes towards exercise and their exposure towards the campaign of using exercise as medicine will greatly influence his or her view and practice of exercise counseling (Gnanendra et al., 2011).

### **Authenticity and Attitude in Exercise Counseling**

The attitudes of general practitioners towards exercise and exercise counseling can have influential effects on their actual exercise counseling and prescription practices (Gnanendra et al., 2011). Counseling on exercise is vital for patient care and treatment since most patients regard their physicians, especially primary care physicians, as one of the top sources to seek for health and wellness information and education. According to Long et al. (1996), the average adult makes at least 2.7 visits to a physician each year and that, at the time of their research, 80% of Americans considered their physician as their primary source of information about health, including fitness and wellness.

For primary care physicians who treated patients with chronic kidney disease (CKD), a significant association was seen between the frequency of physicians' physical activity and exercise and the amount of CKD patients who received recommendations to exercise (Morishita et al., 2014). It was also noted that for the physicians who exercised more frequently than their counterparts, they were more likely to have their CKD patients to exercise more days a week, therefore prescribing a higher frequency of exercise patients (Morishita et al., (2014). In Frank, Rothenberg, Lewis, & Belodoff (2000), the female family practice physicians who valued healthy lifestyle behaviors and pursued physical activity reported more prevention-related counseling, like exercise counseling, into their practices. Therefore, physicians, PAs, and NPs

should be encouraged to be physically active and develop personal health habits so that they be an authentic example to their patients and be more inclined counsel on the benefits of exercise and prescribe exercise to their patients.

The type of exercise a physician participates in is a strong indicator of how he or she might counsel his or her patients regarding exercise selection. In Abramson, Stein, Schaufele, Frates, & Rogan (2000), their research revealed that the physicians who were currently participating in aerobic exercise were 95% more likely to counsel on the benefits of exercise as compared to physicians who were not exercising at all, consequently counseling their patients less on the benefits of exercise. They also found that most physicians who exercised anticipated in aerobic training, as compared to resistance training. Long et al. (1996, p77-80) stated “female physicians were equally likely to perform exercise as male physicians, but were less likely to perform strength training exercises” suggesting that aerobic exercise is the more preferred type of fitness of health care providers. Because of this, health care providers are more likely to counsel and prescribe aerobic exercise to their patients when they are performing aerobic exercise regularly themselves (Abramson et al., 2000; Frank et al., 2000; Long et al. 1996).

Gnanendra et al. (2011) found that the medical and sports specialist participants in their study had positive attitudes towards exercise counseling but that the general practitioners in the study only sometimes discussed physical activity with their patients. Wells, Lewis, Leake, & Ware (1984) noted that physicians counseled on exercise more aggressively and towards a wider range of patients when they have better personal health habits and more positive attitudes towards counseling on exercise themselves.

Evidently, physicians will “preach” more on healthy lifestyle behaviors when they are “practicing what they preach” to begin with. Therefore, “practice what you preach” can have

positive benefits for exercise adherence for patients if they are seeing their physician pursue physical activity and health behaviors. Yet there can be problems when general practitioners believing that they are incorporating exercise counseling within their practices but are not truly counseling their patients to exercise and be more physically active, let alone prescribe their patients specific exercises to follow (like aerobic exercise or resistance training exercise).

Gnanendra et al. stressed that exercise counseling is considered successful when reported successfully by a patient (2011) which can be enhanced by active and healthy practitioners first.

### **Exercise is Medicine**

The result of health care providers having more favorable attitudes towards the benefits of exercise for improving their patients' health could increase their participation in exercise prescription campaigns, like the ACSM's Exercise is Medicine (EIM) Global Health Initiative. The purpose of the EIM initiative is to have physicians and exercise professionals partner together in the promotion of optimal patient care through the use of exercise prescription (Exercise is Medicine, n.d.).

EIM takes place in the health care system when physicians and exercise professionals, like an exercise physiologist or exercise specialist, work as a team and advocate to improve patients' lives through improving patient's health and wellness along with treating a health condition. This takes place by a physician filling out a prescription to his or her patient to exercise which would then refer the patient to an EIM credential exercise professional who would create an exercise program that meets the patient's needs and monitor the patient throughout his or her time in the program. The patient would incorporate the exercise routine into his or her life just like any other medication and participate in the prescribed exercise program for a specific period of time. The goal of EIM is to have physicians, exercise

professionals and patients work together to not only treat patients' conditions, but improve their health and wellbeing through specifically prescribed exercise, ideally incorporating exercise and physically activity in into their lifestyles for the rest of their lives (Exercise is Medicine, n.d.).

In *Another Look at "Exercise is Medicine"*, Hochstetler argues that the EIM aim primarily focuses on the health-related benefits of exercise, like lowering blood pressure and weight loss, then trying to make individuals passionate about activity or enjoying exercise (2014). Therefore, health and exercise professionals should be mindful of educating and encouraging patients on both the physiological impacts of exercise, like improving the cardiovascular and cardiorespiratory system, and the psychological impacts, like improved self-esteem and mental well-being. Then, when patients have completed their prescribed exercise sessions, they could be more likely to adhere to an active lifestyle when valuing both the physiological and psychological benefits of exercise.

The result of the implementation of the EIM program among medical practitioners can greatly increase the improvement of patients' overall health, encourage physicians and patients to value the benefits of exercise, and to improve the health care system by bringing exercise advocates together. Providing the additional resource of EIM to physicians, exercise professions, and health educators can be a foundational asset to patient care and treatment in clinics, hospitals, and exercise and health programs across the nation.

### **Stage of Careers Influence on Exercise Counseling**

Not only do physicians' practices influence their lifestyle choices, but also the stage of the physicians' medical career can affect their physical activity habits. In a study by Howe et al. (2010), only 9.8% of trainee physicians, those soon to become physicians, and 39.5% of

attending physicians, those currently practicing, self-reported exercising at least four days per week while only 7.8% of trainees and 25.8% of attending physicians met the guidelines for aerobic exercise of 150 minutes of aerobic exercise per week.

Standford et al. (2011), conducted a national survey of medical care providers in the United States where physicians were placed into four categories depicting the different stages of their careers varying from those receiving their education to doctors who had been practicing for many years. The self-reported exercise survey revealed that out of the 1949 participants, 84% of medical students and 84.8% of attending physicians were meeting the U.S. Department of Health and Human Services (USDHHS) Physical Activity Guidelines (PAG) while only 73.2% of resident physicians and 67.9% of fellow physicians met the PAG. It is assumed that these findings might be similar for physician assistants and nurse practitioners and how the stage of their training and/or career influences their activity levels.

In Long et al. (1996), the physicians who were counseling on exercise, specifically aerobic exercise, revealed a mean age that was much younger than the physicians who were incorporating exercise counseling into their practices. Younger medical practitioners had more positive attitudes towards exercise counseling than older ones who had been practicing for many years. These younger and soon to be physicians were establishing and refining their practices amid the wave of Exercise is Medicine from ACSM (2011) and other programs, such as the Washington State Medical Association (WSMA) Healthy Doctors Healthier Patients Campaign (2016), and Healthy Doc = Healthy Patients Campaign, which all aim to emphasize the benefits of exercise for all aspects of the body; heart health, cognitive functioning, aging well, etc. (ACSM, 2011; Clark et al., 2005; Lobelo, Duperly, & Frank, 2009; Peters, R., 2005). As previously mentioned, the ACSM's EIM initiative is to encourage physicians to incorporate

exercise counseling into their practices by prescribing exercise to their patients to improve health and for the prevention and treatment of diseases (ACSM, 2007).

### **Barriers to Exercise Counseling**

Inadequate time, inadequate knowledge or experience, and patient disinterest or noncompliance with counseling are some of the most common barriers that physicians face with incorporating exercise counseling within their practices (Long et al., 1996). One of the most prominent barriers for physicians to counsel on exercise to their patients is having adequate time during the consultations themselves. Many physicians face the problem of having limited time to educate their patients on the benefits of exercise, let alone properly prescribe specific exercises to their patients (Abramson, et al. 2000; Howe et al., 2010). In Howe, Lediel, Krishnan, Weber, Rubenfire, & Jackson (2010), most of the 183 physicians and physicians-in-training surveyed in their study reported having less than five minutes per visit to counsel patients on healthy habits, such as diet and exercise. Abramson et al. (2000) also found that the number one barrier for physicians regarding counseling on exercise was having inadequate time during patient appointments.

As previously addressed, poor attitudes from health care providers towards exercise counseling is a setback of the incorporation of exercise counseling and prescription among patient care consultation and can extend over to the physicians' PAs and NPs and negatively influence their attitudes to this practice. Medical practitioners are already fighting for adequate time during consultations to address their patients' needs and with the addition of negative attitudes towards exercise counseling, they could limit the incorporation of EIM practices even more among their practices.

For practicing physicians who do have positive attitudes towards exercise, they might be unable to exercise themselves because of the long work hours many health care providers face within their practices (Standford et al., 2011). Longer work hours have been correlated with higher BMIs in attending physicians as well as for trainee physicians (Standford et al., 2011). Similar findings would be expected to be seen in training and practicing PAs and NPs too. For those physicians-in-training, along with other medical care providers in training, for their future positions, long work and study hours can limit the time they have available to be physical active and exercise. These in-training health care providers tend to be the most supportive towards the education and benefits of exercise but can face more barriers to exercise than their patients (Howe et al., 2010).

Another prominent barrier medical care providers face is inadequate education on exercise counseling and the benefits of exercise. Williford, Barfield, Lazenby, & Olson (1992) found that the major barrier that physicians were encountering regarding exercise counseling began with the lack of training they received in medical school. This also carried over into the physicians' residency training on the benefits of physical activity, the lack of reimbursement for prescribing exercise, and unfamiliarity of referral exercise programs and/or exercise specialists for their patients.

### **Preparing Future Physicians**

The National Health Interview Survey (2010) showed an increase from 22.6% in 2000 to 32.4% in 2010 in patients receiving exercise counseling from their physicians. In Barnes & Schoenborn's *Trends in adults receiving a recommendation for exercise or other physical activity from a physician or other health professional* (2012), they affirmed the increase in the recommendation of physical activity and exercise among the medical community in the last 10

years but stressed how less than half of U.S. adults were receiving this advice from their physicians at the time.

Though the number of U.S. adults receiving exercise counseling from their physicians has increased, many patients still do not receive adequate advice and encouragement to exercise for their current condition or to prevent specific health conditions. Physicians need education on exercise counseling and prescription in medical school. They should also seek continuing education on exercise counseling throughout their careers. Primary care physicians encounter wide populations of patients so they especially need to receive proper education and training on how to prescribe exercise and counsel their patients to exercise (Long et al., 1996). This would also include PAs and NPs along with all future medical care providers.

Medical students report having positive attitudes towards exercise counseling with a principal understanding of its relevance to patient care. Yet, they are still encountering such barriers as having little exposure to education on exercise prescription and counseling within their medical school curriculum, as well as having little time to pursue exercise themselves due to the intensity of their curriculums. As discovered by Rogers, Bailey, Gutin, et al. (2002), various factors contribute to and predict the likelihood of a physician, to counsel on exercise. This would include increasing future physicians' confidence in exercise prescription and their perception of the importance of exercise counseling within consultations too.

According to Frank, Tong, Lobelo, Carrera & Duperly (2008), many medical students carried over their physical activity habits and health practices into medical school but few were establishing and enhancing their personal health practices upon an educational foundation that could have been provided in medical school. Therefore, the students' medical school curriculum



was not encouraging a healthy atmosphere to help encourage and influence the students to pursue personal health practices during their education, like becoming more physically active.

It was also reported that students were entering medical school with more positive attitudes towards the relevance of exercise counseling than students in their last year of medical school (Frank et al., 2008). Of the 1658 medical students surveyed in their research, only 61% of them complied with the CDC's recommendations for physical activity. This report is higher than the national estimate that only 57% of the general population of American adults in their age category were meeting the CDC's PA recommendations (Frank et al., 2008). Yet as students progressed through their studies from freshman year to senior year of medical school, the study reported a slight but insignificant drop in medical student meeting the PA recommendations. This of course, indicates that some of the medical students were becoming less physically active at the end of medical school than compared to when they began their medical school studies (2008).

### **Barriers to Exercise Counseling Education & Training**

Barriers that these physicians in training might be facing through their education can limit their ability to pursue physically active lifestyles. The amount of stress from medical school can also play an influential role in the physical activity habits of medical students. Students with higher short-term and long-term stress exercised less than their counterparts, which resulted in an inverse relationship between physical and mental health (Frank et al., 2008). This finding is important because medical students' mental health is as significant as their physical health and can both influence roles in the physicians' future practices.

According to Lewis et al. (1999), more medical school programs need to promote health activities for future health care providers. Because of this, there is a great demand for medical schools to implement interventions to help students deal with stress and improve their mental well-being through increased physical activity. Physical activity interventions will not only help medical students' immediate health, but also can encourage and establish healthy habits for the students to pursue in their futures.

These studies stress that for physical activity and exercise counseling to effectively increase in patient care and treatment, medical schools' curriculums need to provide firm education and awareness about the importance of exercise as to their students, the students who are becoming the future medical care providers of tomorrow. Most medical students already have a foundational understanding of the benefits of exercise but are dissatisfied with the amount of training they receive on exercise counseling and exercise prescription from their medical schools (Gnanendran et al., 2011). Therefore, medical education programs should focus on the inclusion of exercise counseling and prescription in the curriculum so that future physicians will be well educated and confident in incorporating exercise counseling into their medical practices.

### **Implication for Future Research**

Many studies reveal that physicians who are currently physically active and exercise are more likely to counsel their patients to exercise (Morishita et al., 2014). Future research needs to consider how the attitudes of physician assistants and nurse practitioners, who assist physicians with the care and treatment of patients, influences the practice of counseling their patients to exercise. The education and training of these medical care providers on the benefits of exercise need to be studied to see if they feel confident in prescribing exercise to patients. The physical activity and exercise habits of PAs and NPs should be analyzed to see if they are meeting the

recommendations for aerobic and muscular exercise and if their personal exercise habits influence whether they address their patients' exercise habits during consultations.

## **Chapter III**

### **Methods**

This chapter summarizes the methodology for this research study on the attitudes and behaviors of physicians, PAs, and NPs towards counseling and prescribing exercise as preventative medicine.

#### **Design of the Study**

This study evaluated the exercise and physical activity habits of physicians, PAs, and NPs and their attitudes towards counseling and prescribing exercise to their patients as preventative medicine. The following research questions guided this study:

1. How many physicians, physician assistants, and nurse practitioners are currently meeting the ACSM guidelines for aerobic and muscular fitness?
2. How many and how often do physicians, physician assistants, and nurse practitioners discuss physical activity habits with their patients?
3. What are the attitudes and beliefs of physicians, physician assistants, and nurse practitioners towards exercise counseling as preventative medicine?

#### **Study Instrument**

A survey was used to examine the frequency of exercise counseling by health care practitioners towards their patients. Researchers have used online surveys, which are administered to participants online for ease and simplicity, to retrieve qualitative data about the physical activity habits of medical practitioners. Questionnaires and surveys have been successful in analyzing participants' self-reported physical activity and exercise habits which can include questions regarding the frequency, intensity, type and the amount of time spent exercising or participating in a certain activity (Standford et al., 2011; Standford et al., 2012;

Gnanendran et al., 2011; Abramson et al., 2000). Surveys are also preferred in retrieving qualitative data since most physicians have little time, and possibly desire, to be interviewed about their lifestyle habits and practices (Gnanendran et al., 2011).

Many studies performed in the United States assess physicians' exercise habits compared to specific guidelines for physical activity, such as from the ACSM's Guidelines for Exercise Testing and Prescription (2013), the U.S. Department of Health and Human Services (USDHHS) Physical Activity Guidelines (2008), and the Surgeon General's National Prevention Strategy for Active Living (2014). In this study, medical care providers' physical activity and exercise habits were compared to the ACSM's guidelines for aerobic and muscular fitness. Responses were also analyzed for perceptions of exercise as preventative medicine and their confidence from their training to prescribe exercise as medicine.

This study incorporated descriptive statistics within the research due to the low sample size. The dependent variables in this study are the questions used within the online survey that the participants answered. The survey had 49 questions that incorporated both multiple choices and fill in the blank questions in which the participants either selected the answer that best fit them personally or provided their own answer to the question (See appendix).

### **Participants**

The participants in the study were selected if they were a practicing physician, physician assistant, or a nurse practitioner in Illinois. There were 30 participants who took the online survey, but 5 participants were excluded due to not completing the questionnaire leaving a total of 25 subjects in this study. Overall, the study included 15 physicians, 4 physician assistants, and 6 nurse practitioners. The participants ranged from 25 years old to 65 years old with 13 male subjects and 12 female subjects. The specialty of practices included cardiology, emergency

medicine, family practice, OB/GYN, surgery, acute care medicine, density, hospitalist, pediatrics, internal medicine, and occupational medicine. Subjects had been practicing from 6 months to 39 years.

### **Research Site**

Participants were recruited (or identified) e-mail servers of mid-west hospitals. The specific population selected for the research was health care providers employed in Illinois. The researcher gained access to the specific selections of health care providers by contacting Human Resources and nurses at hospitals in Illinois. The researcher also reached out to specific physician, PA, and NP organizations in Illinois for recruitment of participants.

The researcher asked the Human Resources and nurses to forward an e-mail enclosed with information of the researcher, the study being proposed, and instructions for the survey to the specific health care providers' e-mail accounts. Enclosed within the e-mail was a link to the online survey in which subjects could complete within 5-10 minutes if they were interested in participating in the study. The participants' e-mail addresses were not collected within the survey for privacy protection of the participants in this research study. Besides either being physicians, PAs, and NPs employed at a hospital in Illinois, no other criteria were required of the participants for this research.

### **Researcher as the Instrument**

For this quantitative research study, data were gathered through Eastern Illinois University e-mail server and through the electronic questionnaire database, Qualtrics. The researcher is a Caucasian, female graduate student of the Kinesiology and Sports Studies Department at Eastern Illinois University. The researcher does not have a past career in health care and does not have any previous employment at any hospital or health care organization in

Illinois. The researcher does have previous exercise programming experience with adults who have a history of a cardiovascular diseases along with other diseases. The researcher became interested in this research topic due to experience with her graduate studies and experience with exercise programming along with a potential future career as a medical care provider.

### **Data Collection**

The participants were invited via email to participate in this research study on the attitudes and behaviors of physicians, PAs, and NPs towards counseling and prescribing exercise as preventative medicine. Subjects were informed that participation in this study was entirely voluntary.

After subjects were invited through their work e-mail to participate in the research survey, they were provided with a link that redirected them to the Qualtrics website. The online questionnaire format was selected because of its simple and direct ability to record information regarding the research topic. Qualtrics provides free online surveys for college students through institutional subscription, such as with Eastern Illinois University. The data website was selected due to the researcher's previous experience with administering online surveys through Qualtrics.

Participants in the study clicked on the hyperlink in the e-mail which directed them to the online survey site, Qualtrics.com. The first page of the survey provided additional information about the research along with purpose, procedures, and requirements of the survey. Subjects were informed that participation in the research was voluntary and that each could withdraw from the study at any time. The second page informed the participants about any risks in taking the survey and required consent if they chose to participate. The participants gave their consent to participate in the research by filling out the survey. Subjects completed at most 49 multiple-choice questions where they selected one of the provided answers that applied to them the best

along with completing fill-in-the-blank questions where they provided their own personal answer towards the question presented. If participants were reported that they were currently exercising, they were asked 15 questions asked about their involvement in aerobic and resistance training exercises. For the participants reported that they were not currently exercising, they were redirected to another section of the survey and were not asked any questions about their exercise habits. Therefore, 23 participants answered all 49 questions while 2 answered 34 questions. The survey took no more than 10 minutes to complete. The survey took no more than 10 minutes to complete. The participants were finished with their participation in the research study after completing the online survey. The survey questions administrated to the participants are listed in the appendix.

### **Treatment of the Data**

All data received from the online survey was kept on the researcher's laptop hard drive and on a flash drive that was only accessible to the researcher and thesis advisor. To maintain confidentiality, no identifying information was kept by the researcher besides the answers provided from the online survey. The researcher's field journal will be kept in a notebook, her laptop's hard drive, and on a flash drive that was only accessible to the researcher and thesis advisor. All data will be deleted after three years, in compliance with IRB policy.

### **Data Analysis**

SPSS and Microsoft Excel were used to analysis the data to create reports and graphs of the data. The researcher coded the data into three groups, one that represented data about participants' exercise habits, another that represented data about the frequency of the participants counseling on exercise, and a final one that represented the participants' attitudes towards



exercise counseling. The compiled data were entered into the SPSS software to calculate descriptive statistics for the three research questions.

## Chapter IV

### Results

The aim of this research was to analyze a wide variety of physicians, PAs and NPs employed in Illinois about their confidence and attitudes towards counseling patients to exercise. Of the many health care providers invited to participate in this research study, 25 useable responses were received from health care providers in Illinois. Descriptive statistics were used to answer the three posed research questions on the attitudes and practices of prescribing exercise for preventative medicine as well as the health care providers' own personal exercise habits. The findings to the questions are provided below.

Table 1 shows results from a compared mean of the number of participants who currently exercise. The results show that 23 participants (92%) out of the total 25 participants currently exercise while 2 participants (8%) do not.

Table 1

<i>Current Exercising Physicians, PAs, and NPs</i>		
Do you currently exercise?	N	Total N (%)
Yes	23	92.0%
No	2	8.0%
Total	25	100.0%

#### Research Question 1

The first question analyzed the aerobic and muscular exercise habits of health care providers in comparison to ACSM's guidelines for aerobic and muscular fitness by asking *how many physicians, physician assistants, and nurse practitioners collectively are currently meeting the ACSM's guidelines for aerobic and muscular fitness?* A test was conducted on the responses to questions on the participants' self-reported personal exercise habits. The 23 participants who

were currently exercising were asked 15 questions about their exercise habits while the 2 participants who were not currently exercising were excluded.

The null hypothesis was that the majority of current practicing physicians, PAs, and NPs were not meeting the ACSM's recommended aerobic (cardiorespiratory and cardiovascular) exercise of at least 30-60 minutes of moderate exercise for 3-5 days a week to achieve the recommended 150 minutes (500 MET-min/week) or 20-60 minutes of vigorous exercise 3 days a week to achieve the recommended 75 minutes (>1000 MET-min/week). The second null hypothesis was that most these health care providers were not meeting ACSM's guidelines for muscular fitness of resistance training each major muscle group 2-3 days a week.

For frequency of aerobic exercise, the 23 currently exercising participants were asked how many days a week they participated in aerobic exercise. It was reported that 9 participants are performing aerobic exercises 3 days/week, with 5 participants exercising 2x/week, 3 participants exercising 5x/week, and 2 participants performing aerobic exercise 4 days/week, 6 days/week, and/or 7 days/week.

Regarding duration of aerobic exercise, participants could select a range indicated in minutes of aerobic exercise they were performing each week. The mean minutes/week indicated that 28% of participants perform 30-60 minutes/week and 28% of participants perform 60-90 minutes/week, followed by 16% performing more than 180 minutes/week, and just 8% were exercising 90-120 minutes/week. It was reported that 4% of participants were performing less than 30 minutes/week, 4% were exercising for 120-150 minutes/week, and 4% were exercising for 150-180 minutes/week.

The last category examined the intensity at which the participants performed aerobic exercise. Almost half of the exercising participants (44%) exercise at moderate intensities,

followed by 32% who exercise at vigorous intensities, and 8% at light intensities. Some participants exercise at various intensities that include a mixture of 2 intensities or incorporate all three intensities, light, moderate, and vigorous.

With all three of the exercise categories taken into consideration, the exercise intensity, frequency, and duration of the participants' exercise sessions were analyzed to see if they are meeting ACSM's guidelines for aerobic exercise. Of the 23 exercisers, 14 (60.7%) met the aerobic guidelines, which results with 56% of the 25 of the medical practitioners meeting the recommended aerobic guidelines for healthy adults while 44% are not meeting the recommendations (table 2).

Table 2

*Mean of Physicians, PAs, and NPs meeting the ACSM's Guidelines for Aerobic Exercise*

Meeting	N	Total N (%)
Yes	14	56%
No	11	44%
Total	25	100.0%

The second half of research question 1 asked about the medical practitioners' participation in resistance training (RT) exercising. Table 3 shows the results of those who participated in resistance training. Of the 23 exercising participants, 14 subjects resistance trained while 9 subjects did not.

Table 3

*Mean of Exercising Physicians, PAs, and NPs who participated in RT Exercise*

	N	Total N (%)
Yes	14	60.9%
No	9	39.1%
Total	23	100.0%

For those who participated in RT exercise, the mean frequency of RT exercise was 3days/week followed by 2days/week. It was reported that weight lifting was the most common selection for RT exercise for participants.

To meet the ACSM's recommendation for muscular training exercise, participants would need to be resistance training the major muscles groups of the body for 2-3 sessions/week. Similar to the results for participants meeting the aerobic guidelines, table 94 revealed that 14 (56%) participants were meeting the guidelines for muscular training with 11 (44%) not meeting them.

Table 4

<i>Mean of Physicians, PAs, and NPs meeting the ACSM's Guidelines for Muscular Exercise</i>		
Meeting	N	Total N (%)
Yes	14	56%
No	11	44%
Total	25	100.0%

## Research Question 2

The second question examined the frequency that health care providers counsel their patients to exercise and become more physically active by asking *how many and how often do physicians, physician assistants, and nurse practitioners discuss physical activity habits with their patients?* The aim was to evaluate the frequency exercise counseling by the health care providers and how their own much their own personal exercise experience influenced their exercise counseling practices.

Table 5 shows the results from question #46 which asked the participants *how often do you discuss your physical activity habits as a source of an example with your patients?* Only 9 (36%) participants indicated that they sometimes discuss their own exercise experiences and 8

(32%) participants often discuss their own exercise experiences with their patients. Only 2 (8%) participants never used their own physical activity habits as an example to their patients while 6 (24%) rarely did.

Table 5

<i>Frequency of Ex. Counseling by Physicians, PAs, and NPs</i>				
	Mean	N	Std. Deviation	Total N (%)
<b>Question #46</b>				
Often	1.8750	8	.83452	32.0%
Sometimes	1.1111	9	.33333	36.0%
Rarely	1.8333	6	.98319	24.0%
Never	1.5000	2	.70711	8.0%
Total	1.5600	25	.76811	100.0%

### Research Question 3

The final question focuses on the participants' attitudes towards exercise counseling by asking *what are the attitudes and beliefs of physicians, physician assistants, and nurse practitioners towards exercise counseling as preventative medicine?* The participants responded to eleven questions regarding their attitudes on exercise counseling. The eleven questions are listed as questions 35-45 in the appendix.

Descriptive statistics were used on the 11 Likert scale questions to analyze the mean and standard deviation of the responses with 1=strongly agreeing to 7=strongly disagreeing. Anything below a mean of 2.5 directionally showed that the attitude towards the question agreed with the use of exercise counseling. Table 6 shows that the mean of these 11 scores was 2.12 which means that, on average, participants ranked their attitudes as agreeing or strongly agreeing on the importance and necessity of counseling their patients on exercise as preventative medicine.

Table 6

*Summary Item Statistics*

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	2.120	1.320	3.760	2.440	2.848	.565	11

## **Chapter V**

### **Discussion**

This chapter summarizes the significance of the results from the survey to better understand medical practitioners' attitudes towards exercise counseling and how often they incorporate it into their practices. The results from the survey also supports the importance of the surveyed medical practitioner's exercising and meeting exercise guidelines for themselves.

#### **Health Practitioners Meeting the Recommendations**

As revealed in numerous research studies, when physicians exercise and pursue physically active lifestyles, they are more likely to counsel their patients on the health benefits of activity and exercise (Abramson, Stein, Schaufele, Frates, & Rogan, 2000; Gnanendran, Pyne, Fallon, & Fricker, 2011; Standford et al., 2011). This study found 92% of the medical practitioners self-reported that they currently exercise, but only 56% (14 participants) are currently meeting ACSM's guidelines for aerobic fitness. Similar results are seen in the study's data on muscular fitness. Only 56% of the medical care providers were meeting the resistance training guidelines for muscular fitness while 44% of the were not meeting the guidelines. Therefore, only half of the tested medical practitioners are exercising enough to receive the beneficial effects of aerobic and resistance exercise.

These findings do not indicate that all other participants are completely inactive, though 2 participants did indicate that they are not currently exercising due limitations in their schedules. The two limitations providers by the participants were that the nature of their profession and long commutes to work limited their ability to pursue exercise and physical activity. Therefore, it was reported that the 9 other participants were just not exercising enough to meet the requirements of moderate exercise 3-5x/week for 30-60 minutes (500 MET-min/week) or of vigorous exercise 2-



5x/week for 20-60 minutes to achieve the recommended 75 minutes (>1000 MET-min/week), along with resistance training each major muscle group 2-3 days/week.

Future studies should incorporate a larger poll of participants from multiple hospitals throughout Illinois. More research should study how different specialties of these medical practitioners affect their counseling on exercise within their practices as well as their ability to pursue physically active lifestyles. If health practitioners are pursuing exercise for themselves, they could have a more positive attitude towards exercise counseling and prescription while also being role models to their patients.

### **Frequency of Exercise Counseling**

According to the study's results, only 8 (32%) of the 25 medical practitioners often discuss their physical activity and exercise habits as an example to their patients. This indicates that most of the surveyed medical practitioners are not using their own habits and exercise experiences within their practices, though they could be using other means to encourage physical activity and exercise to their patients.

Future studies should analyze the dynamics and structures of regular consultations for physicians, PAs, and NPs when they are with their patients, as well as the priority they set towards exercise counseling within the consultations. Further research should analyze the how often health care providers discuss physical activity with their patients and among which demographics of patients receive the most and least amount of exercise counseling.

### **Attitude on Exercise Counseling**

The data from this research study found that physicians, PAs, and NPs have an overall positive attitude ( $M= 2.12$ ) towards exercise counseling as preventative medicine. Research by Gnanendran et al. (2011) shows that having a favorable attitude towards exercise counseling

benefits healthy behaviors among health care providers and positively affects their counseling on exercise within their practices. The medical practitioners in the study strongly considered exercise and physical activity as a type of prevention for diseases related to physical inactivity and sedentary lifestyles ( $M=1.32, SD=.62$ ). They also strongly considered that exercise and physical activity are a type of treatment for diseases related to physical inactivity and sedentary lifestyles ( $M=1.64, SD=1.11$ ).

The physicians, PAs, and NPS believed that their medical and/or nursing school curriculum equipped them with a good understanding of the relationship between physical activity and its influence on disease prevention and management ( $M=1.52$ ). They also had a good understanding on how physical inactivity influences the risk of developing diseases ( $M=1.52$ ). In researching various studies about exercise being implemented as medicine and its uses among health practitioners within their practices, many studies found that the need for further exercise prescription education should be incorporated among health care providers' education. This study did not specifically examine the educational history of the participants but did ask a question on the exercise counseling and training education they received in their schooling and training.

### **Recommendation for Further Research**

Further research should analyze the type of education pursued by various health care providers as well as the information they were provided on exercise prescription and counseling. In *Training tomorrow's doctors, in exercise medicine, for tomorrow's patients*, Gates (2016) emphasized that because inactivity has increased the rate of morbidity among patients, it is vital for doctors to be well educated in effective exercise counseling.

With the addition of physical activity counselors and exercise specialists to the medical scene, patients can receive specialized training and more attention from these practitioners which can help with patients' adherence to exercise and healthy behavior change, resulting in effective exercise counseling (Tulloch, Fortier, & Hogg, 2006). Physicians, PAs, and NPs should also have a good understanding of the importance of referring their patients to exercise specialist and exercise programs to help their patients become active and receive proper exercise training. The goal is that if medical care providers are well educated on using exercise counseling within their practices, they will pursue exercise for their own health as well.

*In Attitudes of medical students, clinicians and sports scientists towards exercise counselling*, Gnanendran et al. (2011) specifically analyzed the four different health professions according to their education and how long they had been practicing. Interestingly enough, Gnanendran et al. (2001) found that older practitioners tend to prescribe exercise among their patients less than practitioners who are in their late 20's to early 30's. This brings up the additional question of how the attitude of exercise counseling can vary among health care providers who have been established and practiced for many years compared to young doctors? Another area for future research would be analyzing the depth in terms of classes and practical application of exercise counseling that each professional received throughout their training as well as their own personal experience in exercise.

The findings of this study could be an influential factor into how often and how many medical practitioners are counseling their patients on the importance of exercise and physically active lifestyles. Future research should focus on surveying a larger population of health care providers to study the relationship of exercise counseling frequency with the attitudes of various health care providers from other institution in and outside of Illinois.

## Conclusion

Physicians, PAs, and NPs can play very influential roles in the lives of their patients when it comes to supplying important information on health and wellness, healthy lifestyle behaviors, and health education. As the rise of physical inactivity and sedentary lifestyles increases among Americans so does the need for health care providers, specifically physicians, PAs and NPs, to be addressing these issues and counseling their patients on pursuing physical activity and exercise. By adopting these healthy behaviors into their lives, Americans can use physical activity and exercise as prevention against developing such conditions as hypertension, hyperlipidemia, diabetes, and obesity which will not only improve their quality of life, but reduce their risks of morbidity like cardiovascular, pulmonary, and metabolic disease. Physical activity and exercise can also be used as treatment for patients who already suffer from diseases like arthritis, diabetes, coronary artery disease along with many others. This study used an online survey to analyze the exercise habits of physicians, PAs, and NPs to understand their attitudes towards counseling their patients on exercise, and to analyze the frequency that these health care providers incorporate exercise counseling into their practices.

The data indicates that most physicians, PAs, and NPs do not often discuss their physical activity and exercise habits with their patients. However, almost all the participants have positive attitudes towards the importance of counseling their patients on exercise. Thus supporting the significance of the ACSM's EIM initiative among health care practitioners.

Lastly, 44% of the participants in this study did not meet the ACSM's guidelines for aerobic and muscular fitness. Although the "N" was low, there is evidence to suggest that further research is needed on this topic. Early indications reveal that physicians, PAs, and NPs collectively need proper training in recommending exercise as a prescribed prevention and

treatment for their patients' health and well-being. It is also revealed that the attention given to the medical practitioners' health is just as important as the attention and care they give to their patients. The rise of healthier physicians, PAs, NPs, and all medical staff together can have beneficial and influential effects of increasing the physical activity and exercise habits of American adults.

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## Appendix

### Participant Questionnaire

#### I. Survey Information

**Project Title:** Exercise is Medicine: A descriptive analysis of the exercise habits and attitudes towards exercise counseling of medical doctors, nurse practitioners, and physician assistants.

**Principal Researchers:** Zoë Roberts

**Purpose of Study:** The first purpose of this study is to analyze the amount of cardiorespiratory exercise that medical practitioners are obtaining compared to the American College of Sport Medicine's (ACSM) guidelines for cardiorespiratory fitness (CRF) and prescription. The second purpose is to evaluate medical practitioners' confidence and attitudes towards prescribing exercise as medicine for prevention and treatment of diseases.

**Procedure:** Procedure includes a subject information page, an informed consent, and an electronic questionnaire survey administered through Qualtrics.

If you volunteer to participate in this study, you will be asked to:

1. Sign an informed consent.
2. Complete an electronic questionnaire survey.

#### II. Informed Consent

You are invited to participate in a research study conducted by Zoë Roberts, from the department of Kinesiology and Sports Studies at Eastern Illinois University. You have been asked to participate in this study because of your career as a medical provider employed at a hospital.

Your participation in this study is entirely voluntary.

1. This is to certify that I, hereby agree to participate as a volunteer in a scientific investigation as an authorized part of the research program of the Kinesiology & Sports Studies Department of Eastern Illinois University under the supervision of Zoë Roberts.

2. I understand that participating in this survey will not pose any risks or discomforts to me and that participation in this study will not have any positive or negative effect on my employment at my institution.

3. I understand that there is not any individual compensation for completion of the online questionnaire and that participation in this study is strictly voluntary.

4. I understand that by participating in this survey that I am helping with graduate research from which I can gain the benefit of satisfaction that I am helping with the continuation of the graduate student's education.

5. I understand that any data or answers to questions will remain confidential.

6. I understand that I am free to deny any answers to specific items or questions on the questionnaires.

7. I understand that I am free to withdraw consent and to discontinue participation in the project or activity at any time.

8. I am participating in this project on my own free will and I have not been coerced in any way to participate.

9. I understand that I can contact the researcher with the provided researcher's contact information if I have any questions regarding the survey and research.

10. The investigation and my part in the investigation have been defined and fully explained to me by Zoë Roberts and I understand the explanation. A copy of the procedures of this investigation and a description of any risks and discomforts has been provided to me by e-mail.

**By clicking "Yes", I consent to participate in this survey.**

### **III. Personal Details and Demographics**

1. What is your age?
  - a. Fill in the blank
2. What is your gender?
  - a. Male
  - b. Female
  - c. Prefer not to answer
3. How tall are you?
  - a. Fill in the blank
4. How much do you weigh?
  - a. Fill in the blank
5. What is your qualification/affiliation?
  - a. MD

- b. DO
  - c. Nurse Practitioner
  - d. Physician Assistant
  - e. Other Fill in the blank
6. At which hospital are you employed?
- a. Fill in the blank
7. In which department do you work for?
- a. Fill in the blank
8. In what area of specialty do you practice?
- a. Fill in the blank
9. How long have you been practicing in your current position? (fill in the blank with the number of years)
- a. Fill in the blank
10. Do you have any certifications?
- a. Yes
  - b. No
11. If answered “Yes” to question #8: What certifications do you have?
- a. Fill in the blank
12. List all the degrees you have received (bachelors, masters, nursing, medical degree, etc.) and the year you received them.
- a. Fill in the blank

**PART 2: Physical Activity Profile**

13. How many hours a week do you work on average?

a. Fill in the blank

14. How many hours total do you spend sitting at work performing office work, consultations with clients, research, etc.?

- a. <1 hour
- b. 1-2
- c. 2-4
- d. 4-6
- e. 6-8
- f. 8-10
- g. 10+

15. How many hours total do you spend standing at work monitoring patients, assisting doctors, performing procedures, lecturing, etc.?

- a. <1 hour
- b. 1-2
- c. 2-4
- d. 4-6
- e. 6-8
- f. 8-10
- g. 10+

16. Indicate the activity levels of your current position?

- a. Light Activity – sitting for the majority of the day
- b. Moderate Activity– equally sitting, standing, and moving for the majority of the day.

- c. **Vigorous Activity** – quickly moving or walking to different rooms and/or departments, constantly moving and transferring items to different locations, continuously exerting physical effort for the majority of the day.

17. Do you currently exercise?

- a. Yes
- b. No

#### **IV. Exercise Habits**

18. What are your reasons for exercising? (click all that apply)

- a. To relieve stress
- b. To lose weight
- c. To maintain a healthy lifestyle
- d. For enjoyment
- e. To be an example to patients
- f. As a hobby
- g. To socialize with family, friends, etc.
- h. Other (Fill in the blank)

19. Where do you currently exercise? (click all that apply)

- a. Gym
- b. Recreational Community/Town Center
- c. YMCA
- d. At home
- e. At work
- f. Other (Fill in the blank)



20. Which type(s) of cardiorespiratory exercise(s) do you perform each week? (click all that apply)

- a. Running (treadmill, track, trails, streets, etc.)
- b. Walking (treadmill, track, trails, streets, etc.)
- c. Swimming
- d. Cycling
- e. Group Aerobics classes (Zumba, Jazzercise, aerobic kickboxing, cardio dance, aqua aerobics, etc.)
- f. Cardio machines (elliptical, Arc Trainer, etc.)
- g. Kickboxing
- h. Rowing
- i. Other: Fill in the blank

21. At what intensity to do perform cardiorespiratory exercise?

- a. Light – Activities are light enough that breathing does not change much, very little sweat is produced, can easily carry on a conversation.
- b. Moderate – Activities are somewhat hard, breathing quickens but can still breath and carry on a conversation, heart rate is between 50-70% of Max Heart Rate, begin sweating after 10 minutes of activity.
- c. Vigorous – Rapid and deep breathing, Heart Rate is near Max Heart Rate, begin sweating a few minutes into activity, muscles fatigue quickly.

22. How many days a week do you perform cardiorespiratory exercise?

- a. 1 day
- b. 2 days

- c. 3 days
  - d. 4 days
  - e. 5 days
  - f. 6 days
  - g. 7 days
23. How many minutes do you perform cardiorespiratory exercise each week?
- a. <30 minutes
  - b. 30-60 minutes
  - c. 60-90 minutes
  - d. 150-180 minutes
  - e. >180 minutes
24. How many months have you been consistently performing cardiorespiratory exercises consistently for 3-5 days/week?
- a. <3 months
  - b. 3-6 months
  - c. 6-12 months
  - d. >12 months
25. Do you perform resistance training/ weight lifting exercises?
- a. Yes
  - b. No
26. Which type(s) of muscular/resistance training exercise(s) do you perform each week?  
(click all that apply)
- a. Weight lifting

- b. Olympic lifting
  - c. CrossFit
  - d. Boot-Camp training
  - e. HIIT Training
  - f. Pilates
  - g. Other: Fill in the blank
27. How many days a week do you perform muscular/resistance training exercise?
- a. 1 day
  - b. 2 days
  - c. 3 days
  - d. 4 days
  - e. 5 days
  - f. 6 days
  - g. 7 days
28. At what level do you perform muscular/resistance training exercise?
- a. Beginner - have been resistance training for 6-12 months
  - b. Intermediate – have been have been resistance training for 1-2 years
  - c. Advanced – have been resistance training for 2+ years
29. If you are currently inactive or do not exercise regularly, what are your current barriers towards exercise? (click all that apply)
- a. Do not have enough time
  - b. Cannot afford to join a gym

- c. Do not consider exercise as an important factor for my life
  - d. Do not have motivation to exercise
  - e. Happy with my current level of physical activity
  - f. Have a physical condition that limits my ability to exercise or to be physical activity.
  - g. I regularly exercise and have an active lifestyle
  - h. I have children at home to look after and do not have time to exercise.
  - i. Other (Fill in the blank)
30. I do more exercise now compared with before I started medical training (either nursing school or medical school).
- a. Strongly agree
  - b. Agree
  - c. Somewhat agree
  - d. Neither agree nor disagree
  - e. Somewhat disagree
  - f. Disagree
  - g. Strongly disagree
31. Does your work (hospital, clinic, department) provide a gym or health center for you to use to workout, take fitness classes, or participate in health programs?
- a. Yes
  - b. No
  - c. I do not know

32. Do you use any of the programs that your work's gym or health center provides?

- a. Yes
- b. No
- c. Sometimes

33. If your work (hospital, clinic, department) provides a gym or health center for you to use, list what you typically use their (gym, group fitness classes, personal training, using their track and/ or pool, etc.

- a. Other: Fill in the blank

### **PART 3: Attitudes Profile**

34. Do you enjoy exercising and participating in physical activity?

- a. Yes
- b. No

35. I do **more exercise now** compared with before I started medical training (either nursing school or medical school).

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

36. I have become more knowledgeable about the health benefits of exercising from my education and/or current position.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

37. I consider exercise and physical activity as a type of **prevention** for diseases related to physical inactivity and sedentary lifestyles.

- a) Strongly Agree
- b) Agree
- c) Somewhat agree
- d) Neither agree nor disagree
- e) Somewhat disagree
- f) Disagree
- g) Strongly Disagree

38. I consider exercise and physical activity as a type of **treatment** for diseases related to physical inactivity and sedentary lifestyles.

- a. Strongly Agree

- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

39. Exercise counseling is important in my intended (or current) field of professional practice.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

40. Should medical care providers play a role in encouraging physical activity and exercise?

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree

- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

41. **Exercise counseling** is important in my intended or current field of medical practice.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

42. If a medical practitioner **exercises and is physically active**, he or she will be **more likely** to encourage exercise and good physical activity habits to his or her patients.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree



43. Through my medical and/or nursing school curriculum, I have a good understanding of the relationship of the following:

- physical activity and its influence on disease prevention and management
- physical inactivity and its influence of increased risk of developing diseases

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

44. I am confident in counseling patients on physical activity and cardio, muscular strength, and muscular endurance exercises to incorporate into their lifestyles.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

45. I **am pleased** with my professional training and/or knowledge in exercise counseling and/or prescription.

- a. Strongly Agree
- b. Agree
- c. Somewhat agree
- d. Neither agree nor disagree
- e. Somewhat disagree
- f. Disagree
- g. Strongly Disagree

46. How often do you discuss your physical activity habits as a source of an example with your patients?

- a. often
- b. sometimes
- c. rarely
- d. never

47. Are you familiar with the ACSM's Exercise is medicine initiative?

- a. yes
- b. no

48. Do you know what the FITT principle stands for?

- a. yes
- b. no

49. Do you know the 5 components of fitness?

a. yes

b. no