

A comparison of personal exercise habits and attitudes between the medical community and the general population

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Concentration in Physician Assistant Studies

A Comparison of Personal Exercise Habits and Attitudes Between the Medical
Community and the General Population

Submitted by

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Dedication

I would like to thank my parents and friends for supporting me while I completed this project. I would also like to thank Dr. Hampton for his patience and for keeping me on task.

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Introduction

Despite substantial evidence regarding the importance of exercise, a large and increasing percentage of the United States population is sedentary. Recent data shows that approximately 70% of US adults are not regularly physically active and fail to meet the minimum amount of exercise that is associated with disease prevention. The CDC (Center for Disease Control) defines this as at least thirty minutes of continuous or accumulated physical activity on most days of the week (McInnis, 2003). Even more disturbing, 29% of the population are inactive and participate in no physical activity leisure or competitively alike. Women, ethnic minorities, adults with less education, individuals with lower income, obese individuals, and elderly adults tend to be the least active (Paluska, 2002).

It is well known and supported by many sources, that the benefits of exercise are directly related to the prevention and treatment of coronary artery disease, hypertension, type II diabetes, osteoporosis, cancer, depression and anxiety, and obesity (Abramson, Stein, Schaufele et al, 2000). With this information, physicians and other health care providers' exercise habits are of particular interest. First, the health care workers are considered well informed on the benefits of a healthy lifestyle and regular exercise, and secondly, their personal exercise habits may influence their patient counseling practices on exercise. Several previous studies of small groups of physicians have discovered that as a whole, physicians exercise habits are better than the general population, and there have been limited studies of the effect of a health care providers exercise habits on the counseling of exercise to patients (Frank, Scelbert, Elon, 2003). The vast majority of the studies that have been conducted on the exercise habits of health care providers have been limited to primary care physicians both male and female. The purpose of this study is

to compare the exercise habits of health care providers to the general population and to evaluate the role of the health care workers' personal exercise habits on recommendation for patient exercise.

Literature Review:

There have been many studies that have shown that regular physical activity, which is defined as at least three times a week for thirty minutes or more, is associated with enhanced health and reduced risk for mortality associated with diseases that are influenced by weight and degree of sedentary lifestyle. Beyond the effects on mortality, physical activity has multiple health benefits, including reducing the risk for cardiovascular disease, diabetes, obesity, selected cancers, and musculoskeletal conditions (CDC, 2001; Kinningham, 2001; Albright, 2000; & Leemakers, 2001).

Physical inactivity and dietary patterns are second only to tobacco use as a leading cause of preventable death in the United States. Physical inactivity is also a leading contributor to morbidity and disability. In the United States, the majority of persons do not achieve the recommended amounts of physical activity. Due to this, the Healthy People 2010 national health objectives written by the Center for Disease Control, lists physical activity as a leading health indicator (CDC, 2001).

The adverse health effects of obesity and physical inactivity have been extensively documented, and excessive weight has been associated with increased mortality from all-cause death among adults. Moreover, lack of physical fitness increases the risk of mortality from atherosclerotic cardiovascular disease two- to threefold. Lack of leisure-time physical activity and excessive weight are associated with diminished quality of life, decreased vitality, and impaired physical functioning (Paluska, 2002). In addition, physical activity and obesity are significant risk factors for chronic diseases such as hypertension, stroke, thrombogenesis, breast cancer, sleep apnea, colon cancer, gallbladder disease, osteoarthritis, hyperlipidemia, type II diabetes, and endometrial cancer. Regular physical activity and focused weight reduction, on the

other hand, have been shown to reduce the morbidity and mortality of many chronic health conditions. Symptoms of mental health diseases such as panic disorder, anxiety disorders, and mild to moderate depression improve with regular physical activity. Data has confirmed that those who increase their physical fitness reduce their risk of mortality from all cause by 44% compared with those who are unfit. Clearly, effective weight loss interventions have become increasingly necessary to reduce the health risks related to the burgeoning levels of obesity (Paluska, 2002).

In a study published by the American Heart Association (AHA), physical inactivity was recognized as a risk factor for coronary artery disease. Regular aerobic physical activity increases exercise capacity and plays a role in both primary and secondary prevention of cardiovascular disease. Exercise has also been correlated with increased ability to control blood lipid abnormalities, diabetes, and obesity. In addition, aerobic exercise adds an independent blood pressure lowering effect in certain hypertensive groups with a decrease of eight to ten millimeters Hg in both systolic and diastolic blood pressure measurements (Fletcher, 1996). The AHA suggested activities such as walking, jogging, running, bicycling, stair-climbing, aerobic exercise, hiking, and sports such as tennis, racquetball, soccer, basketball, and football are especially beneficial for health when performed regularly. Evidence also supports that even low to moderate intensity activities performed daily can have some long term health benefits and lower the risk of cardiovascular disease (Fletcher, 1996).

Fewer active persons develop coronary heart disease (CHD) than those who are sedentary do, and the beneficial effects of exercise on risk factors for CHD are well documented. Despite this, inactive lifestyles and overeating remain the norm for most Americans, which is well illustrated by the rising epidemic of obesity over the past three decades (Mosca, 2004). In

response to this situation, the Institute of Medicine recently issued a statement that raised the bar for sedentary Americans, suggesting that everyone engage in at least 60 cumulative minutes of moderate intensity physical activity on most, and preferably all, days of the week rather than the 30 minutes suggested by other organizations including the ACSM. The added benefits of increasing daily physical activity is supported by prospective data showing a graded benefit of brisk walking for more than an average of 30 minutes daily. The new recommendations suggest that 60 minutes of continuous daily activity is not necessary to derive benefit, but that the accumulated amount can be spread over a day from several shorter episodes. Although there is much evidence that increasing the amount of time of exercise will decrease the risk of CHD, many physicians have been unable to accept these new guidelines due to lack of patient motivation. Many practicing health care providers have struggled to achieve patient commitment to exercise for 30 minutes and the majority of the providers feel that 60 minutes of exercise may be an unrealistic goal (Mosca, 2004).

An astonishing one in ten Americans presently dies prematurely of disorders with origins related to physical inactivity (Chakravarthy, 2002). In 1996, annual deaths in the United States from colon cancer, coronary heart disease, and stroke numbered 256,686 in persons aged 18 to 65 years old who reported being sedentary or irregularly physically inactive. Moderate physical activity may annually eliminate 250,000 premature deaths from coronary heart disease, colon cancer, and type 2 diabetes mellitus. Physical activity has been determined to be a first line therapy and protects against many chronic health conditions by improving glucose uptake and insulin sensitivity, improving blood lipid profiles, lowering blood pressure, improving atherosclerosis, and protecting against obesity. With this knowledge of primary prevention of

chronic disease with exercise, still 70% of American adults either do not undertake physical activity or are underactive (Chakravarthy, 2002).

A substantial body of evidence now demonstrates the burden of ill health is attributable to sedentary living. Besides a reduced risk of CHD, evidence is secure for many other health gains from physical activity; these include a reduced risk of stroke, type II diabetes, colon cancer, and hip fracture (Hardman, 2001). Physically active people have a lower disease risk than sedentary individuals but the components of activity, which determine health gains are poorly understood (Hardman, 2001). It has been determined that anything equal to or above “fairly brisk walking” is sufficient intensity to achieve a lower disease risk. Recent recommendations for frequency of exercise are activity in most, preferably all, days of the week. The amount prescribed is greater than thirty minutes of activity in each exercise session. However, there has been an inverse relationship between the total energy expended in leisure time physical activity and health outcomes. These include a lower risk of all cause mortality, cardiovascular morbidity and mortality, type II diabetes, hypertension, and site-specific cancer. Exercise sessions can be broken up into ten-minute sessions and still achieve these lower risks as long as at least an overall of thirty minutes is achieved. In this study, walking was found to be the most commonly reported physical activity, particularly among women and older men. Walking is as beneficial as running in those whose health is at risk because of their inactivity because walking is sufficiently vigorous to improve fitness in sedentary people (Hardman, 2001).

Numerous intervention studies have been completed that explore the impact of exercise training of various intensities on overall morbidity and mortality. Another issue that is necessary to be addressed is the effectiveness of physical activity in reducing overweight and obesity. It has been concluded that obesity and being overweight have a direct correlation with increase in

disease. However, even with this knowledge, the majority of the United States general population is overweight or obese (DiPietro, 1999). Recent data from the National Health and Nutrition Examination Survey (NHANES III) suggest that overweight (BMI = 25-29.9) is present in approximately 32% of the adults living in the United States. The overall prevalence of overweight currently is highest in men and women age 60-69 years (45% and 34%, respectively) and then is progressively lower at older ages. Data further shows that the population as a group, and particularly African-American women of lower socioeconomic status, is becoming heavier with time and that the increase in prevalence of overweight may be most accelerated among those individuals who are already overweight or obese (DiPietro, 1999).

Many studies have examined the results of exercise training on the reduction of weight and body fat. It can be concluded from these studies that: 1) physical activity affects body composition and weight favorably, by promoting fat loss, while preserving lean mass; 2) the rate of weight loss is positively related to the frequency and duration of the exercise session, as well as the duration of the exercise program, thereby suggesting a dose-response relationship; and 3) although, the rate of weight loss results from increased physical activity is relatively slow, physical activity may nonetheless be a more effective strategy for long-term weight regulation than dieting alone. However, although there is evidence of a relation to attenuated weight gain, it is not clear that increased physical activity actually prevents or reverses age-related weight gain at the population level (DiPietro, 1999).

In a recent statement released from the United States Department of Health and Human Services, physical activity was stated to be “fundamental to preventing disease”(USDHHS, 2002). It might be stated that one of the issues of greatest concern for the general public and health care practitioners is not whether physical activity is beneficial to health but how much and

what kind. From a public health perspective, the biggest challenge is not how much or what type of exercise, but how to promote and actively engage the adult population in regular physical activity. Only 25% of the adult population are sufficiently active to meet the Surgeon General's recommendations and approximately 30% who are entirely sedentary (USDHHS, 2002).

Despite all of the evidence that supports regular exercise, numerous studies have shown that most people in the general population are not exercising. More than sixty percent of adults in the United States do not meet the physical activity recommendation from Centers for Disease Control and Prevention (CDC) and the American College of Sports Medicine (ACSM). These two organizations suggest that every adult should accumulate thirty minutes or more of moderately intense physical activity on most, if not all, days of the week. The most disturbing statistic is that twenty-nine percent of the population are inactive and participate in no leisure time physical activity (Paluska, 2002).

In Healthy People 2000, the general population was categorized on the basis of leisure-time physical activity behavioral patterns rather than on energy expended, the four exposures categories and the prevalence estimates for this study are 1) sedentary (24% of the population) – those who engage in no leisure-time physical activity, 2) irregularly active (54%) – those who engage in some light to moderate physical activities but do so either fewer than 30 min per day or fewer than five days a week, 3) regularly active (10%) – those who do engaged in light to moderate leisure-time physical activity for 30 min. or more at least five days a week, and 4) vigorously active (12%) – those who engage in vigorous physical activity three or more days a week for twenty minutes or more per session (USDHHS, 1991). The projection for Healthy People 2010 is very similar. Although the numbers are not exactly the same, the proportion of

Americans in each category is the same. The general public is still not getting enough exercise (USDHHS, 2001).

It has been well documented that low levels of physical fitness are associated with an increased risk of all-cause mortality and cardiovascular disease (CVD) mortality, with age-adjusted relative risks of CVD up to eightfold greater for unfit groups than their fit counterparts. The increased risk among unfit individuals is substantially greater than the risk reported for inactive participants in studies of physical activity and mortality, in which an approximate doubling of risk is seen when inactive groups are compared with active groups (Blair, 1995). In a prospective study of 9777 healthy and unhealthy men, a relationship between changes in physical fitness and risk of mortality was established. The highest all-cause death rate was observed in men who were unfit; the lowest death rate was in men who were physically fit. Men who improved from unfit to fit between the first and last examination had a 44% reduction in mortality relative to men who remained unfit at both examinations. Improvement in fitness was associated with lower death rates after adjusting for age, health status, and other risk factors of premature mortality. Overall, men who maintained or improved adequate physical fitness were less likely to die from all causes and from cardiovascular disease during follow-up than persistently unfit men. It has been concluded that physicians should encourage unfit men to improve their fitness by starting a physical activity program (Blair, 1995).

In another prospective study of 10,269 Harvard alumni men, who were 45 to 84 years of age in 1977 and who had reported no life-threatening diseases on questionnaires completed in 1962 or 1966 and again in 1977 were classified according to changes in lifestyle characteristics between the first and second questionnaires. Of the 10,269 men, 476 died during the time period. Beginning moderately vigorous sports activity (at an intensity of 4.5 or more metabolic

equivalents) was associated with a 23% lower risk of death than not taking up moderately vigorous sports. The 1977 questionnaire responses indicated a notably high proportion of men who participated in vigorous sports activity; they accounted for three fourths of the population that was a near reversal of the 1962 or 1966 response. From 1977 through 1985, the relative risk of death was halved among the quarter of the alumni who reported three or more hours of moderately vigorous activity per week, as compared with the quarter who did not engage in such sports or recreational activity. Men who discontinued moderately vigorous sports activity had a 15 percent higher risk of mortality than men who had never reported such activity (Paffenbarger, 1993).

In comparison, sedentary alumni (those that did not participate in any physical activity) were at 36 percent higher risk of death from coronary heart disease than active men. Men who climbed fewer than 20 flights of stairs per week and did not engage in moderately vigorous sports activity were at 56 percent and 51 percent respectively, higher risk than men who climbed more stairs or engaged in moderately vigorous activity. However, only 14% of the population surveyed were classified as sedentary which is well below the national average at that time and presently, in that over 30% of the population is considered sedentary (Paffenbarger, 1993).

In Caspersen, it was determined that there was a difference in the amount and frequency of exercise based on the age and gender of the individual. Among adolescents, physical activity patterns generally eroded most from ages 15 to 21 from “regular, vigorous activity” and strengthening patterns declined consistently from ages 12 to 21. Young adulthood (18-29) often marked continuing erosion of activity patterns, whereas middle adulthood (30-64) offered relatively stable patterns. At retirement age (65 yr.), there was a stabilizing or even an improving pattern, usually followed by further erosion through the final periods of life

(Caspersen, 2000). Among adolescents, differences between females and males were large for regular, vigorous activity. In comparison with female adolescents and adults, male respondents reported higher rates of regular, sustained activity and strengthening exercises. Among adults, physical inactivity among women were moderately greater than the physical inactivity of men (Caspersen, 2000).

In another study by Cook, the level of leisure time physical activity is directly related to the degree of urbanization and it varies in different geographic regions. The overall prevalence of leisure time physical inactivity was lowest (27.4%) in central metropolitan areas and highest (36.6%) in rural areas. The difference in the prevalence of leisure time physical inactivity in residents of metropolitan areas compared with residents of rural areas was greater for men (12.0%) than women (6.7%). The overall prevalence of physical inactivity was lowest for respondents in the West (21.1%). In the South, the prevalence of physical inactivity was higher (34.2%) and the inverse relation with degree of urbanization was stronger than in the other regions. The largest difference in reported physical inactivity between rural and urban areas was in the South. In this particular analysis, residents of rural areas were older, less educated, and poorer than those of urban areas (Cook, 1996).

It has been reported that those with less education, lower income, and older in age are more likely to be physically inactive (Cook, 1996). Fifty percent of the populations that had less than a high school degree and are making less than \$10,000 a year are regularly physically inactive. As the opposite, only eighteen percent of college graduates and those with a yearly income greater than \$50,000 are physically inactive. Twenty-two percent of the populations 18-29 were physically inactive, compared to forty-two percent of the population >75 years of age.

Overall the older a population the more likely to not participate in regular physical activity (Cook, 1996).

Women are more likely to be physically inactive than men. In Cook, it was found that almost thirty percent of women in urban areas are physically inactive compared to the twenty-five percent of men. Women in rural communities are even more unlikely to exercise (32.7%) compared to twenty-nine percent of men that reside in a rural area. However, as men and women age the disparity declines until they are even when the population reaches the ages of 65 and older (Cook, 1996).

The proportion of leisure time physical activity levels that were stratified by age among healthy women with normal weight varied very little with a comparison of age and the physical activity levels according to one study of 9357 healthy women, aged 20-49 years, who had a normal body weight (BMI 18.5 – 24.9) at baseline. Accounting for age, a third of the women participated in low leisure time physical activity level (38%). The majority of women participated in moderate level leisure time physical activity (46%). Only eighteen percent of the women involved in the study participated in high-level leisure time physical activity. Overall, only sixty percent of the women survey participated in any physical activity and of that sixty percent, only forty percent meet the criteria defined by the ACSM. Altogether, 82% of the participants were categorized as having low or moderate levels of physical activity, which indicated a generally sedentary lifestyle of women in this population (Droyvold, 2004).

Blacks and other minority populations are less active than white Americans, with this disparity being more pronounced for women. Twelve percent of Non-Hispanic white American men are reported to be physically inactive. In contrast twenty-two percent and thirty-two percent of Non-Hispanic black American men and Mexican American men are physically inactive

respectively. Women are more inactive than men with the minority populations having a higher percentage of physically inactive individuals overall. Twenty-two percent of Non-Hispanic white women are physically inactive. In comparison to Non-Hispanic white women, almost forty percent and forty-six percent of Non-Hispanic white American women and Mexican American women are physically inactive respectively (Kriska, 1998).

In a study by Saxena, 305 females residing in a large northeastern city that presented to a primary care site were surveyed on their participation in vigorous physical activity and the factors associated with this level of exercise. It was determined that 30.5% of inner city females reported engaging in regular vigorous exercise in the last week, while 46.6% reported no physical activity. Four factors were significantly associated with regular vigorous exercise including: most or all friends exercised; involved with a sports team; trying to lose weight; and believing in the importance of exercise. Those who engaged in no vigorous physical activity or exercise were significantly more likely to be older when compared to those who engaged in either some or more frequent vigorous exercise. It was discovered that sexually active females were significantly more likely to report no vigorous exercise as compared to those who reported at least some level of vigorous exercise. Although not significant, young women with children were more likely to report not engaging in vigorous physical exercise as compared to young women without children. Overall, among the sample of primarily minority, inner-city females, engaging in regular vigorous physical activity was much less than has been suggested by other studies (Saxena, 2002).

In Burton, blue-collar employees were found to experience higher mortality and morbidity rates for chronic degenerative conditions such as cardiovascular disease than their counterparts in white-collar and professional occupations. Occupational differences in health-

related behaviors such, as physical activity may be an important contributing factor to this variability in health status. Typically, blue-collar employees report lower levels of participation in leisure-time physical activity than those in white-collar or professional positions (Burton, 2000).

Of the 24,454 persons surveyed in the Burton study, the majority (67.7%) was classified as being insufficiently active for health. The rate of insufficient activity was higher among females than males. For males, the highest rates were found among older age groups, blue-collar employees, those working longer hours, fathers with dependent children, current smokers, the obese and those who failed to report their height and/or weight, and those who assessed their health as poor. With the exception of hours worked, a similar profile was evident for females. Rates of insufficient activity tended to increase with age and were highest among blue-collar employees, mothers with dependent children, current smokers, the obese and those who did not know or state their height and/or weight, and those reporting “poor” health (Burton, 2000).

Approximately 50% of males in professional occupations worked 50 hours or more each week compared with 27 and 28% in white- and blue-collar jobs, respectively. The corresponding figures for females were 21.6 and 8%. There were marked sex differences in terms of hours spent in paid employment each week. Compared with males, females tended to work fewer hours and were disproportionately concentrated in part time occupations (defined as less than 35 hours a week) (Burton, 2000). It has already been established that blue-collar workers rates of insufficient activity for health were significantly higher compared with white-collar workers, but there is also a correlation in hours worked and rates of insufficient activity for health. Rate of insufficient activity were 22-25% higher for those working 25-34 hours, 34-36% higher for those working 35-49 hours, and 50% higher for employed males working 50 hours or more. A reverse

pattern of association between hours worked and rates of insufficient activity are found for males employed 15-24 hours a week. Those working 15-19 and 20-24 hours per week were less likely to be insufficiently active for health. Overall, males working part time up to 20 hours per week did more leisure time physical activity than those working full time (>35 hours). Females working up to 14 hours per week did more physical activity than those working full time. There were no differences in leisure time physical activity among male and female full time employees whether working 35 hours per week, or more than 50 hours per week (Burton, 2004).

It has been well established that about 60% of people in the United States report little to no leisure-time physical activity. In fact, most of the western world continues to maintain a sedentary lifestyle (Fogelman, 2003). In a study conducted by Fogelman, 300 individuals from the general public were selected at random to answer a questionnaire about their exercise habits and attitudes. Overall, women tended to be more sedentary than their male counterparts. Almost half the sample population studies (48.2%) were found to lead a sedentary lifestyle. A direct relationship between lower level of education and greater physical activity at work, and higher level of education and greater engagement in sports activities was also discovered. Results further showed that 17.5% of those who answered yes to participating in regular physical activity were found to be sedentary on analysis of their specific report of intensity of physical activity. The highest rates of inactivity were noted in women and in subjects with less education. The most common barriers to exercise perceived by the sample were too lazy/not motivated/could not get started, 45%; too busy/had other commitments, 42%; injured or disabled, 11%; and too fat, 2%. Only 4 % considered physical activity to be of low priority (Fogelman, 2003).

Sedentary lifestyle was defined as fewer than three 20-minutes sessions of leisure-time physical activity per week by the National Center for Chronic Disease Prevention and Health

Promotion (Siegel, 1993). A nationwide random-digit dialing behavioral risk factor survey was conducted by the Behavioral Risk Factor Surveillance System. This system surveyed thousands of people in forty -seven states and the District of Columbia on their behavioral risk habits including their physical activity. The results of this study showed different prevalence of sedentary lifestyle from state to state and region to region. Overall the prevalence of sedentary lifestyle ranged from 46.6% in Oregon to 73.4% in Virginia. Of the five states with prevalence <50% (Colorado, Montana, New Hampshire, Oregon, and Utah), four were western states. Ohio, South Carolina, and Virginia reported prevalences > 70.0%. The southern states and midwestern states were the most sedentary regions in the nation while the west was by far the least sedentary area (Siegel, 1993).

The American lifestyle has been described as sedentary. A recent analysis indicated that in 1991, 58.1% of adults reported irregular or no leisure time physical activity compared to a 2001 study that indicated that >70% of American adults do not participate in physical activity. The percentage of adults who exercised or played sports regularly decreased between 1985 and 1990 among black, Hispanic, and unemployed persons. The prevalence of overweight individuals and inactivity may be correlated with cultural and social factors. The high prevalence of overweight and inactive individuals are among black and Mexican-American women may reflect cultural values and beliefs that limit the motivation for or the effectiveness of weight control, specific behaviors such as lower levels of physical activity, or a combination of these and other influences (Kuczmarski, 1994).

Although there is so much information about the benefits of exercise much of the population does not participate in regular physical exercise. The forefront of exercise information and suggestion comes from physicians and other health care professionals. Almost

all physicians are well versed on the importance of exercise, and their personal exercise habits may influence their patient counseling practices on exercise. Although most physicians appreciate the need for exercise, many do not counsel their patients accordingly due to lack of time in a medical interview, lack of knowledge on exercise, and lack of confidence in their ability to prescribe medicine (Jakicic, 2003). There have been very few studies that have considered the personal exercise habits of the medical profession and their attitudes toward exercise. The few studies that have been conducted primarily focus on primary care physicians, which were defined as family practitioners, pediatricians, geriatricians and internists. There is also little information on physicians' personal exercise habits and their habits of exercise prescription and advice to their patients.

In one study by Abramson, 298 primary care physicians were given a self-report survey on their exercise habits and their influence on prescription to the patients. The study indicated that seventy-three percent of physicians participated in aerobic exercise on a regular basis, and only forty-one percent of physicians participated in strength training exercise on a regular basis. Female physicians were equally likely to perform aerobic exercise as male physicians, but were less likely to perform in strength training exercises. The study also revealed that physicians that perform aerobic exercise regularly are more likely to counsel their patients on the benefits of exercises, as are physicians who perform strength training. Pediatricians and geriatricians counsel fewer patients about aerobic exercise than family practitioners and internists. Counseling regarding strength training is less common in all physicians groups surveyed, lowest among pediatricians, of whom fifty percent did not advise these exercises for any of their patients. The major barriers for not counseling patients regarding aerobic exercise were

inadequate time, which was noted by sixty-one percent of physicians and inadequate knowledge and lack of experience by sixteen percent (Abramson, 2000).

In another study 382 physicians were surveyed on their exercise habits and dietary practices. Three fourths of the doctors surveyed exercise regularly and half take vitamins. In addition, eighty percent of the doctors were satisfied with their overall health, and sixty-two percent were pleased with their general fitness level. About one-third were in diets within the past year, but only eight percent of those who dieted followed a weight loss plan recommended by another physicians; 67 percent simply ate smaller portions, and 65 percent eliminated specific foods (Montague, 1996).

In a study by Modern Medicine, 657 family physicians nationwide were given a questionnaire survey about how they would describe their own health. Ninety-two percent of the family practitioners say they are in good health and less than ten percent have any known cardiovascular disease or diabetes. About thirty percent of the physicians consider themselves to be overweight, and half say they do not get enough exercise (Modern Medicine, 1997).

In Frank, 2003, a study was published based on the Women Physicians' Health Study exercise data, a national study of 4501 women physicians. The number of women physicians in the United States has grown enormously in the last several decades. Women constitute 40% of current medical school classes. However, little is known about the personal health-related behaviors of this increasingly important sector of medical practitioners and the Women Physicians' Health Study addressed these shortcomings. Knowledge of women physicians' health behaviors may be especially useful in setting realistic national objectives for disease prevention in women (Frank, 2003). Nearly all (96%) women physicians reported exercising. Forty-nine percent exercised enough to meet the American College of Sports Medicine (ACSM)

recommendations, and these physicians were more likely to be unmarried, to be white, to have light stress at home and work, to have female physicians, to be in good health, and to not feel overweight. The most common exercise was walking, followed by gardening, biking, other, swimming, running, and aerobics. The research study cited marriage, especially with children, as the most significant barrier to women's exercise. Physicians that complied with ACSM recommendations also were more likely to counsel patients on exercise, to counsel confidently, and to be trained in counseling. Those having a higher priority to exercise were more likely to counsel on exercise. Fifty-nine percent of female primary care physicians counseled typical patients at least yearly on exercise (Frank, 2003).

In a continuation of the Women Physicians' Health Study, a comparison of the women physicians in the study and a telephone survey of women in the general population were completed. In comparison with the general population, women physicians as a group were younger and included a higher percentage of Asian American than the telephone survey population. Women physicians were less likely to be married and nearly all reported incomes in the highest bracket of household income of the telephone survey population (>\$50,000) (Frank, 1998).

Comparing women physicians with women of high socioeconomic status and other women in the United States stratified the results of the comparison between women physicians and women in the general public. Women physicians were more likely than other women of high socioeconomic status and even more likely than other women to exercise. The few physicians, who reported exercising less than the ACSM guidelines, reported exercising more than the general population. Unlike women in the general population and even other women of

high socioeconomic status, women physicians' reported behaviors exceeded national goals for the year 2000 in all examined behaviors and screening habits (Frank, 1998).

In another study, 201 all male family and general practitioners, internists, and surgeons (including subspecialties), and obstetrician-gynecologists were surveyed on their personal health habits and counseling practices. One hundred fifty-one questionnaires were returned, for a response rate of 76%. 73% of the physicians that responded reported one hour or less each week of strenuous exercise. Three fourths of general family practice, surgery, and obstetrics-gynecology physicians (71%, 78%, and 73% respectively) reported that they do not get enough exercise. 67% of internal medicine physicians reported that they do not exercise enough. However, the majority of the physicians surveyed counsel some patients about their poor habits. Only 25% to 55% of physicians counsel a high percentage of all patients with poor habits; their counseling is oriented to primary prevention. About one third of physicians practice counseling that is oriented exclusively to tertiary prevention; they only counsel patients who already have disease associated with a lack of exercise. Surgeons and obstetrician-gynecologists are significantly less likely to ever counsel about weight and exercise than are nonsurgeons. In counseling surgeons are significantly less aggressive when it comes to counseling; they counsel less frequently and for fewer minutes each visit than do nonsurgeons. Overall, the study discovered that physicians with good personal exercise habits counsel their patients significantly more about exercise, regardless of their clinical specialty (Wells, 1984).

In a study by Dr. Bortz, 152 physician members of the Palo Alto Medical Clinic were given a health practice questionnaire. Most of the physicians (93%) reported that they exercise regularly. Jogging, hiking, biking, and swimming were the most common forms of exercise in the study sample. Six of the 152 had run a marathon in the previous year. A total of 27%

reported being in better physical condition than a year before, and 13% considered themselves to be the same. When broken down by gender, male physicians reported exercising regularly more than female physicians (96% and 82% respectively). However both genders reported being the same or in better physical condition in the past year equally (40%)(Bortz, 1992).

In a unique study, 441 enrolled medical students were polled on their exercise habits and knowledge of exercise and giving advice to their patients. It is important to assess these students for the obvious reason in that they are the next group of physicians to enter the work force. The medical students were more fit than published norms. Seven percent of students reported that they had not exercised during the proceeding year. The group as a whole averaged exercising 2.5 to 3 times per week, spending between forty and fifty minutes per session at a moderately intense level. The results of the study indicated that most subjects were in good health and most (93%) had engaged in some form of regular physical activity during the previous year. There were no reported differences in degree of physical activity between genders. On average the subjects were leaner than the general populations. Overall aerobic fitness was the area of poorest performance among the subjects. Less than 50% of the sample participated in regular aerobic exercise, while strength training and flexibility were the strongest performance areas (Peterson, 2003).

In a study produced by Emory University, 1,906 United States freshman medical students were surveyed on their personal and clinical exercise-related attitudes and behaviors.

Physicians' personal habits strongly affect their patient counseling practices and specifically that physicians' personal exercise habits affect their patient counseling about exercise (Frank, 2003). Few studies have explored the relationship between exercise and medical students and this study focused specifically on the students' regular physical activity and their perceived relevance of

exercise counseling to their future practice. Out of the population surveyed, women had significantly lower median body mass indexes than men 21.2 vs. 23.7 kg/m². 26.5% of men and 8.2% of women reported overweight. Obesity was reported by 4.5% of men and 2.0% of women (Frank, 2004).

These orienting freshmen reported a median of 314 min/week (45 min/day) of exercise. 64% of students complied with exercise recommendations. In comparison, nationally, approximately 15% of 20-29 year old engaged in no leisure time physical activity, and approximately half engaged in leisure time physical activity less than three times per week. Essentially all (99.4%) reported exercising at a level of mild exertion or higher in a typical week, and 97.6% engaged in some (at least 10 min per week) moderate or vigorous exercise. Higher levels of compliance with exercise recommendations were achieved by non-Hispanic Whites (67.3%) and Hispanics (68.9%) as compared to Asians (55.2%) and non-Hispanic Blacks (52.2%), men (66.6 vs. 60.2% for women), those who reported better general health (74% for those reporting excellent health vs. 62.5% and 43.6% for those reporting very good and good, fair, or poor health respectively) and better physical health (67% for those with 0 days, 61.4% for those with 1-3 days, and 58.5% for those with >3 days of not good days of physical health in the previous month), and those who stated that their families had encouraged good exercise habits (69.4% of those who agreed vs. <56% for others). Relationship status, having children, having more days of poor mental health in the prior month, family or personal histories of diabetes or obesity, and a physicians' promotion of prevention were not significantly related to exercise compliance nor were intended specialty or perceived relevance of exercise counseling. Exercise compliance was higher among those who reported excellent health, had families who encouraged

exercise, and men who wanted to become specialists, as opposed to their counterparts. Asians had lower compliance rates than did non-Hispanic Whites (Frank, 2004).

Most of the freshmen in this study (79%) believed it would be highly relevant to their future practices to counsel patients about exercise. The study showed higher percentages of those who believed in the relevance of exercise counseling (82% women vs. 76.9% men), had excellent general health (82.8% of those reporting excellent health vs. 77.4%), had personal physicians who had emphasized good exercise habits (81% vs. <78% for others), and intended to become primary care physicians (85.2% vs. 75.6% of those interested in non-primary care specialties, and 72.9% of undecided students). Those who believed exercise would be more relevant to their future practices were somewhat more likely to comply with exercise recommendations. Freshman who reported believing exercise counseling to be highly relevant to their future practices exercised about 20 min more per week than those who perceived exercising counseling only to be somewhat or not relevant. Those who planned to practice primary care were in excellent health, had personal physicians who had emphasized prevention, and exercised strenuously at the median level or higher were more likely to perceive exercise as highly relevant to medical practice (Frank 2004).

There have been several studies that have explored the prevalence of physicians' exercise prescribing habits. There has been an increased recognition amongst health professionals of the benefits of physical activity and exercise to health along with calls for primary care physicians to address physical activity and other behavioral risk factors. However a major challenge is to improve the generally poor understanding of doctors in this area. Most recent reviews have emphasized that interventions in the primary care setting may make an important contribution to the promotion of physical activity, but significant barriers exist. Among those barriers, lack of

knowledge, the need to promote greater attention to physical activity in primary health care, lack of time, poor resources, and a perceived lack of patient interest are the most commonly cited (Hills, 2003).

Health care professionals should prescribe physical activity to prevent and treat cardiovascular disease, according to an American Heart Association (AHA) scientific statement released in June 2004. The lead author of the statement, Dr. Paul Thompson, stated that “ We (AMA) feel physical activity as a treatment is under-recommended by physicians”. The statement also recommends physicians and health-care providers: 1) become physically active so they can be role models and to understand how to overcome issues involved in maintaining an active lifestyle, 2) use their influence as community members to encourage schools to develop physical education programs that encourage maintaining physically active lifestyles, 3) include patients’ physical activity as part of their medical history, 4) provide an exercise prescription for patients, 5) encourage patients to engage in a variety of physical activities and to progressively increase their activity as tolerated, and 6) advocate exercise in their communities by encouraging an environment in which people can exercise easily, including bike and walking paths, safe routes to walk to school, and gymnasiums open in the evening (Thompson, 2003).

The United States Preventative Services Task Force and Healthy People 2010 recommend that physicians and other health care providers include counseling on physical activity during routine office visits. In the U.S. Physical Activity Study 1818 adults nationwide were surveyed. Three-quarters reported that they saw a doctor for regular health care. Regular physical activity promotes health and prevents disease; yet only slightly more than 25 percent of the adults surveyed reported receiving advice from their doctors to exercise more often. Of those respondents who had been told to increase their physical activity, only 40 percent reported that

their health care provider had helped them to devise an exercise plan or had offered follow-up support during a later office visit. It was discovered that health care providers were more likely to recommend exercise to certain adults. In general, women, older patients, nonwhites, patients with a regular doctor, those with four or more visits, and those with multiple chronic illnesses were more likely to have received advice to increase physical activity (CDC).

In one study by Lewis, a random stratified sample of members and fellows of the American College of Physicians in 21 regions were selected to represent all areas of the United States, and were distributed a questionnaire inquiring about exercise habits and their counseling practices regarding exercise. More generalists than specialists counseled all patients at risk about exercise. Among the physicians that counseled, 48.5% spent over three minutes counseling about exercise. With respect to the physicians' personal exercise habits, 38.7% were either extremely or quite active whereas only 18.2% described themselves as not very active. For exercise, 41% of those internists who were quite or extremely active compared with 28% of less active internists counseled all inactive patients. It was also discovered that the physicians' perceived effectiveness in changing patients' behaviors affected counseling habits. Those who perceived themselves to be very or moderately effective were more likely to counsel for three or more minutes those patients who were at risk (Lewis, 1991).

In Glasgow, despite the evidence supporting the numerous benefits of physical activity in preventing chronic health condition, only 22% to 48% of patients receive advice from their physicians to increase their levels of physical activity. The three leading barriers to exercise prescription by physicians were found to be 1) inadequate time for dedicated patient education and counseling to encourage physical activity, 2) lack of necessary skills and tools for providing such counseling, and 3) lack of reimbursement from health insurance and managed health plans

for physical activity related preventative health maintenance and treatment programs. An assessment of the effectiveness of advice in routine primary care consultations concluded that brief and sporadic counseling during routine office visits was not an effective means of producing sustained increases in physical activity (Glasgow, 2001).

Similar results were discovered in Williford. 168 physicians were surveyed to determine their attitudes and practices related to exercise and the development of exercise prescriptions. The majority of the physicians (91%) encouraged their patients to participate in regular exercise, while 9% did not promote exercise. Less than one-half of the physicians (49%) required a review of exercise history as part of the initial examination. Approximately one-third developed exercise prescriptions for their patients, whereas 70% of the physicians reported that this was not part of their normal practice. Only 23% of the sample were familiar with the ACSM guidelines for exercise in healthy adults, and 3% had ever taken a college-level course related to exercise and the development of exercise prescriptions. However, the majority of physicians (78%) felt that there was a definite need in medical school for a course related to the medical aspects of exercise. Thirteen percent of the physicians had staff members whom they indicated developed exercise prescriptions for their patients. When asked to whom the physicians referred their patients in order to recommend an exercise program, physical therapists ranked first (68%), other physicians second (20%), exercise physiologists third (9%), and nurses fourth (3%). When asked if patients were referred to them to develop exercise programs for health promotion, 4% received referrals while 96% did not (Williford, 1992)

It was further discovered that 51% of the generalists and 43.5% of the specialists counseled their patients about exercise. There was also a correlation with internists who were more physically active counseled a greater percentage of patients than internists who were less

active, and the internists who spent more time counseling perceived themselves to be more effective in changing patients habits. The possible reasons for not counseling patients may be related to lack of confidence in counseling patients, lack of insurance reimbursements, lack of education related to the medical aspects of exercise, and lack of standard formats for assessing and prescribing exercise (Williford, 1992).

Although many studies have been conducted on the potential benefits of exercise as indicated by the above review, very few have researched the exercise habits of the medical population as compared to the general population. Even fewer studies have considered the exercise habits of the medical professionals and their prescribing habits. The vast majority of the studies that have been conducted on the exercise habits of health care providers have been limited to primary care physicians both male and female. The purpose of this study is to compare the exercise habits of health care providers in all disciplines to the general population and to evaluate the role of the health care providers' personal exercise habits on recommendations for patient exercise. It is predicted that the medical population participation in exercise is the same as the general population.

Methodology

The study was conducted using a survey as a tool to collect the desired information. Two surveys were constructed. The first was designed to survey the medical population that has contact with patients at the Medical University of Ohio. This group included doctors, physician assistants, nurse practitioners, nurses, LPNs, physical and occupational therapists, and students (Appendix A). The second survey was distributed to randomly selected residents in the Greater Toledo phone book (Appendix B).

After approval from the Institutional Review Board, the survey of the medical population was distributed using the Perseus computer program to all students, faculty, staff, and employees with an email account at Medical University of Ohio. The surveys were distributed on July 27, 2005 to each person's email box with an attached cover letter explaining the purpose and the confidentiality of the survey. The participants were asked to answer the survey only if they had direct patient contact. The Perseus computer program is a program designed for survey research, which allowed the participants' answers to be returned to the researcher without any identifying information. The program assures complete privacy and confidentiality of the participants' responses.

The surveys distributed to three hundred randomly selected individuals to represent the general public were mailed on July 15, 2005 to each persons' mailing address with an attached cover letter explaining the purpose and the confidentiality of the survey, along with a self-addressed stamped return envelope. Participants were asked to fill out the survey only if they were older than eighteen years of age. Participants of both groups were instructed to complete the survey as accurately as possible and to either mail the survey back in the self addressed envelope or to submit their survey through the Internet.

The survey tool was used to research the habits and attitudes of exercise among the medical community and the general population. The medical population survey also explored the exercise prescription habits of the medical providers. The survey for the general population had twenty-one questions. The first section covered demographics and the second section assessed the individuals personal exercise habits and their attitudes toward exercise. The last section inquired about exercise information and their attitudes towards their physicians and their exercise suggestions.

The second survey to the health care professionals had twenty-nine questions. The first section covered demographics and health care specialty. The second section focused on the physicians personal exercise habits and their attitudes toward exercise. The last section questioned the physicians' exercise prescribing habits to their patients.

The information collected from the surveys was placed in the Excel program for Windows. The data was compared by using the Chi-Square test. Statistical significance was defined as $P < 0.05$. The information obtained was used to compare the exercise habits and attitudes between the health care professionals and the general population. Personal exercise habits and attitudes will also be compared between the different health care professional and their exercise prescription habits. The exercise habits of the general population were assessed by the individual's age, income, work habits, education, and gender

Results

One hundred and one out of three hundred surveys (33.7%) from the general population were returned. Of the one hundred and one surveys there were 55 females and 47 males that responded. Of the one hundred and one participants, more than half (53%) participate in some form of aerobic exercise, and 46% participate in resistance exercise at least once a week. Thirty-one of the fifty-five females (56.4%) that responded reported that they exercised at least once a week. In comparison, twenty-three of the forty-seven males (48.9%) participated in exercise. Of the fifty-five females, twenty-two out of fifty five (55%) reported participation in resistance exercise, while twenty-five of the forty-seven males (53.2%) reported weekly resistance exercise sessions (Figures 1 and 2).

Eighty-three out of the one hundred and one participants reported that they would take medical professionals advice about exercise. Of the one hundred and one surveys only fifty (49.5%) have been given advice or had discussions with their medical provider about aerobic and resistance exercise. Of those fifty that have been counseled on exercise, 0.1% were counseled by their cardiologist. 42% were given advice from their primary care doctor. Internal medicine specialist provided for .04% of the professionals that have provided exercise counseling and physical therapist account for 0.1%. 50% of those that have been counseled did not provide an answer as to who gave them advice.

When asked about where the participants received their information about exercise, the majority (33.7%) reported finding their exercise information in a magazine or newspaper. 21.8% reported receiving aerobic and resistance exercise information from a friend or family member. 19.8% received information from their health care provider and 7.9% receive their information

from television. 10.9% reported that they did not get information from anyone or anywhere and .99% were provided exercise advice from their personal trainer (Figure 3).

The participants were asked to estimate the amount of time spent in an aerobic exercise session. 4.9% reported their sessions lasted 0-15 minutes. 10.9% exercised for 16-30 minutes. 18.8% reported exercising for 31-45 minutes. 11.9% exercised for 46-60 minutes and 6.9% reported an average exercise session lasted 61 minutes or more. 46.5% chose to not answer the question due to lack of participation in exercise. Participants were also asked to estimate the amount of time spent in a resistance exercise session. 7.9% reported their sessions lasted less than 15 minutes. 15.8% participated in a resistance session from 16-30 minutes. Another 15.8% reported their resistance exercise sessions lasted 31-45 minutes. 6.9% had sessions that lasted 46-60 minutes and only 0.99% participated in resistance exercise session for more the 60 minutes (Figure 4).

The frequency of aerobic and resistance exercise sessions, expressed as days per week, was assessed. Five out of the one hundred and one surveys (4.9%) and 8 out of the one hundred and one participants (7.9%) participated in aerobic and resistance exercise respectively, five or more days per week. Thirty-one of the one hundred and one participants (30.7%) exercise three to four days a week and twenty-two (21.8%) of those surveyed reported participating in resistance exercise three to four days a week. Eighteen of the one hundred and one surveys (17.8%) reported participating in aerobic exercise one to two days a week and twenty-one (20.8%) of the participants reported completing resistance exercise one to two days a week. Five participants of those surveyed (4.9%) and two of the participants (1.9%) reported no aerobic exercise or resistance exercise respectively, at all during the course of one week (Figure 5).

The participants were asked their average income and a comparison was completed between income level and the participants aerobic and resistance exercise participation. Of those surveyed, ten were found to earn less than \$15,000 a year. Seventy percent reported participating in aerobic exercise and resistance exercise. Twenty of the one hundred and one participants earn \$16,000 to \$30,000 a year. Thirty percent report regular aerobic exercise and thirty-five percent report regular resistance exercise. Twenty-eight of the surveys claim to earn \$31,000 to \$45,000 a year. Of the twenty-eight surveys, 14 (50%) report participating in aerobic exercise and 9 (45%) complete regular resistance exercise session. Fifteen of the participants reported making \$46,000-60,000. Nine of the fifteen (60%) aerobically exercise and eight of the fifteen (53.3%) participate in resistance exercise. Twelve of the one hundred and one surveys state their average income is between \$61,000 and \$75,000. Nine of the twelve (75%) aerobically exercise weekly and eight of the twelve (66.7%) claim to complete some form of resistance exercise. Only six of those surveyed have an average yearly income of \$76,000 to \$90,000. Three of the six in this income bracket (18.8%) participate in aerobic exercise and four of the six (66.8%) report resistance exercises on a weekly basis. Lastly, nine of the one hundred and one participants state their average income in greater than \$90,000. Of those in this group, six (66.7%) report aerobic and resistance exercise participation (Figure 6).

The population sampled was surveyed on the highest amount of education they have achieved. Four surveys of those returned have had some high school education. Of those, seventy-five percent aerobically exercise and fifty percent admit to resistance exercise. Sixteen on the one hundred and one surveys have completed high school. Thirty-one percent admit to aerobic exercise on a weekly basis and thirty-seven percent report participating in resistance exercise. Twenty of the surveys have completed at least some college. Forty percent of those

with some college or technical education participate in aerobic exercise and fifty percent admit to weekly resistance exercise. Forty-six of the participants have completed their college or technical degree. Of the forty-six surveys who have completed a college or technical degree, 65.2% aerobically exercise on a weekly basis and 47.2% report participation in resistance exercise. Lastly, fifteen of the surveys returned have completed a Masters degree. 60% of the participants with a Masters degree report participating aerobic and resistance exercise (Figure 7).

Participants were asked to report the average hours worked in a week and a comparison between hours worked and participation in aerobic and resistance exercise was completed. Of the one hundred and one surveys, twenty-one reported working less than fifteen hours a week. 66.7% of those that work less than fifteen hours a week report aerobically exercising, while 57.1% report resistance exercise participation. Thirteen of the surveys returned admit to working 16-30 hours a week. 46.2% of the population working 16-30 hours a week participate in aerobic exercise and 53.8% do some form of resistance exercise. Thirty-two of the one hundred and one surveys work between 31-45 hours a week. Fifty percent of those that work 31-45 hours a week aerobically exercise and thirty-four percent participate in resistance exercise. Ten of the surveys admit to working 46-60 hours a week. Seventy percent of this group aerobically exercises and one hundred percent admit to weekly resistance exercise session. Only five surveys report working more than sixty-one hours. One hundred percent of the individuals who report working greater than sixty-one hours admit to participating in aerobic and resistance exercise. Six surveys of the one hundred and one are retired. Sixty-seven percent aerobically exercise and one hundred percent performing some form of resistance exercise (Figure 8).

Ten of the one hundred and one surveys were between ages eighteen and twenty-four. Thirty percent of this population was male and seventy percent were female. Seventy percent

report aerobically exercising and fifty- percent report participating in resistance exercise. Only one percent of the ages 18-24 reported that they have been giving advice from a doctor about exercise. Ten percent have had some high school education, twenty percent have attained some college or technical school, sixty percent have achieved a college or technical degree, and ten percent of those 18-24 have been awarded a Masters degree or higher. Twenty percent of 18-24 year olds earned less than \$15,000 a year. Thirty percent earn \$16,000-30,000, twenty percent earn \$31,000-45,000, twenty percent earn \$46,000-60,000, and ten percent earn \$61,000-75,000. Forty percent of those age 18-24 work less than fifteen hours a week. Thirty percent report working 31-45 hours, twenty percent work 46-60 hours a week and ten percent work greater than sixty-one hours. When questioned about excuses or barriers to aerobic exercise and resistance exercise, fifty percent report not enough time as a major barrier. Thirty percent site lack of motivation as the barrier to exercise and twenty percent state other reasons prevent participation in exercise.

Fifteen of the one hundred and one participants are aged 25-35. Forty percent are male and sixty percent are female. 53.3% report aerobically exercising and 46.7% admit to performing some form of resistance exercise. 13.3% responded that they have received exercise advice and counseling from their doctors. 13.3% have completed a high school degree. 13.3% have attended some college or technical school. 53.3% have attained a college or technical degree and 20% have received a Masters degree or higher. 53.3% of those aged 25-35 reported earning \$31,000-45,000, 13.3% earned \$46,000-60,000, twenty percent earned between \$61,000-75,000, 6.7% reported earning \$75,000-90,000, and 6.7% earned greater than \$90,000. When asked about average hours worked during the week, 6.7% responded that they worked less than fifteen hours a week. Another 6.7% reported working 16-30 hours, 46.7% worked 31-45 hours,

20% worked 46-60 hours, 13.3% reported more than sixty-one hours of work a week, and 6.7% reported being retired. In response to the question of reasons to not participate in exercise or resistance training, 60% stated that not enough time was the biggest barrier. 33.3% responded that lack of motivation was a barrier, and 6.7% reported that there was no barrier to exercise.

Thirty-three of the surveys returned fell into the age group 36-45. Fifty-seven percent of those ages 36-45 were males and 42.4 percent were females. 42.4% aerobically exercise at least once a week and 51.5% admitted to participation in resistance exercise. 45.5% of those 36-45 have received advice from the doctor about aerobic and resistance exercise. Three percent have had some high school education. 15.2% have achieved a high school diploma. 21.1% of this age group have had some college or technical school education and 48.5% have received a college or technical school diploma. 12.1% have a Master's degree or higher. 3.0% of those aged 36-45 reported earning less than \$15,000 a year, 18.2% earned \$16,000-30,000, 30.3% reported earning \$31,000-45,000, 9.0% earned between \$46,000-60,000, 9.0% reported earning \$61,000-75,000, 15.2% have earned \$76,000-90,000, and 12.1% reported earning an annual income of greater than \$90,000. In response to the question about hours worked, 8.2% reported working less than fifteen hours a week, 18.2% work 16-30 hours a week, 36.4% work 31-45 hours, 21.1% work 46-60 hours a week, and 6.1% reported working more than sixty-one hours a week. When asked about the greatest barrier to exercise, 39.4% stated that not enough time was the main reason they did not exercise. 36.4% cited lack of motivation, 6.1% state they are physically unable to exercise, and 6.1% reported other reasons as barriers to exercise. 6.1% of those ages 36-45 state that there are no barriers that prevent them from exercising.

Twenty-two of the one hundred and one survey returned was ages 46-55. 31.8% were male and 68.2% were female. 59.1% reported participation in aerobic exercise and 54.5 percent

stated they perform some type of resistance exercise. 72.7% of those 46-55 have received exercise advice and counseling from their physicians. 9.1% of this population have received a high school diploma. 31.8% has had some college or technical schooling. 54.5% received a college or technical school diploma. Lastly, 4.5% have a Master's degree or higher. 9.1% of those ages 46-55 reported earning less than \$15,000, 27.3% earned \$16,000-30,000, 18.2% reported earning \$31,000-45,000, 7.3% earned \$46,000-60,000, 9.7% reported earning \$61,000-75,000, and 9.1% earned greater than \$90,000. When asked about average hours worked, 22.7% reported working less than fifteen hours a week. 9.1% worked 16-30 hours, 36.4% worked 31-45 hours, 18.2% reported working 46-60 hours, and 13.6% were retired. In response to question on reasons to not participate in aerobic or resistance exercise, 63.6% reported not enough time as the greatest barrier. 22.7% cited lack of motivation as a barrier, 4.5% were physically unable to exercise, and 9.1% reported other reasons as barriers to exercise participation.

Only nine of the one hundred and one surveys returned fell between ages 56-65. 44.4% were male and 55.5% were female. 66.7% reported aerobic exercise participation and 55.5% stated they participated in resistance exercise. 66.7% of those aged 56-65 have received exercise advice and counseling from their physician. 11.1% has had some high school education. 44.4% received a high school diploma. 33.3% graduated from college or technical school, and 11.1% have a Master's degree or higher. 33.3% of those aged 56-65 reported earning less than \$15,000 a year. 11.1% earned \$16,000-30,000, 22.2% reported earning \$31,000-45,000, 22.2% earned between \$61,000-75,000, and 22.2% earned greater than \$90,000. When asked about average hours worked a week, 33.3% reported working less than fifteen hours a week. 22.2% worked 16-30 hours, 22.2% worked 31-45 hours, 22.2% were retired. In response to the question of the

most common barrier to exercise participation, 22.2% stated not enough time, 55.5% believed that lack of motivation prevents them from exercising, and 22.2% were physically unable.

Twelve of the one hundred and one surveys were greater than sixty-six years of age. Fifty percent were female and fifty percent were female. 41.7% reported aerobically exercising at least once a week and 50% reported participation in resistance exercise. 83.3% of those greater than 66 years of age have received exercise advice and counseling from their physician. 8.3% of this group has some high school education. 25% received a high school diploma, 16.7% had some college or technical school, 8.3% attained a college or technical school degree, and 41.7% had a Master's degree or higher. 16.7% of those aged sixty-six or greater reported earning less than \$15,000 a year. 33.3% earned \$16,000-30,000, 16.7% earned \$31,000-45,000, 16.7% reported earning \$46,000-60,000, and 16.7% earned \$61,000-75,000. When asked about hours worked a week, 16.7% reported working less than fifteen hours a week. 16.7% worked 16-30 hours, and 66.7% reported being retired. In response to the question posed about the greatest perceived barriers to exercise participation, 41.7% reported lack of motivation as their greatest barrier. 41.7% reported physical inability as a major barrier, 8.3% cited other reasons as barriers to exercise. 8.3% of those 66 years or older reported no barriers to exercise.

Three hundred and ten of the six hundred surveys (51.7%) emailed to the medical community were returned. 67% of the returned surveys were female and 33% were male. 67.7% of the medical population reported aerobically exercising (Figure 9), and 43.9% reported participation in resistance exercise (Figure 10). 14.5% participated in aerobic exercise more than five times a week, 37.1% three to four days a week, 32.9% one to two days a week, and 14.2% of the medical population reported no exercise at all during the week. In comparison, 2.6% of the medical population reported participation in resistance exercise greater than five times a week.

19.0% performed resistance exercise three to four days a week, 30.3% one to two days a week, and 41.6% reported no resistance exercise session (Figure 11). 13.9% of the medical community reported aerobically exercising less than fifteen minutes a week. 23.5% exercised between 16-30 min, 29.0% exercised 31-45 min, 20.3% participated in aerobic exercise session for 46-60 min, and 8.1% exercised greater than sixty-one minutes each session. 33.9% of the surveyed medical population reported resistance exercise session less than fifteen minutes. 21.6% had resistance exercise sessions between 16-30 minutes, 12.5% performed resistance exercise for 31-45 minutes, 9.0% had resistance exercise sessions 46-60 minutes, and 4.2% reported their resistance exercise sessions lasting longer than sixty-one minutes (Figure 12).

46.1% of the medical community reported not enough time as a major barrier to aerobic exercise participation. Another 46.1% cited lack of motivation as a primary barrier, 3.2% reported physical inability as a major barrier, and .65% stated they do not believe aerobic exercise was beneficial to their health. 14.2% reported other reasons as a barrier to exercise (Figure 13). The major barriers for resistance exercise were not enough time (66.1%), lack of motivation (34.2%), physically unable (4.5%), and other (8.0%). 2.3% of the medical population surveyed reported the major barrier to resistance exercise was lack of belief that it is beneficial to health and wellness (Figure 14).

Fifty-two percent of the surveys were classified as students. Forty-eight percent of the medical population that responded was non-students. 76% of the students reported participation in exercise and 59.1% of non-students participated in exercise. The most common types of aerobic exercise among those in the medical community were running (30.5%), jogging (11.9%), walking (73.8%), swimming (17.1%), biking (38.6%), aerobics (27.1%), rowing (3.3%), and sports (basketball, racquetball, football) (39.5%) (Figure 15).

Of the three hundred and ten surveys returned, seventy-four surveys reported being a doctor (M.D and D.O.). Of the seventy-four doctors cardiology (9), emergency medicine (6), surgery (13), family practice (16), pediatrics (8), internal medicine (12), ob/gyn (8), dermatology (1), and geriatrics (1) were the services that responded. 44.4% of cardiologist reported exercising. 66.7% of emergency medicine physicians exercise. 61.5% of surgical physicians reported exercising on a regular basis. 75% of family practice doctors exercise regularly. 87.5% of pediatric physicians exercise and 58.3% of internal medicine doctors report regular exercise. 37.5% of Ob/Gyn physicians exercised regularly, and 100% of both dermatology and geriatrics physicians reported exercising.

77.4% of health care professionals reported recommending aerobic exercise and counseled their patients and 61.3% recommended resistance exercise to patients. 68% of health care professionals who exercised prescribe exercise to their patients. 75% of medical professionals that do not exercise recommended exercise to patients. The percentage patients that health care providers counseled on aerobic exercise during a routine check-up were as follows: 0-10% (16.8%), 11-20% (7.7%), 21-30% (7.1%), 31-40% (2.9%), 41-50% (3.5%), 51-60% (2.9%), 61-70% (2.6%), 71-80% (3.2%), 81-90 (1.6%), and 91-100% (4.8%). The percentage of patients that have received resistance exercise counseling from their health care provider on a routine basis were: 0-10% (29.7%), 11-20% (6.8%), 21-30% (4.5%), 31-40% (2.3%), 41-50% (.97%), 51-60% (1.6%), 61-70% (.97%), 71-80% (.97%), and 91-100% (3.5%) (Figure 16).

The average amount of time the health care professional devoted to aerobic exercise counseling during a routine check-up was less than one minute (13.2%), 1-2 minutes (22.6%), 3-5 minutes (17.1%), 6-10 minutes (1.6%), and greater than ten minutes (2.3%). 42.9% of health

care professionals did not answer this question indicating they did not counsel patients on aerobic exercise on a regular basis. The average amount of time the health care professional devoted to resistance exercise counseling in a routine check-up was less than one minute (21.0%), 1-2 minutes (13.5%), 3-5 minutes (7.4%), 6-10 minutes (2.3%), and greater than ten minutes (3.5%). 51.9% of the medical population surveyed did not respond to the question indicating they do not regularly prescribe resistance exercise (Figure 17).

The average frequency or times per week a health care provider suggests participation in aerobic exercise were one day (.97%), 2 days (1.3%), three days (35.2%), 4 days (11.6%), five days (5.8%), and seven days (2.3%) a week. 44.5% of the medical community did not respond to this question. The average times per week a health care professional suggests participation in resistance exercise were one day (1.9%), two days (11.3%), three days (27.7%), four days (2.3%), five days (.32%), and seven days (1.3%). 55.2 % of the medical community did not respond to the question.

The average amount of time recommended per aerobic exercise session by a health care provider was 0-15 minutes (4.2%), 16-30 minutes (29.4%), 31-45 minutes (20.6%), 46-60 minutes (1.3%), and sixty-one minutes or more (.32%). 43.9% of the health care providers did not respond to the question. The average amount of time per session recommended by a health care professional for resistance exercise was 0-15 minutes (11.3%), 16-30 minutes (25.8%), 31-45 minutes (11.6%), and 46-60 minutes (.32%). 53.5% of health care providers that responded to the survey did not respond to the question.

Health care providers were asked to assess what percentage of patients do they think follow their advice on aerobic exercise recommendations. The average percentage of patients they thought followed their advice were 0% (6.1%), 1-20% (37.1%), 21-40% (9.4%), 41-60%

(2.3%), 61-80% (.32%), and 81-100% (.64%). Forty-four percent those surveyed did not respond to the question. The average percentage of patients that health care providers believe follow their resistance exercise advice were 0% (8.4%), 1-20% (29.7%), 21-40% (3.9%), 41-60% (3.2%), 61-80% (.65%), and 81-100% (.96%). 52.9% of the medical community did not answer the question (Figure 18).

The barriers health care providers perceived to counseling aerobic exercise were not enough time (45.2%), not enough knowledge on the subject (24.5%), lack of belief that counseling is beneficial (2.6%), and other (20.3%). The barriers health care professional perceived to counseling patients on resistance exercise were not enough time (39.7%), not enough knowledge on the subject (28.7%), lack of belief that counseling is beneficial (3.9%), and other (13.5%) (Figure 19).

There were no significant differences between male and female participation in exercise in the health care providers. There was also no differences between aerobic exercise participation in males and females in the general public, however, significant differences in gender in resistance exercise in the general population ($p < .003$ with a power of .86). Among the health care professionals, students (76%) were significantly more likely to exercise than non-students (59.1%) ($p = .002$ and a power of .894).

Discussion

The study shows that the majority of health care professionals participate in regular aerobic (66.7%) and resistance (66.7%) exercise. In comparison, over half (53%) of the general population participate on aerobic exercise, while only 46% participate in resistance exercise. There was no difference between male and female participation in exercise in the health care providers and in the general public. However, there was a significant difference in gender participation in resistance exercise in that more males participated in resistance exercise than females (53% and 40% respectively). There was also a significant difference among health care professionals since students (76%) were more likely to exercise than non-students (59.1%)

The majority of the general population (82%) was willing to take their doctor's advice or counseling on exercise although, only 49.5% have ever received advice from their physician regarding exercise. Of those that have received advice and/or counseling about exercise from their physician, the majority (42%) received advice from their primary care provider. To a lesser extent, cardiologist (1%), internal medicine physicians (4%), and physical therapists (1%) were reported to have provided advice about exercise. Other than the physician as a source of information, the majority of the general public received their information from a magazine or newspaper (33.7%), followed by family or friend (21.8), and television (7.9%).

Of those that exercised in the general population, the majority reported exercising 3-4 (30.7%) days a week, for 31-45 minutes each session (18.8%). Of those that reported exercising in the medical population, the majority reported exercising 3-4 days a week (37.1%), for 31-45 minutes each session (29.0%). Walking (73.8%) was the most common form of aerobic exercise activity. The most common barrier to exercise for both the medical and general population was not enough time (66.1% and 60% respectively).

The study revealed that those in the general population who earned less than \$15,000 a year (70%) and individuals earning more than \$61,000 a year were more likely to exercise. The majority of those who exercise in the general public worked more than forty-six hours a week (greater than 70%). Lastly, individuals with some high school education (75%) and those with a college or technical school diploma and higher (65.2% and 60% respectively) were more likely to participate in exercise.

The study indicated that the majority of health care providers recommend aerobic (77.4%) and resistance exercise (61.3%) to their patients. The majority of health care providers that exercise recommend exercise to their patients on a regular basis (68%), however the majority of health care professionals that do not exercise recommend and counsel patients on exercise (75%). In a routine check-up most health care providers counsel less than ten percent of their patients on aerobic (16.8%) and resistance (29.7%) exercises. Most physicians spend less than one minute counseling patients on resistance exercise (21%) and between one to two minutes on aerobic exercise (22.6%).

For those health care professionals that recommend exercise to their patients, most recommend aerobically exercising three times a week (35.2%) for at least 16-30 minutes a session (29.4%). When recommending resistance exercise to patients, most health care providers suggest at least three times a week (27.7%) for at least 16-30 minutes a session (29.7%).

Despite providing aerobic and resistance exercise recommendations and counseling, most surveys in the medical community believe that less than twenty percent of the general population (37.1% and 29.7% respectively) follow their recommendations. Finally, the most common barriers health care providers perceive to counseling on aerobic exercise is not enough time

(45.2%) and the most common barriers that prohibits counseling patients on resistance exercise is not enough time (39.7%).

There were several limitations to this study. The participating health care providers and the general population were localized to Toledo, Ohio. The study results therefore cannot be generalized to all practicing clinicians and the general populations in all parts of the United States and other developed countries.

The study yielded a total of three hundred and ten surveys from the medical community (51.3%) and only one hundred and one surveys from the general population (33.3%). With this small population we cannot assume the results can be applied to the total number of clinicians and participants from the general community in the United States and other similar countries.

The surveyed medical community and the general population were asked to answer the questions as truthfully and accurately as possible. We cannot be certain this request was granted, and this may serve to skew the results of the survey.

Finally, there may be variation in how the surveyed general population and medical community interpreted the questions asked in the surveys. In this case, the responses given would also skew the results.

Conclusion

Exercise and its benefits have been researched time and time again. In recent years more studies have been directed toward the health care professionals' exercise habits and the effect of their habits on exercise prescription, as Americans have become more sedentary. This study demonstrates and confirms that health care providers' exercise habits and attitudes affects their exercise prescription habits. Furthermore, it has been shown that the general population as a whole has become increasingly sedentary and a need for health care providers' recommendations of exercise has become a necessity. Despite the known benefits of exercise, only 53% of the general population and only 66.7% of the medical community exercises.

Although 77.4% of the medical community reports recommending aerobic exercise and 61.3% reported recommending resistance exercise, only 50% of those surveyed in the general population report receiving exercise recommendation from their health care provider. Furthermore, 68% of health care professionals who exercised prescribe exercise to their patients and 75% of medical professionals that do not exercise recommended exercise to patients. Of the general population, 82% state they would like to receive exercise counseling from their health care provider and would follow their recommendations.

It would be beneficial for further studies to include a larger population in a wider distribution of area. Future studies should include more of each type of health care providers especially the mid-level health care workers (physician assistants and nurse practitioners) as they only represented less than four percent of the medical population yet are deeply ingrained in all aspects of patient care. Future research may also want to take a different approach to the general population as the use of the phone book excluded the population of people that have unlisted phone numbers or do not have a land phone line due to cellular phone use or lack of finances to

afford a phone. By distributing surveys at multiple supermarkets and grocery stores, a wider population of the general public may be reached; although this may be more time consuming and less participation may be achieved.

Reference List

1. Abramson, S., Stein, J., Schaufele, M., Frates, E., & Rogan, S. (2000).
Personal exercise habits and counseling practices of primary care physicians:
A national survey. *Clinical Journal of Sports Medicine*, 10(1), 40-48.
2. Amisola, R.V.B., & Jacobson, M.S. (2003). Physical activity, exercise,
and sedentary activity: Relationship to the causes and treatment of
obesity. *Adolescent Medicine*, 14(1), 23-35.
3. Blair, S.N., Kohl, H.W., Barlow, C.E., Paffenbarger, R.S., Gibbons,
L.W., & Macera, C.A. (1995). Changes in physical fitness and
all-cause mortality. *JAMA*, 273, 1093-1098.
4. Boritz, W.M. (1992). Health behavior and experiences of physicians:
Results of a survey of Palo Alto Medical Clinic physicians. *West
J Med*, 156, 50-51.
5. Burton, N.W., & Turrel, G. (2000). Occupation, hours worked, and
leisure-time physical activity. *Preventative Medicine*, 31,
673-681.
6. CDC (2001). Increasing physical activity: A report on recommendations of
the Task Force on community preventive services. *MMWR*,
50(18), 166-169.
7. Caspersen, C.J., Pereira, M.A., & Curran, K.M. (2000). Changes in
physical activity pattern in the United States, by sex and
cross-sectional age. *Medicine and Science in Sports and
Exercise*, 32(9), 1601-9.

8. Chakravarthy, M.V., Joyner, M.J., Booth, F.W. (2002). An obligation for primary care physicians to prescribe physical activity to sedentary patients to reduce risk of chronic health condition. *Mayo Clinic Proceedings*, 77(2), 165-173.
9. Cook, J., Bender, B., Senner, J., Davis, B., Left, M., Adams, M., Breukelman, F., Mitchel, C., McTague, D., Pledger, E., Cooper, J., Johnson, C., Steiner, B., Costello, N., Wineski, A., Perry, M., Asher, K., Meriweather, R., Maines, D., & Weinstein, A. (1998). Self-reported physical inactivity by degree of urbanization. *MMWR: Morbidity & Mortality Weekly Report*, 47(50), 1097-2000.
10. DiPietro, L. (1999). Physical activity in the prevention of obesity: Current evidence and research issues. *Medicine & Science in Sports & Exercise*, 31, S542-S546.
11. Droyvold, W.B., Holmen, J., Kruger, O., & Midthjell, K. (2004). Leisure time physical activity and change in body mass index: An 11-year follow-up study of 9357 normal weight health women 20-49 years old. *Journal of Women's Health*, 13(1), 55-63.
12. Fletcher, G.F., Balady, G., Blair, S.N., Blumenthal, J., Caspersen, C., Chaitman, B., Epstein, S., Frolicher, E.S., Froelicher, V.F., Pina, I.L., & Pollock, M.L. (1996). Statement on exercise: Benefits and recommendations for physical activity programs for all Americans. *AHA*, June 20, 1-14.

13. Frank, E., Brogan, D.J., Mokdad, A.H., Simoes, E.J., Kahn, H.S., & Greenberg, R.S. (1998). Health related behaviors of women physicians vs other woman in the United States. *Arch Intern Medicine*, 158, 342-348.
14. Frank, E., Galuska, D., Elon, L., & Wright, E. (2004). Personal and clinical exercise-related attitudes and behaviors of freshman U.S. medical students. *Research Quarterly for Exercise and Sport*, 75(2), 112-21.
15. Frank, E., Schelbert, K.B., & Elon, L. (2003). Exercise counseling and personal exercise habits of US women physicians. *Journal of the American Medical Women's Association*, 58, 178-184.
16. Fogelman, Y., Bloch, B., Kahan, E. (2004). Assessment of participation in physical activities and relationship to socioeconomic and health factors: The controversial value of self-perception. *Patient Education and Counseling*, 53, 95-99. 6.
17. Glasgow, R.E. (2001). Study finds doctors fail to promote physical activity. *Ascribe Health & Fitness News Service*, 5, 2.
18. Hardman, A.E. (2001). Physical activity and health: Current issues and research needs. *International Journal of Epidemiology*, 30, 1193-1197.
19. Hills, A.P. (2003). Prescription of exercise by physicians improves fitness in elderly people. *Evidence Based Healthcare: A Scientific Approach to Health Policy*, 7(4), 300-302.

20. Jakicic, J.M. (2003). Exercise in the treatment of obesity.
Endocrinology and Metabolism Clinics, 32(4), 12-30.
21. Kiningham, R.B. (2001). Cardiovascular Disease. *Clinics in Family Practice*, 3(4), 100-120.
22. Kriska, A.M., & Rexroad, A.R. (1998). The role of physical activity in minority populations. *Women's Health Issues*, 8(2), 98-103.
23. Kuczmarski, R.J., Flegal, K.M., Campbell, S.M., & Johnson, C.L. (1994). Increasing prevalence of overweight among U.S. adults. *JAMA*, 272, 205-211.
24. Lewis, C.E., Clancy, C., Leake, B., & Schwartz, J.S. (1991). The counseling practices of Internists. *Annals of Internal Medicine*, 114, 54-58.
25. MacKnight, J.M. (2003). Exercise consideration in hypertension, obesity, and dyslipidemia. *Clinics in Sports Medicine*, 22(1), 101-115.
26. McInnis, K.J. (2003). Diet, exercise, and the challenge of combating obesity in primary care. *Journal of Cardiovascular Nursing*, 18(2), 14.
27. Montague, J. (1996). Reports on the health practices of physicians in the United States including their exercise habits and dietary practices. *H&HN: Hospital & Health Networks*, 70(20), 14.
28. Mosca, L., & McKechnie, R. (2004). Physical activity goals for sedentary patients. *American Family Physician*, 69(4), 1195-1197.

29. Paffenbarger, R.S., Hyde, R.T., Wing, A.L., Lee, I., Jung, D.L., & Kampert, J.B. (1993). The association of changes in physical activity level and other lifestyle characteristics with mortality among men. *The New England Journal of Medicine*, 328(8), 538-545.
30. Paluska, S.A. (2002). The role of physical activity in obesity management. *Clinics in Family Practice*, 4(2), 20-35.
31. Peterson, D.F., Degenhardt, B.F., & Smith, C.M. (2003). Correlation between prior exercise and present health and fitness status of entering medical students. *JAOA*, 103, 361-366.
32. Saxena, R., Borzekowski, D.L.G., Rickert, V.I. (2002). Physical activity levels among urban adolescent females. *Journal of Pediatric and Adolescent Gynecology*, 15(5), 155-164.
33. Siegal, P.Z., Waller, M.N., Mariolis, P. (1993). Behavioral risk factor surveillance system: Summary of data for 1991. *MMWR*, 42(4), 23-30.
34. Smith, M. (1997, August). How FPs take care of their own health. *Modern Medicine*, 65, 1-5.
35. Thompson, P.D. (2003). AHA's new physical activity statement gets health care professionals moving. *Obesity, Fitness & Wellness Week*, July 19, 15.
36. Wells, K.B., Lewis, C.E., Leake, B., Ware, J.E. (1984). Do physicians preach what the practice?. *JAMA*, 252(20), 2846-2848.

37. Williford, H.N., Barfield, B.R., Lazenby, R.B., & Olson, M.S. (1992). A survey of physicians' attitudes and practices related to exercise promotion. *Preventive Medicine, 21*, 630-636.

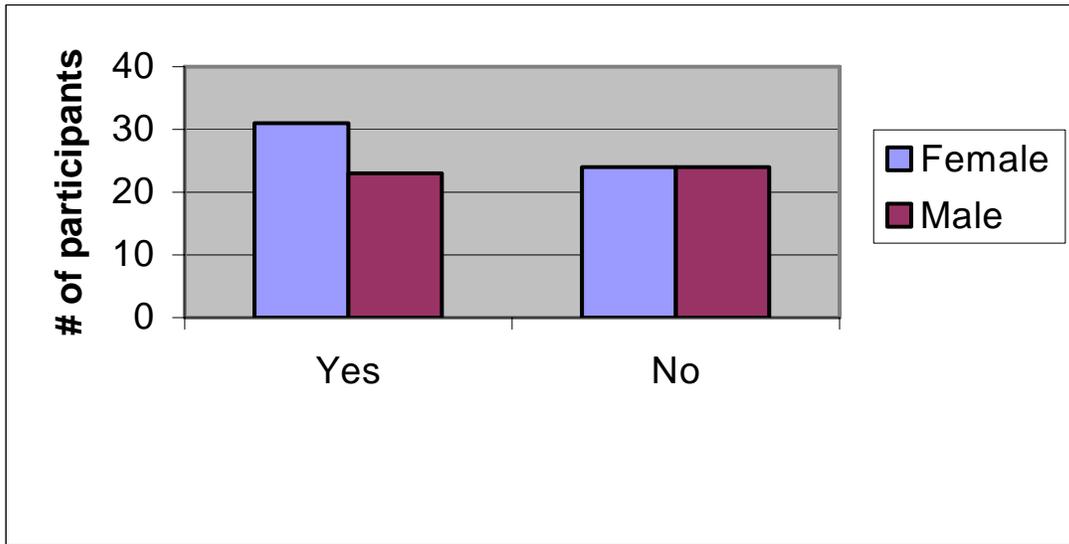
Figures

Figure 1. Participation in aerobic exercise among the general population

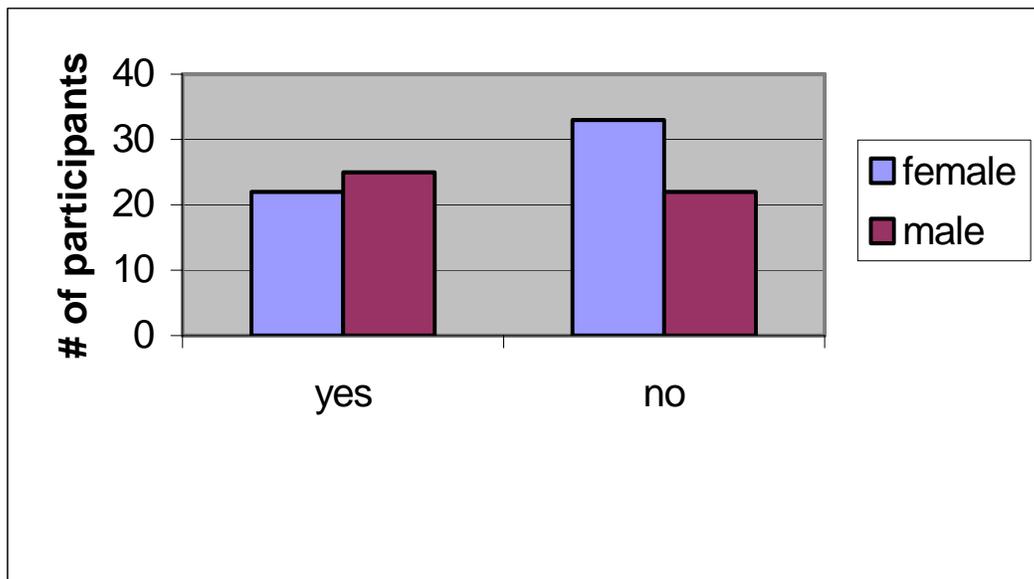


Figure 2. Participation in resistance exercise among the general population

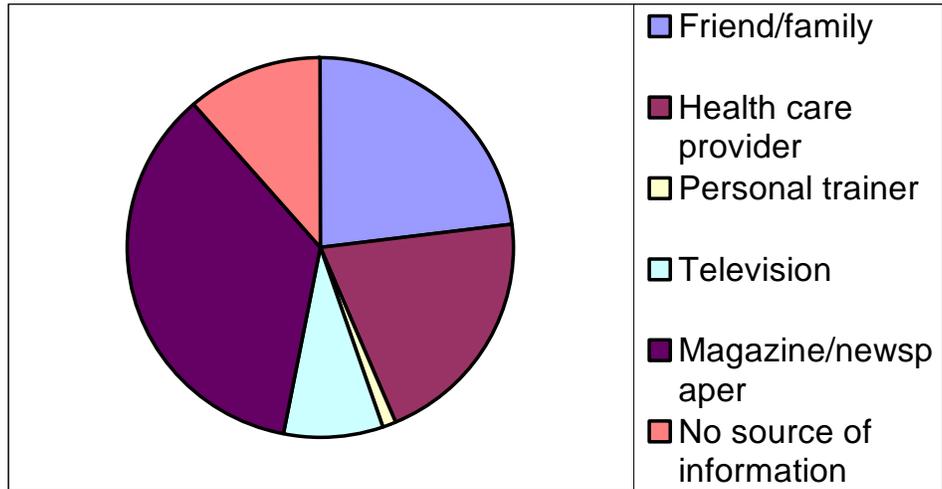


Figure 3. Where the general population received information about exercise

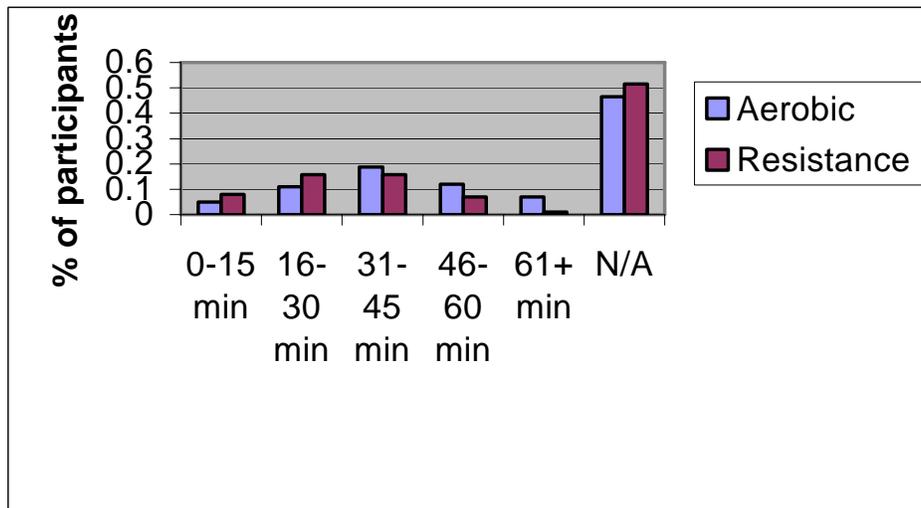


Figure 4: Time spent per exercise session among the general population

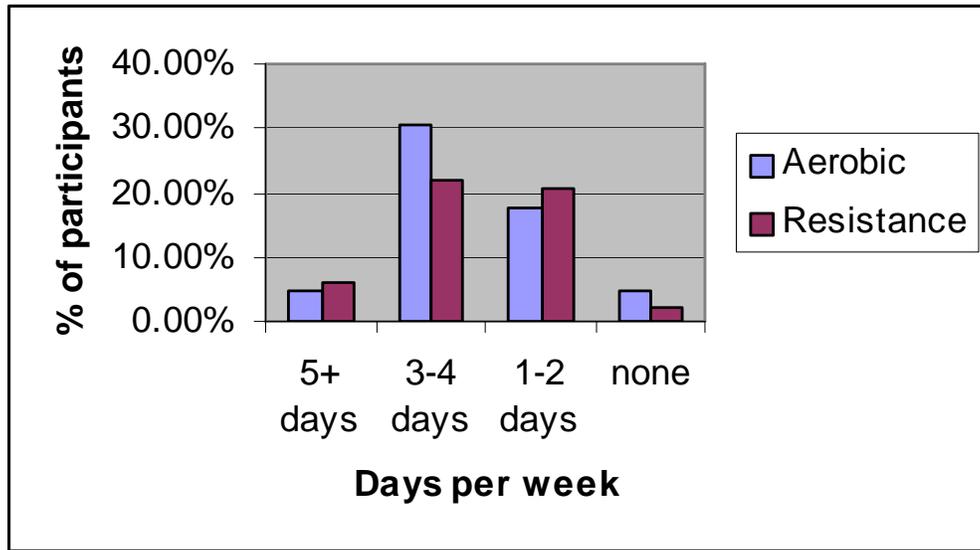


Figure 5. Frequency of exercise sessions per week among the general population

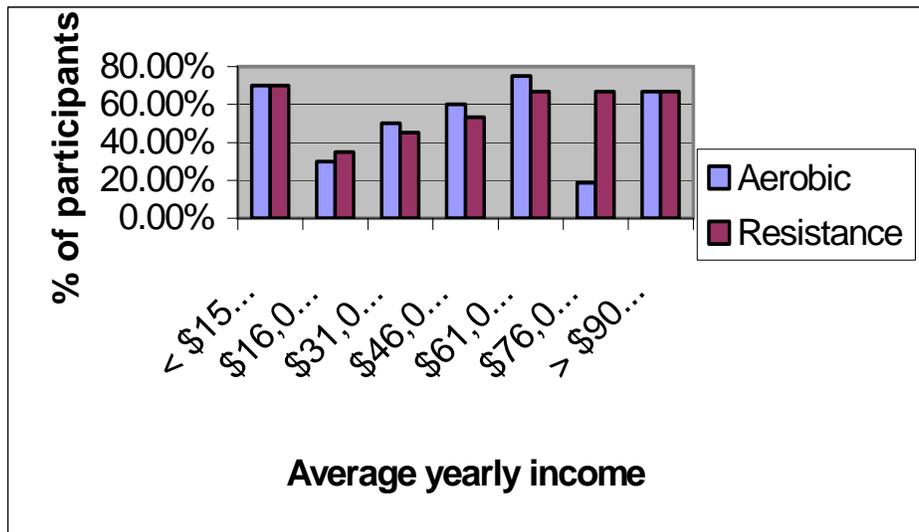


Figure 6. Average yearly income and participation in exercise among the general population

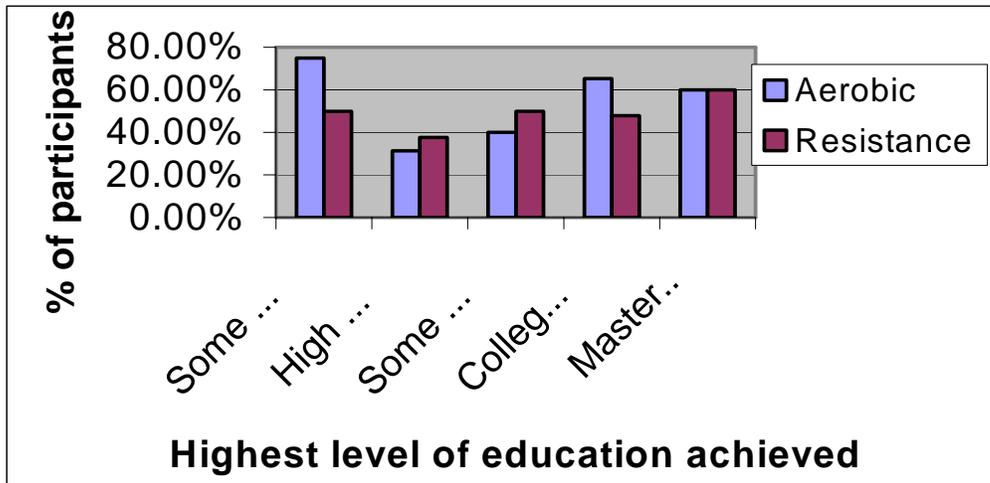


Figure 7. Education and participation in exercise among the general population

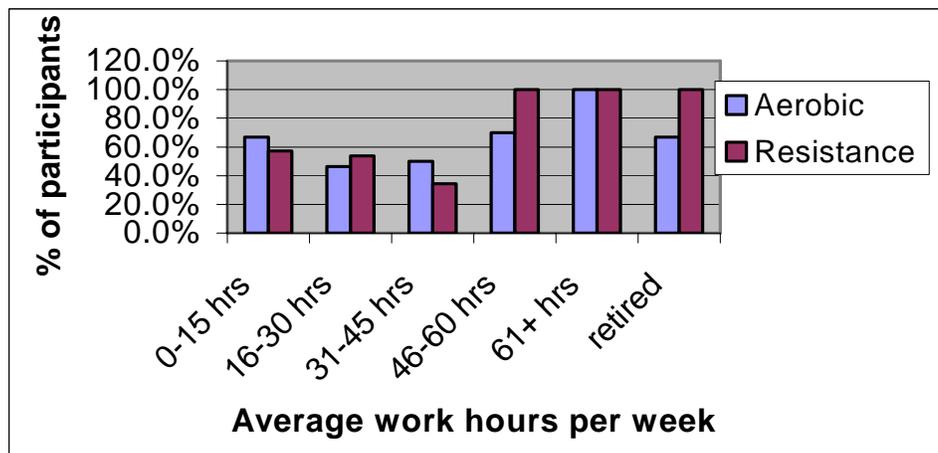


Figure 8. Average work hours per week and participation in exercise among the general population

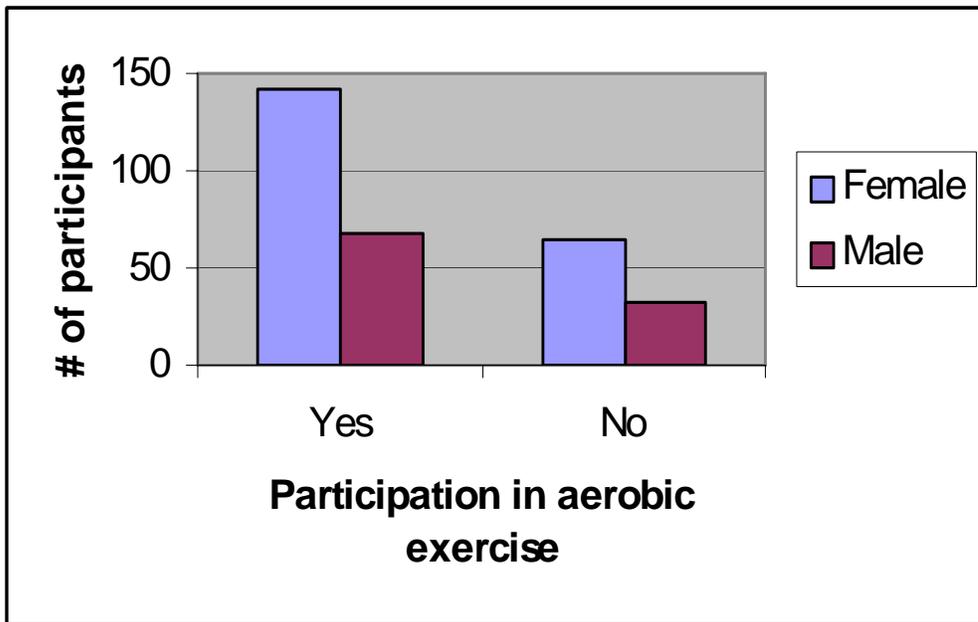


Figure 9. Participation in aerobic exercise among the medical community

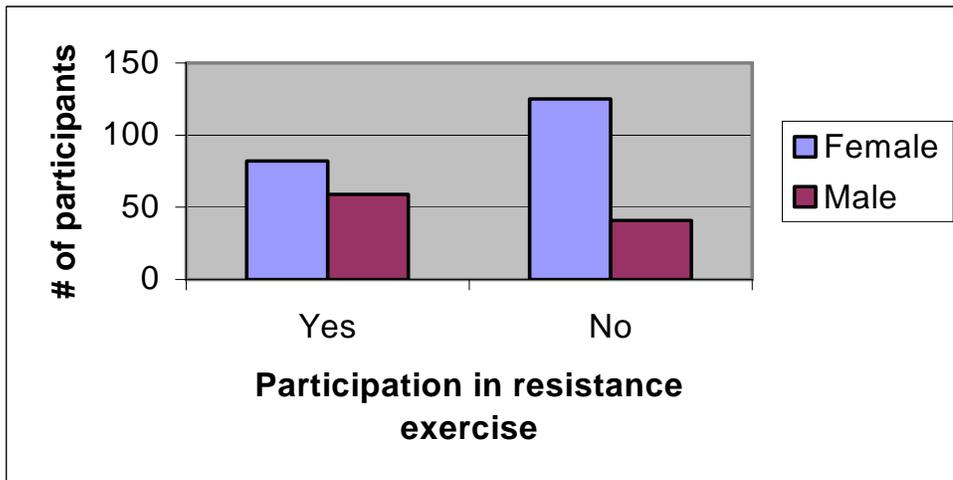


Figure 10. Participation in resistance exercise among health care providers

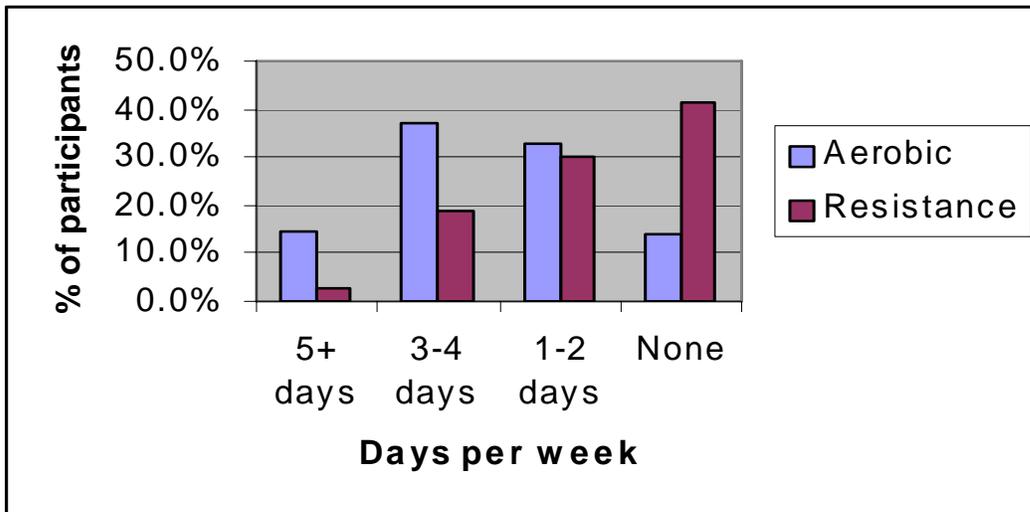


Figure 11. Frequency of exercise session per week among the medical community

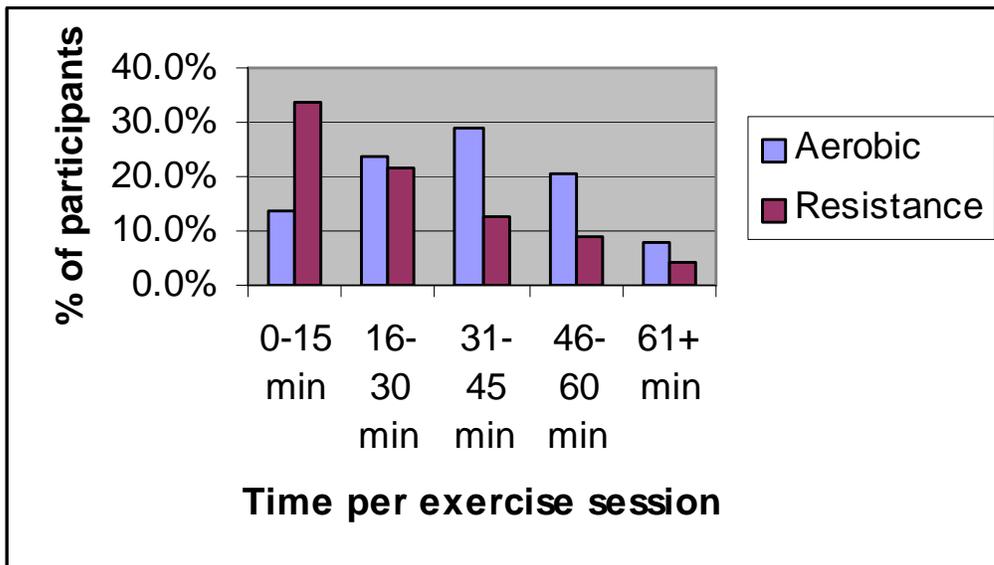


Figure 12. Time spent per exercise session among the medical community

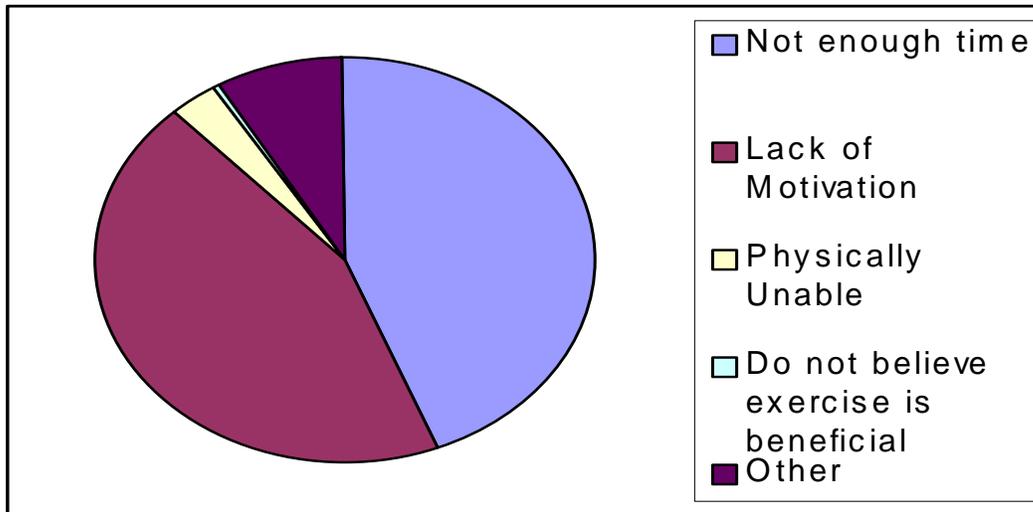


Figure 13. Major barriers to aerobic exercise perceived by the medical community

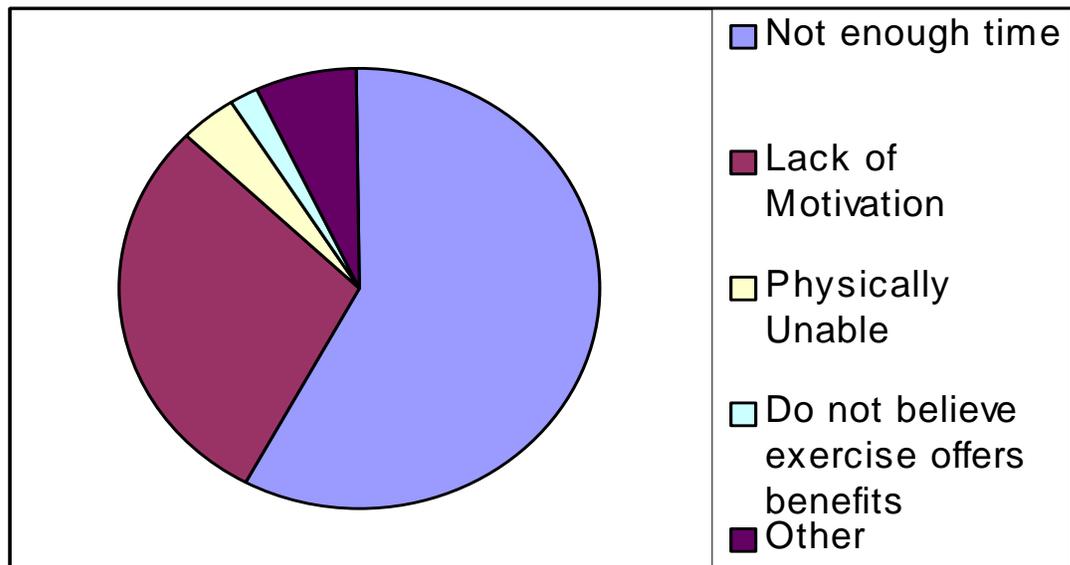


Figure 14. Barriers to resistance exercise perceived by the medical community

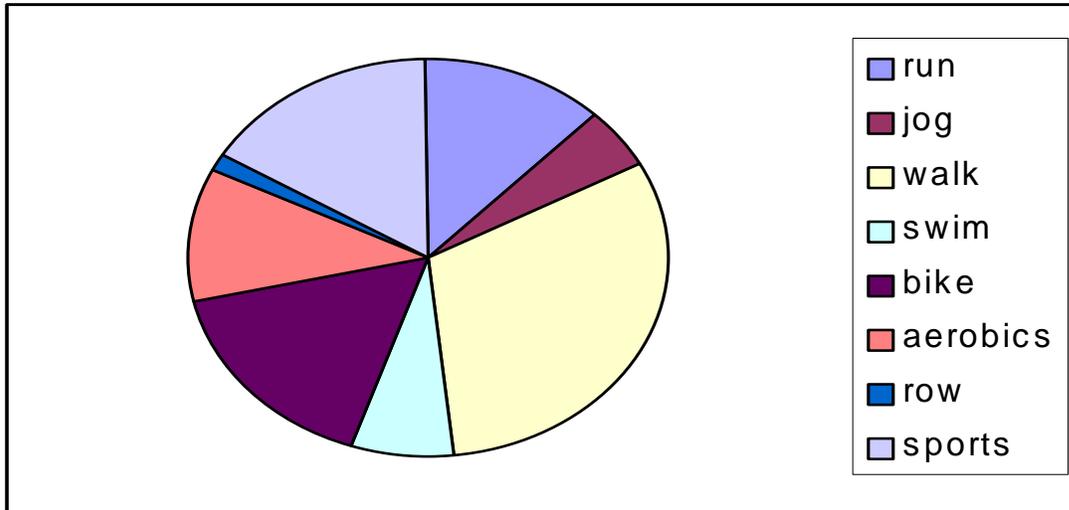


Figure 15. Most common forms of aerobic exercise among the medical community

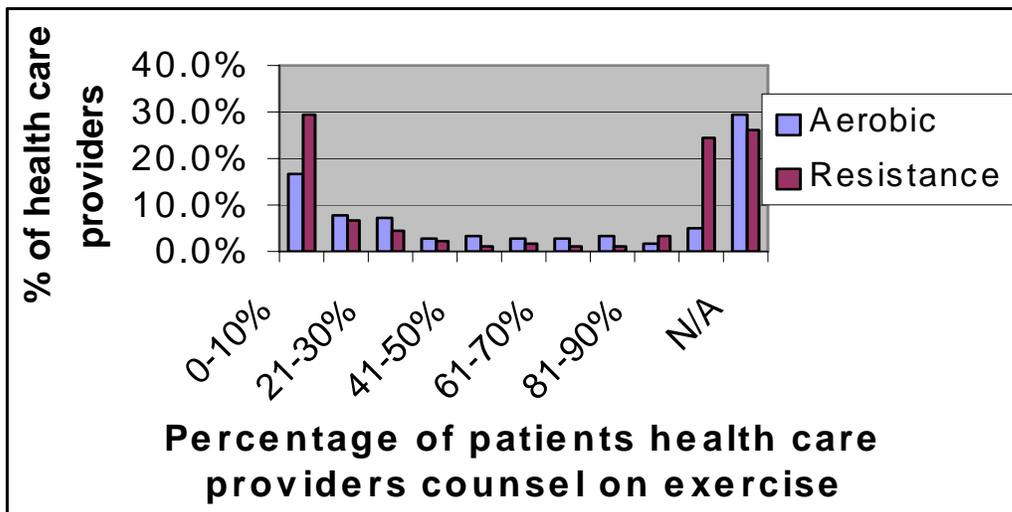


Figure 16. Percentage of patients that health care providers counseled on exercise during a routine check-up

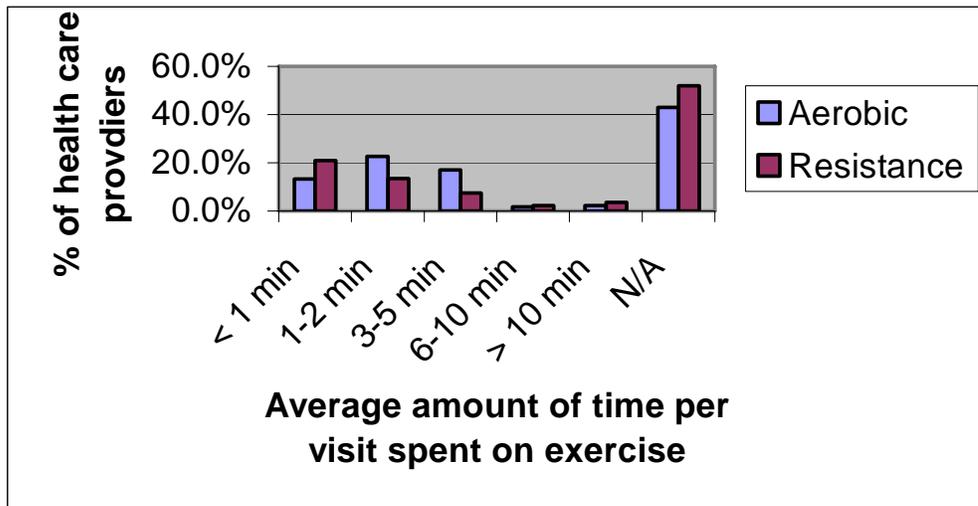


Figure 17. Amount of time per visit spent on exercise counseling by health care provider

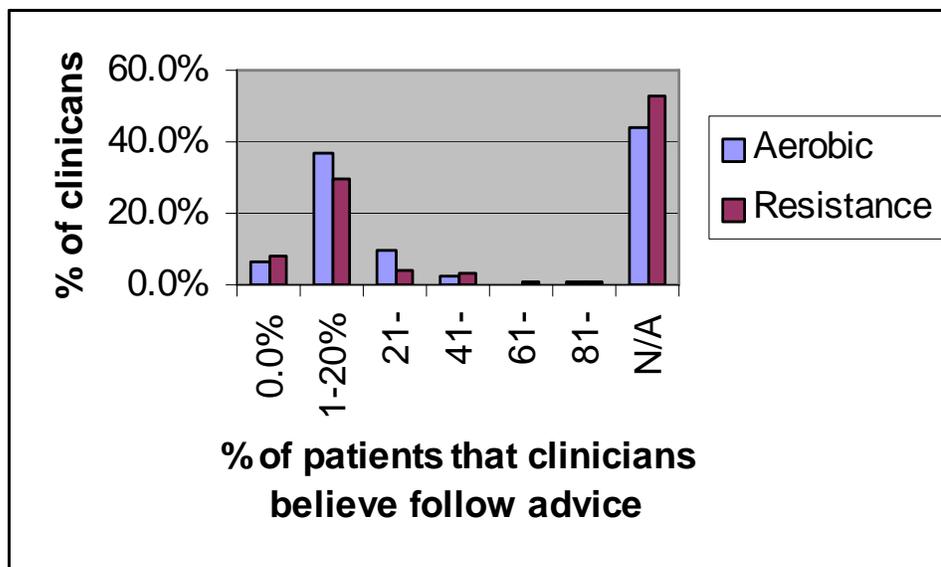


Figure 18. Percentage of patients that clinicians believe follow their exercise prescription advice

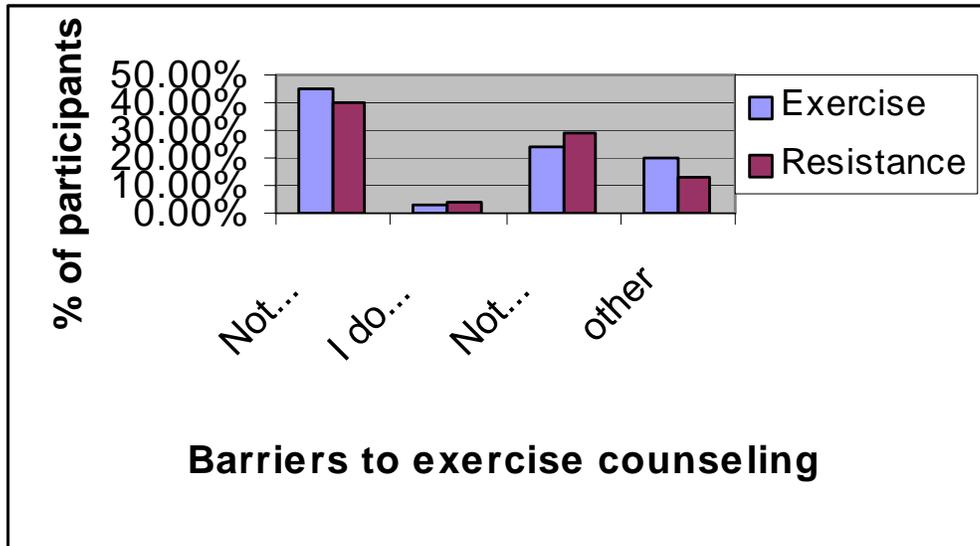


Figure 19. Major barriers to counseling patients on exercise

Appendices

Appendix A

The following survey is to assess the exercise habits among health care providers and to determine the influence of the habits on their patients. Your assistance in this academic research is greatly appreciated. By completing this questionnaire, you are giving your consent to participate in this project. Please fill in the blanks or check the appropriate box/boxes.

1. Male ____ Female ____
2. What is your age?

____ 18-24	____ 46-55
____ 25-35	____ 56-65
____ 36-45	____ 66+
3. What is your height? ____ ft ____ in.
4. What is your weight? ____ lbs.
5. What is your medical field?

____ M.D
____ D.O
____ P.A.
____ N.P.
____ O.T.
____ P.T.
____ R.N.
____ LPN
____ student
6. If you are a student, what is your field of study?

____ medical student
____ physician assistant
____ physical therapy
____ occupational therapy
____ nurse practitioner
____ nursing
7. What is your specialty?

____ Family Practice	____ Emergency Medicine
____ Internal Medicine	____ GI
____ OB/Gyn	____ Urology
____ Cardiology	____ Pediatrics
____ Rheumatology	____ other (Please specify) _____
____ Surgery	____ not applicable

Personal Exercise Habits

I. *Cardiovascular/Aerobic Fitness*

1. Do you participate in aerobic exercise on a regular bases?

____ yes	____ no
----------	---------

11. Do you recommend and suggest resistance exercises with your patients?

yes no

A. Aerobic Exercise

12. On a routine check-up, what percentage of your patients do you counsel on aerobic exercise? (If 0 percent or not applicable please skip to question 16)

0-10% 51-60% Not applicable
 11-20% 61-70%
 21-30% 71-80%
 31-40% 81-90%
 41-50% 91-100%

13. When counseling patients regarding aerobic exercise how much time do you devote to the subject?

< 1min 1-2 min 3-5 min 6-10 min >10 min

14. When counseling patients regarding aerobic exercise, what is your general recommendation?

Frequency (times per week):

1 2 3 4 5 6 7

Time (minutes per session):

0-15 16-30 31-60 46-60 > 60 min

15. What percentage of your patients do you believe follow your aerobic recommendations?

0 1-20 21-40 41-60 61-80 81-100

16. What are the barriers you perceive to counseling on aerobic exercise (please check all that apply)

Not enough time Not enough knowledge or experience
 I do not believe it offers any benefit Other (please describe) _____

B. Strength Training Exercise:

17. On a routine patient check-up, what percentage of your patients do you counsel on strength training? (If 0 percent or not applicable please skip to question 21)

0-10% 51-60% Not Applicable
 11-20% 61-70%
 21-30% 71-80%
 31-40% 81-90%
 41-50% 91-100%

18. When counseling patients regarding strength training, how much time do you devote to the subject?

< 1min 1-2 min 3-5 min 6-10 min >10 min

19. When counseling patients regarding strength training, what is your general recommendation?

Frequency (times per week):

1 2 3 4 5 6 7

Time (minutes per session):

0-15 16-30 31-60 46-60 > 60 min

20. What percentage of your patients do you believe follow your strength training recommendations?

0 1-20 21-40 41-60 61-80 81-100

21. What are the barriers you perceive to counseling on strength training (please check all that apply)

Not enough time Not enough knowledge or experience

I do not believe it offers any benefit Other (please describe) _____

Comments:

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The following survey is to assess the exercise habits of the general populations. There will be complete privacy of the information you supply because your name will never be used or associated with the project. By completing this questionnaire, you are giving your consent to participate in the project and you are certifying that you are over 18 years old.

1. Male ____ Female ____
2. What is your age?
 ____ 18-24 ____ 46-55
 ____ 25-35 ____ 56-65
 ____ 36-45 ____ 66+
3. What is your height? _____ ft _____ in.
4. What is your weight? _____ lbs
5. How many hours a week do you work?
 ____ 0-15 ____ 46-60
 ____ 16-30 ____ 61+
 ____ 31-45 ____ retired
6. What is the highest level of education you have achieved?
 ____ some high school ____ college/technology school graduate
 ____ high school graduate ____ Master's degree or higher
 ____ some college/technology school
7. What is your average yearly income?
 ____ < \$15,000 ____ \$61,000 - \$75,000
 ____ \$15,000 - \$30,000 ____ \$76,000 - \$90,000
 ____ \$31,000 - \$45,000 ____ >\$90,000
 ____ \$46,000 - 60,000
8. Do you participate in aerobic exercise on a regular basis? (Aerobic exercise is a planned activity that raises the heart and respiratory (breathing) rate.)
 ____ yes ____ no (if no then skip to question 12)
7. How often do you participate in aerobic exercise a week?
 ____ none ____ 3-4 days
 ____ 1-2 days ____ 5+ days
8. How long do your aerobic exercise sessions last?
 ____ 0-15 min ____ 46min-60 min
 ____ 16-30 min ____ >60 min
 ____ 31-45 min
9. What type of aerobic activity do you normally do? (check all that apply)
 ____ run (7-8 min/mile) ____ aerobics (step, kick-boxing, high/lo etc)

- jog (9-10 min/mile) row
 walk (12-15 min/mile) sports (basketball, football, tennis, etc)
 swim
 ride a bicycle

10. What are the barriers that you perceive to aerobic exercise? (please check all that apply)

- Not enough time I do not believe it offers any benefits
 Lack of motivation Other (please describe) _____
 Physically unable

11. Do you participate in strength training exercises on a regular basis? (Strength training includes activities such as lifting weights, sit-ups, and push-ups.)

- yes no (if no then skip to question 16)

12. How many days do you participate in strength and resistance exercises in a week?

- none 3-4 days
 1-2 days 5+ days

13. How long are your strength and resistance exercise sessions?

- 0-15 min 46min-1 hr
 16-30 min > 1 hr
 31-45 min

14. What are the barriers you perceive to strength training? (please check all that apply)

- Not enough time I do not believe it offers any benefits
 Lack of motivation Other (please describe) _____
 physically unable

15. Where do you get your information about strength training and/or exercise?

- health care provider
 magazine/newspaper
 friend/family
 television
 radio

16. Has a physician or other health care provider ever recommended exercise to you?

- yes (Please answer questions 19 and 20) no (please skip to question 21)

17. If so, what type (field) of doctor or other health care provider recommended an exercise regimen check all that apply)?

- Primary care/ family medicine Emergency Medicine
 Internal medicine Pediatrics
 OB/Gyn Surgery
 Cardiology Other

18. What type of health care provider recommended exercise to you (check all that apply)?

- Physician (M.D. or D.O)
- Physician assistant
- Nurse practitioner
- Physical therapist
- Occupational Therapist
- Nurse

21. If a health care provider provided exercise and strength training advice to you, would you follow their advice?

yes

no

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Abstract

Objective: To compare the exercise habits of health care providers to the general population and evaluate the role of health care workers' personal exercise habits on recommendation for patient exercise.

Methods: One survey was distributed to 600 health care providers at the Medical University of Ohio. Surveys queried clinicians regarding personal exercise and exercise prescription habits. The second survey was mailed to 300 randomly selected individuals from the Greater Toledo phone book. Surveys questioned the general population on demographics and exercise habits.

Results: Total survey responses from health care providers = 310 and general population = 101. 66.7% of clinicians and 53% of general population participated in exercise. 50% of the general public received exercise recommendations from health care provider while 77.4% and 61.3% of medical population recommended aerobic and resistance exercise respectively. 79.7% of medical population that exercises prescribed exercise and 68% that do not exercise prescribed exercise to patients.

Conclusion: Only half of general public had received exercise advice, although more than half of medical population recommended and counseled patients on exercise. Medical community was equally as likely to prescribe exercise despite personal exercise habits.