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A Comparative Analysis of Physical Activity and Wellness through the Adult Life Stages based upon High School Varsity Athletic Participation

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by

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Dr. Paul Wright, Dissertation Chair	October 25, 2013 Date
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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work here at Lindenwood University and that I have not submitted it for any other college or university course or degree here or elsewhere.

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Abstract

The continual decline in health and wellness and the potential impact on society, including the economic, social, physical, and emotional perspectives is a concern for health professionals. Specifically, there are concerns about the lifestyle habits as individuals' transition through the lifespan from childhood to late adulthood. The purpose of this study is to analyze the effect of high school varsity athletic participation on physical activity and wellness in the adult life stages: young, middle, and late. The researcher hypothesized that individuals that participated in high school varsity athletics would report higher levels of physical activity and higher wellness scores (social, physical, and emotional) in the adult life stages than individuals that did not participate in high school varsity athletics.

The researcher recruited, through electronic e-mail, 564 college alumni (69.1% female) to participate in the exploratory study. Participants completed the Godin Leisure-time Exercise Questionnaire and the Perceived Wellness Survey. Participants were then grouped by past high school athletic participation status (59.2% varsity athletes) and by adult life stage.

An ANOVA indicated significant differences between groups in all areas. Athletes in young adulthood showed the greatest differences in strenuous physical activity ($p<.001$) when compared to non-athletes. Athletes in late adulthood showed the greatest differences in moderate physical activity ($p<.01$) when compared to non-athletes. Non-athletes in young adulthood showed the greatest negative differences in emotional wellness ($p<.05$) when compared to all groups. Additionally, the greatest differences in total wellness was between athletes ($p<.001$) and non-athletes in young adulthood.

Finally, athletes in young adulthood reported the greatest differences in total physical activity ($p<.05$), physical wellness ($p<.05$), and social wellness ($p<.05$) when compared to other groups.

The findings from the study provide strong evidence that high school varsity participation can help individuals develop healthy habits that are carried into adulthood. The study provides a strong foundation for future research in physical activity, wellness, and sport behavior. In conclusion, school administrators and health professionals should consider providing more opportunities for more adolescents to participate in structured athletic programs to develop healthy habits that become lifelong behaviors.

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Chapter One: Introduction

Overview of the Problem

The Centers for Disease Control and Prevention (2011a) reported over one-third of adults and 17% of youth are obese in the United States. Over 72 million people meet the standard for obesity and the number of obese individuals is increasing regardless of age, sex, race, or educational level. In a similar report, Blair (2009) concluded that physical inactivity is one of the major public health problems of the 21st century due to the consequences of being inactive. In addition, according to the World Health Organization (2011) the lack of leisure-time physical activity is the fourth leading risk factor of mortality in the world. These concerns are leading many organizations and professionals in the field of health promotion to understand how to motivate society to be more physically active by conducting ongoing research and implementing interventions. Healthy People 2020 (2012) was an example of an intervention program focusing on creating science-based objectives for a ten year period through a collaborative partnerships. The objectives address a variety of health concerns in society and include concerns for physical activity and wellness (Healthy People 2020).

Physical activity is the movement of muscles during an activity (Centers for Disease Control and Prevention, 2011b; World Health Organization, 2013b). These movements can range from basic lifestyle movements to sports and other structured recreational activities. Exercise is a type of physical activity, which focuses on improving physical fitness through structured movement. According to U.S. Department of Health and Human Services (2008), purposeful exercise or physical activity consists of a program that includes 20 to 60 minutes of activity at least three to five days a week.

Using these guidelines, high school varsity athletics would be an example of purposeful exercise (p. 1).

High school varsity athletics consist of the many extracurricular activities that are available outside of school hours and sponsored by the school. High school varsity athletics allow students to compete in various sports against other students of different schools. There are three different seasons for athletics in high school: fall athletics, winter athletics, and spring athletics. During each season, there is a minimum of one sport offered for both genders and up to as many six sports available. These athletic programs provide an opportunity for students to participate in structured physical activity. High school athletes are students that participate in a sport for three years during high school. High school athletics are used for multiple purposes including developing teamwork, leadership, citizenship, and school pride. Another goal for varsity athletics is to develop healthy lifestyles with the goal of creating healthy active habits that will transition into adulthood and be sustained throughout the life span (National Federation of High School Associations, 2011a). This goal is also being emphasized in physical education and health curriculums. However, often participation in varsity athletics fulfills the physical education requirement and students may never take a physical education or health course in high school. Therefore, when students participate in varsity athletics, it becomes important that the student learns and develops the same healthy lifestyle habits he or she would learn and develop in traditional physical education and health curriculum.

Participation in varsity athletic programs promotes discipline for positive habit formation. When habits are formed, the individual has established a routine of

performing a task or tradition on a regular basis. Habits can be either subconscious or conscious actions. It is the ability to continue to do the same thing over and over. Forming healthy active habits would mean an individual participates in physical activity several times a week.

Those who participate in high school varsity athletics create a routine of playing a sport which gives them the opportunity to develop healthy physical activity habits that can be carried into adulthood. Those who do not have the opportunity to participate in high school athletics are left to themselves to develop healthy habits on their own. Extracurricular activities outside of high school are few especially in rural areas for the adolescent age group. This indicates it is difficult for those not participating in high school athletics to develop healthy active habits. In addition, intramural sports are only available in 45% of secondary schools in the Unites States (Fuller, Sabiston, Karp, Barnett, & O'Loughlin, 2011). The limitation of structured athletics in highs school is a concern for those interested in healthy lifestyles throughout the life span. Athletics are a great source of physical activity and more opportunities are needed in and outside of high school that allow all students to participate in structured athletics and produce physical activity.

As a student graduates from high school, there are several life paths an individual can follow. Some high school graduates will attend college. Some will begin their careers, and others will begin families or pursue other interests. A common lifestyle change is the absence of structured physical activity opportunities. In college, very few students that participated in high school athletics get the chance to participate in athletics sponsored on the collegiate level. According to the National Collegiate Athletic

Association (2012), the percentage of high school athletes that advance to play the traditional sports at the collegiate level is 3.3% for men's basketball, 3.7% for women's basketball, 6.4% for football, and 6.7% for baseball respectively (p. 1). College students are then responsible for seeking out other opportunities for structured physical activity. Although many higher education institutions provide campus recreation programs open to all students, many young adults are not achieving the recommended physical activity per day (Reed, 2007). This in turn leads to a sedentary lifestyle pattern not only in college but throughout adulthood (Irwin, 2007). Instead of developing healthy habits, or continuing in the routine of healthy habits that were established in adolescences, college students are developing unhealthy habits by not being physically active. High school graduates that do not attend college must rely on community recreation programs to fill the void of structured physical activity. The active or non-active habits that are formed during adolescence may be carried over into adulthood and maintained throughout the lifespan.

Purpose of the Study

The purpose of this study is to determine if participation in high school varsity athletics has a positive effect on physical activity and wellness later in life. The ability to form healthy habits while in high school may be vital in helping individuals maintain physical activity levels which would help fight the obesity epidemic in both adolescence and adulthood. It was reported that 70% of youth drop out of youth sports before their 13th birthday (Engh, 2002). Because there are a variety of factors that contribute to this drop-out according to Cary (2004), this study will analyze youth that continue to participate in sports through high school athletics as the focus is on the long-term effects

of sport participation in regards to physical activity and wellness later in life. The study will analyze the physical activity levels of individuals in the three adult stages of the lifespan: young adulthood, middle adulthood, and late adulthood. The study will also compare the physical activity levels of individuals that did participate in high school athletics with those individuals that did not participate in high school athletics. The comparison will help indicate if participation in high school athletics is a positive indicator of sustained physical activity later in life. In addition, the study will analyze the self-reported physical, emotional, and social wellness of both athletes and non-athletes later in life to determine if there is a relationship between high school varsity athletic participation and wellness later in life.

Rationale

Physical inactivity is a major risk factor for many health related diseases. Coronary heart diseases is often cited as the main disease but other diseases have an increased risk when associated with physical inactivity including adult-onset diabetes, obesity, hypertension, colon cancer, osteoporosis, anxiety, and depression (Blair, Cheng, & Holder, 2001; Pate et al., 1995). Developing healthy physical activity habits may be vital in preventing the cause of so many diseases.

Many adult behaviors are established during high school (Buckworth & Nigg, 2004). Therefore the establishment of healthy habits of physical activity during adolescence in high school may help individuals have a healthy lifestyle and be able to maintain physical activity into college and throughout adulthood (Irwin, 2007). The International Platform on Sport and Development (IPSD) (2011) indicated that sport participants may have a greater ability to form life-long habits of physical activity than

those that do not participate in sports. The IPSD (2011) suggests that competitive athletics may encourage life-long participation and may support the need for accessible athletic programs beyond educational institutions that provide a holistic perspective.

It is recommended that adolescents accumulate 30 to 60 minutes of moderate physical activity daily (Epstein et al., 2006). This physical activity can be accomplished through many different ways, unfortunately unhealthy food, oversized meal portions, decreases in high school athletic participation, and unavailability of structured programs promoting healthy habits, all contribute to minimum physical activity standards not being met. When adolescents are unable to establish physical activity habits that are carried into adulthood, the individuals increases their chances of being diagnosed with risk factors of physical inactivity and living a sedentary lifestyle (Barnekow-Bergkvist, Hedberg, Janlert, & Jansson, 1998).

Telama, Leskinen, and Yang (1996) and Barnekow-Bergkvist et al. (1998) both studied physical activity in longitudinal studies from adolescence to early adulthood and both indicated further research studies on physical activity throughout the lifespan is needed. In addition, Barnekow-Bergkvist et al. (1998) indicated accessibility to sports at a younger age are important factors to consider for facilitating positive physical activity experiences that may help develop physical activity habits later in life. Jiang et al. (2007) experimented with an intervention program that showed a significant decrease in the prevalence of obesity later in life and suggests structured programs may be able to reduce health problems that are extended into adulthood. Furthermore, Beck, Gillison, and Standage (2010) found that active retirees contributed their physical activity levels to life-long tendencies, which further supports the need for research on programs, such as sports,

that may establish physical activity tendencies. Understanding if high school athletics develops healthy habits may benefit health professionals in providing intervention and prevention programs for the development of healthy habits to fight obesity and the many other related risks of physical inactivity.

Based on an extensive review of literature, there is a need for a study to compare the physical activity habits and wellness of individuals that did and did not participate in high school athletics to determine if there is a connection between high school athletics and physical activity levels and wellness later in life. Most research on the topic of sustained physical activity only reports on a baseline level and end level. Understanding physical activity during multiple life stages may offer a stronger support for needed recommendations. When individuals are unable to establish healthy physical activity habits in high school, it makes it harder to develop them in adulthood. The more that is known about physical activity habits, the more policy makers and health professionals might be able to do to increase physical activity for adolescents and adults.

Understanding how to form healthy habits may benefit recreation, sport, and health professionals in designing programs for the development of healthy habits designed to reduce sedentary lifestyles and fight obesity. Understanding the relationship between athletic participation and non-athletic participation in regards to establishing physical activity habits, may provide a foundation to support intervention and prevention programs to develop healthy habits. This study could be used as a model for school districts and health professionals that want to help establish healthy physical activity habits that are sustained throughout the life span.

Research Questions and Hypotheses

The study was focused on the four research questions below:

1. Does high school athletic participation develop physical activity habits that are sustained throughout the three adult life stages: young, middle, and late?
2. Do individuals that participated in high school athletics have a higher level of physical activity in the three adult life stages when compared to those that did not participate in high school athletics?
3. What are the differences between the physical activity levels by adult life stage?
4. Do individuals that participated in high school athletics have a higher self-reported wellness scores than those that did not participate in high school athletics?

The study had six hypotheses listed below:

1. High school varsity athletic participants report higher rates of moderate-strenuous physical activity through the adult life stages when compared to non-participants.
2. High school varsity athletic participants report higher levels of total physical activity than non-participants.
3. High school varsity athletic participants report higher physical wellness scores through the adult life stages when compared to non-participants.
4. High school varsity athletic participants report higher emotional wellness scores through the adult life stages when compared to non-participants.

5. High school varsity athletic participants report higher social wellness scores through the adult life stages when compared to non-participants.
6. High school varsity athletic participants report higher total wellness scores through the adult life stages when compared to non-participants.

Variables

The independent variable for this study was participation and non-participation in high school varsity athletics. The dependent variables were the physical activity levels of individuals and perceived physical, emotional, and social wellness in the three adult life stages of the life span.

Assumptions

1. The test instruments were valid and reliable measures of physical activity habits and perceived wellness.
2. The participants completed the survey with complete honesty.
3. The participants completed the survey accurately.
4. The participants were representative individuals that graduated from a university in the Midwest area of the United States.

Definition of Terms

1. Physical activity: Physical activity is defined as any muscle movement that results in energy expenditure (Centers for Disease Control and Prevention, 2011b; World Health Organization, 2013b).
2. Healthy habits: Healthy habits is any moderate to strenuous physical activity involving individual to be engaged in continual activity for at least 30 minutes three to five times a week (Epstein et al., 2006; Pate et al., 1995).

3. Moderate physical activity: Moderate physical activity requires moderate amount of effort that accelerates the heart rate 3.0 to 5.9 times the normal heart rate (Centers for Disease Control and Prevention, 2011b, p. 1; World Health Organization, 2013c, p. 1).
4. Strenuous physical activity: Strenuous physical activity requires a large amount of effort to raise the heart rate 6.0 or more times the normal heart rate (Centers for Disease Control and Prevention, 2011b, p. 1; World Health Organization, 2013c, p. 1).
5. High school varsity athletics: High school varsity athletics are programs sponsored by an institution, which requires a high level of skill resulting in individuals being restricted from participation due to lack of skills (Williams, 2008). High school varsity athletics only include athletic programs associated with the National Federation of State High School Associations (2011b).
6. High school varsity athlete: For the purpose of this study, the author defines a high school varsity athlete as an individual that participates in high school athletics for two or more years during high school.
7. Young adulthood: Young adulthood includes any individual between the ages of 18 and 34 (Allen, 2005; Barnett & Blanco, 2013).
8. Middle adulthood: Middle adulthood includes any individual in between the ages of 35 and 54 (Allen, 2005; Barnett & Blanco, 2013).
9. Late adulthood: Late adulthood includes any individual 55 years old or older (Allen, 2005; Barnett & Blanco, 2013).

10. Physical wellness: Physical wellness refers to the behaviors that keep the body healthy including physical fitness, proper nutrition, and refraining from substance abuse (Powers & Dodd, 2008).
11. Social wellness: Social wellness refers to the level of social support and meaningful interpersonal relationship an individual develops and maintains (Powers & Dodd, 2008).
12. Emotional wellness: Emotional wellness refers to mental health and includes areas of social skills, interpersonal relationships, ability to cope with stress, and levels of self-esteem (Powers & Dodd, 2008).

Conclusion

Understanding how healthy habits are formed may benefit health professionals in providing programs for the development of healthy habits to fight obesity. By understanding the relationship between participation in athletic programs, health and leisure professionals would have a foundation from which to make important program policy decisions designed to develop healthy habits. This study could be used as a model for future health and leisure professionals that want to help establish healthy physical activity habits in adolescence that can be carried into adulthood. The ultimate good that would come from the study would be insight into healthy physical activity habits and perceived wellness through the respective life stages.

Chapter Two: The Literature Review

The review of literature will explore the current and past research on physical activity throughout the lifespan with an emphasis on the role athletic participation has in promoting healthy lifestyles. An analysis of the research will include literature from the fields of sport, recreation, wellness, and physical activity. The foundation and rationale for the purpose of the study will come from the literature review.

Physical Activity and Wellness

Physical activity and wellness are important elements of a healthy lifestyle. Wellness extends beyond physical fitness and includes areas that address six dimensions for overall human health. Total wellness includes physical, social, emotional, psychological, intellectual, and environmental wellness (Powers & Dodd, 2008). Wellness can be achieved through participation in various activities focused on one or more of the wellness dimensions (Powers & Dodd, 2008). Athletics may easily be associated with physical wellness through active participation in a sport contest. However, athletics may also be associated with other areas of wellness including social and emotional. The ability to work together in a team setting may help individuals develop social skills that may improve social relationships. In addition, learning how to lose in athletic contests and the ability to try again may be associated with strong emotional wellness.

Physical activity is the process of muscle movement that increases the amount of energy used in an activity (Centers for Disease Control and Prevention, 2011b). A broad term of physical activity would be any movement of the muscles. Two types of physical activity need to be addressed in this paper: moderate and strenuous. Moderate physical

activity uses large muscle groups and at a little higher than normal heart rate (World Health Organization, 2013c). Examples of moderate physical activity would include walking, dancing, gardening, and various household and work related activities. Strenuous physical activity also uses the large muscle groups but with a rhythmic and repetitive movement with the heart rate at seventy percent or higher than normal (World Health Organization, 2013c). Examples of vigorous physical activities may include running, cycling, jumping rope, skating, cross-country skiing, and competitive team sports such as soccer or basketball. Moderate to strenuous physical activity also involves the individual to be engaged in continual activity for at least 30 minutes (Epstein et al., 2006; Pate et al., 1995; World Health Organization, 2013c).

Why Physical Activity is Important?

The health benefits of physical activity provide many reasons why it is important to be physically active and to develop habits of physical activity (Buckworth & Nigg, 2004). Nonetheless, physical activity levels continue to decline during adolescence (Sallis, 1993; Stone, McKenzie, Welk, & Booth, 1998). The impact of inactivity results in the majority of the adult population as being sedentary (Booth & Chakravarthy, 2002). Regular activity in adolescence is crucial in developing physical activity habits that may affect health throughout life. Recent research indicates that nearly 25% of the country's youth are responsible for their own free time (Illinois Association of Park Districts, 2006). When youth are unsupervised and not participating in athletics or other structured activities, they tend to be less active. The number of overweight children in the United States has continually increased in the past two decades (Healthy People 2020, 2013; Ogden, Flegal, Carroll, & Johnson, 2002; Sallis, 1993; Stone et al., 1998). In addition,

according to the Centers for Disease Control and Prevention (n.d.), one in six children are now obese and approximately one in three adults are obese. Based on the current trends, as individuals become older the ability to maintain physical activity and an appropriate body weight becomes more difficult. The ability to participate in more physical activity before adulthood may be a key to helping individuals as they transition through the lifespan to maintain physical activity and appropriate body weight that may lead to a healthier lifestyle by reducing possible health problems. Paffenbarger, Hyde, Wing, and Hsieh (1986) surveyed over 16,000 college alumni and found a decrease of mortality of up to 46% of individuals that maintained regular physical activity throughout the lifespan into the 70 and 80 age brackets. This was one of the landmark studies that supported the need to be physically active starting as early as possible in order to live a full and healthy life late into adulthood.

Perceived wellness may also be improved through maintaining physical activity and body weight throughout the lifespan. There is limited research on the impact of physical activity on quality of life and well-being. In a comprehensive review of the literature on the topic, Rejeski, Brawley, and Shumaker (1996) found that physical activity positively affects quality of life. There are a number of measures that have been used to determine health-related quality of life including emotional well-being, perceptions of well-being, happiness, self-concept, and life satisfaction all of which are affected by physical activity (Caspersen, Powell, & Merritt, 1994; McAuley, 1994). However, Bezner, Adams, and Whistler's (1999) study on the connection between wellness and physical activity is one of the few studies that utilize a comprehensive wellness instrument. Bezner et al. (1999) utilized a convenience sample of hospital

employees that represented all of the shifts at the 7-day a week 24-hour hospital and was mainly comprised of Caucasian employees with a college degree. The participants were 80% female and the ages ranged from 24-72 years. Two hundred and forty-three employees were recruited for the study. The Perceived Wellness Survey (PWS) was used to assess the employee's wellness perceptions in the six areas of wellness which include physical, social, emotional, intellectual, psychological, and spiritual. Perceived wellness was scored on a 6-point Likert scale ranging from "very strongly agree" to "very strongly disagree." The higher the scores the greater wellness an individual perceived. The Paffenbarger Physical Activity Index (PAIQ) was also used to gauge the participants' physical activity. The PAIQ was originally used to investigate the connection between physical activity and heart disease. The 3-item survey provides questions about the activities performed in the previous week which included the number of stairs climbed each day, the hours of participation in sports each week, and the number of blocks walked each day. Bezner et al. used the composite score of the PAIQ. Finally, Bezner et al. (1999) used the Baecke Questionnaire (BQ) which assessed habitual physical activity by using a 5-point Likert scale ranging from "never" to "always." The three factors used in the BQ instrument were leisure-time activity excluding sport, physical activity at work, and participation in sports. Again a composite score was used for the purpose of the study conducted by Bezner et al. (1999). The survey instruments were given to participants 7-14 days prior to the data collection date. Subjects were grouped into three categories based on the composite scores of the three surveys. The lowest 25% of scores were assigned to the sedentary group, the middle 60% were assigned to the moderate active group, and the top 15% were assigned to the high active group. Using the PWS

composite score as the dependent variable, Bezner et al. (1999) reported participants in the high active group had a significantly higher wellness score when compared to the sedentary group when using the BQ and PAIQ results. Furthermore, participants grouped in the high active and moderate active groups had significantly higher physical and psychological wellness when using the BQ scores. This study provides evidence that there is a relationship between physical activity and overall wellness. Furthermore, the study provides valuable information about the importance of habitual physical activity and supports the recommendations by health organizations to become involved in regularly planned physical activity during leisure. The idea that high school athletics is a planned activity during leisure, and physical in nature, gains further support for more youth to be involved in athletic activities and that more opportunities are made available for not only physical health but overall wellness.

Health Risks of Physical Inactivity

Physical inactivity is one of the major risk factors for coronary disease as well as being linked to increased risk for hypertension, osteoporosis, adult-onset diabetes, anxiety, obesity, depression, and colon cancer (Astrup, 2001; Booth, Gordon, Carlson, & Hamilton, 2000; Illinois Association of Park Districts, 2006; Pate et al., 1995). Developing healthy habits is vital in preventing the cause of many diseases. Physical activity decreases with age and research indicates the greatest increase occurs during late adolescence and in early parts of young adulthood (Buckworth & Nigg, 2004; Stevens, Jacobs, & White, 1985). It is recommended that adolescents accumulate 30 to 60 minutes each day of moderate to strenuous physical activity (Epstein et al., 2006; Pate et al., 1995). When adolescents are unable to establish physical activity habits that are

carried over into adulthood, the individuals increase their chances of being diagnosed with the above for mentioned risk factors of physical inactivity (Barnekow-Bergkvist et al., 1998).

Obesity has become one of the major focus areas for health professionals in implementing new programs to improve society's health (Healthy People 2020, 2013). The obesity epidemic has become a global health concern as the disease continues to spread. The World Health Organization (2013a) reported an estimated 1.6 billion people are considered overweight or obese. These staggering statistics placed a focus on understanding the problem at the forefront of many governmental agencies, health professionals, and researchers.

Research has shown that there are a variety of factors that have contributed to the obesity epidemic. Finkelstein, Rhum, and Kosa (2005) identified three main culprits including a decrease in energy expenditure through physical inactivity, an increase in energy intake, and an increase in the consumption of processed foods that are nutrient deficient. Although related, each of these areas has warranted separate research to better understand the problem in order to make logical decisions in prevention and treatment methods.

Causes of Obesity

One of the areas investigated for causing the obesity epidemic was the shift from a manual labor society to an industrial society. In the 1800s and even in the early 1900s, the United States was primarily an agricultural society where a high percentage of society worked in farming. The business of agriculture required hard manual labor which helped Americans maintain the physical activity necessary to maintain a healthy lifestyle. As

America transitioned into an industrial society, manual labor jobs were replaced by machines that reduced many of the labor-intense careers. Individuals were now responsible for operating the machines that performed the bulk of the labor once performed by employees. Lakdawalla and Philipson (2002) investigated this idea by researching the relationship between reduced manual labor and technological advancements in the workplace. The research showed a dramatic decrease in energy expenditure but the decrease could not be blamed for the rise of the obesity epidemic (Lakdawalla & Philipson, 2002). The shift from a manually labor intense society began in the early 1900s while the rising obesity rates have only just become evident in the past few decades. It is possible that the increase in body weight was slowly occurring during the type of work transition in America and is now only evident because the Baby Boomer generation were only youth at the time of the transition and are now the adults suffering from obesity. However, this is circumstantial as researchers have just begun to investigate the cause and effect of the obesity epidemic. In addition, there has been a significant increase in obesity rates in children and adolescents, who were not part of the transition from manual labor to technology labor in the workplace.

The reduction in manual labor in the workplace may, however, be related to the overall decrease in energy expenditure when considering leisure time physical activity. Before the changes in the workplace, most Americans were able to maintain physical activity levels through work and it may be assumed that little physical activity outside of the workplace was pursued because of the labor intensity of work. Once technology was introduced and the energy expenditure at work was reduced, there may not have been an increase in leisure time physical activity. Although through this perspective, technology

in the workplace can be a contributor to the obesity epidemic, researchers agree the focus should be on the trends of energy expenditure outside the workplace. Many adults are not meeting the recommended 30 minutes of moderate to strenuous physical activity five or more days a week. The trend of reduced physical activity has been a concern for the past couple of decades as it is reported that less than one-third of adults have engaged in the recommended amount of physical activity, and as many as 40% are not involved in any physical activity during their leisure time (United States Department of Health and Human Services, 2001). The reasons behind the decrease in leisure time physical activity and how it relates to the obesity epidemic has become a focus for researchers in the past few years.

Cawly, Meyerhoefer, and Newhouse (2006) contribute the obesity epidemic to western cultures encouragement of excessive eating and physical activity being discouraged. The Centers for Disease Control and Preventions (2004) also place part of the cause of the obesity epidemic to the influence of western culture. Western culture has advanced at a rapid pace in technology that has altered the food industry making food less nutritious and more accessible. As individuals consume more high-calorie and less nutritious foods, individual energy levels decrease and as a result physical activity also decreases (American Obesity Association, 2008). The Centers for Disease Control and Prevention (2012a) also linked obesity to emotional, social, and psychological difficulties. These difficulties included having a higher risk of depressive disorders, lower self-esteem, and distorted body image all of which lead to an even higher consumption of food. These concerns may contribute to a lack of motivation for individuals to become active participants in society. Increased weight gain and obesity

and has also been linked to the development of type 2 diabetes (Mokdad et al., 2001). According to Mokdad et al. (2001) type 2 diabetes is the sixth leading cause of death in the United States and diabetes continues to increase and impacts almost 16.7 million Americans.

The increase of caloric intake has become one of the major contributors to weight gain in the past few decades with as much as a 15% increase since the 1980s. Research has shown that from the early 1900s to the mid-1980s, caloric remained fairly consistent but between 1985 and 2000 caloric intake increase by 12% (Putnam, Allshouse, & Kantor, 2002). Putnam et al. (2002) suggest the increase is due mainly to increased consumption of foods high in fats and sugars. The Centers for Disease Control and Prevention (2004) also tracked caloric intake and indicated caloric consumption remained stable from 1970 to 1980 but then increased dramatically in the next 20 years with women increasing consumption by 23% and men increasing consumption by 7%. Cutler, Glaeser, and Shapiro (2003) indicated that snacking is another trend in regard to caloric intake that has increased weight gain in the past few decades. According to the research, high snack intake was fully responsible for the dramatic increase in caloric intake by women and accounted for 90% of the increased caloric intake for men between the 1970s and 1990s. In addition to snacking, Putnam et al. (2002) found that the average American consumed over 50 gallons of soda and over 17 gallons of other high calorie drinks including fruit juices. The dramatic increase in calorie consumption can be directly tied to the obesity epidemic but cannot be the only factor.

It is also important to understand the changes that have occurred and continue to occur in the home. One of the biggest changes was the introduction of the television.

Television has gained attention as a possible explanation of the obesity epidemic in adults and children because it may encourage a sedentary lifestyle. The amount of time people watch television has seen a significant increase with the advancements in technology and a flourishing economy, in the early 2000s, which has allowed more households to have multiple televisions in the home. The Nielsen Company (2007) reports that over 111.4 million homes in the United States has a television and the average time the television is on in the home is 8 hours and 15 minutes. The Nielson Company (2007) also reports that the average time individuals watch television is 4 hours and 34 minutes per day. At this rate, the amount of television someone will watch in their lifetime would be approximately nine full years (Kubey & Csikszentmihalyi, 2004). Furthermore, Robinson and Godbey (1997) suggest that almost all of the free time Americans have gained in recent years due to technologic advancements, in and out of the workplace has been given over to television. Kubey and Csikszentmihalyi (1990) investigated the effects of television on overall experience by documenting people's feelings while engaged in television, public leisure activities, and working outside the home. The research showed that television viewing was passive, relaxing, and involved low concentration. Television was also found to be less challenging, less social, and less active when compared to the other variables studied. There has also been a link between television viewing and increased unhealthy snacking. In addition, the snacking that occurs during television viewing indicates an increase in portion sizes and a higher percentage of caloric consumption from fat (French, Story, & Jeffery, 2001). The research on television viewing is not only related to the reduction of physical activity but can also be linked to a decrease in wellness specifically from a social and emotional

standpoint. However, some research has suggested that television cannot be the sole culprit for an increased sedentary society. Finkelstein et al. (2005) elaborated on the topic by indicating television viewing increased dramatically during the late 1960s when color television became affordable. While the research may not be conclusive on the role television plays in the obesity epidemic, it can be assumed that television and technological advancements are one factor in reducing physical activity in the past few decades in society.

The body mass index (BMI) is the most frequently used measure globally to determine healthy and unhealthy body mass. The equation used for BMI indicates an individual's body fat based on a height to weight ratio. BMI is determined by a calculation of an individual's weight in kilograms divided by the height of the individual in meters squared. There are four weight classifications for the BMI: underweight (BMI < 18.5), normal weight (BMI 18.5 - 24.9), overweight (BMI 25 - 29.9), and obese (BMI > 30.0) (World Health Organization, 2013a). In addition, there are three classifications in obesity including Obesity I (BMI > 30.0 - 34.9), Obesity II (BMI 35.0 - 39.9), and Obesity III (BMI > 40.0) otherwise known as extreme obesity (World Health Organization, 2013a). These classifications are used by many health organizations to indicate an individual's potential risks for health-related diseases.

According to the National Institute of Health (2012), there has been a significant increase in overweight and obese adults in the United States. In 1962, overweight adults amounted to 32% of the adult population with an additional 13% of adults being considered obese, and an additional 1% being considered extremely obese (National Institute of Health, 2012). These results meant that 46% of adults were at risk for health

related diseases. The growth of overweight and obese adults was increasing gradually until the 1970s when there was a dramatic increase up to the year 2000. In the early 2000s, it was estimated that nearly 70% of adults were either overweight or obese (Hedley et al., 2004; National Institute of Health, 2012). Of that percentage, there was a slight increase to 34% of overweight individuals, a dramatic increase to 31% of obese individuals which is almost double the percentage in 1962, and an increase to 5% of extreme obesity. By 2010, 75% of individuals were overweight or obese with slight increases in each category (National Institute of Health, 2012). As excess body weight increases, the risk of morbidity from type 2 diabetes, hypertension, stroke, coronary heart disease, and many cancers also rises. There are an estimated 300,000 deaths attributed to obesity related causes each year (Fengal, Graubard, Williamson, & Gail, 2005; National Institute of Health, 2012). In the United States, obesity and excess body weight rank as the second leading cause of preventable death (National Institute of Health, 2012). In addition, cardiovascular disease is currently the leading cause of death among both genders in the United States (Centers for Disease Control and Prevention, 2011a; National Institute of Health, 2012; World Health Organization, 2013c).

These unhealthy concerns are not only affecting adults but children are being affected as well. According to the American Obesity Association (2008), there has been a significant increase in overweight children and teenagers since 1980 with almost doubled and tripled numbers of overweight children and teenagers respectively. In addition, over 15% of youth in the United States are obese. Youth obesity has been linked to sleep apnea, which is a brief disruption in sleep and has been linked to depression and memory difficulties (Barlow & Dietz, 2002). Youth are also now being

affected by traditional adult type diseases including high blood pressure, type 2 diabetes, high cholesterol, and bone and joint problems which are all caused by being overweight (American Diabetes Association, n.d.). Obese youth are also nine times more likely to have persistent hypertension when compared to normal weight youth. One of the strongest indicators of high blood pressure in adulthood is high blood pressure in youth which also increases the risk of cardiovascular disease dramatically (Dietz, 1999).

In addition to the negative physical ailments of being overweight and obese in childhood, there are other areas of wellness that need to be explored. Overweight and obese children seem to be less emotionally stable and suffer from more behavioral problems when compared to their normal weight peers. Zametkin, Zoon, Klein, and Munson (2004) found that obese children reported being more lonely, sad, and suffer from more anxiety than their normal weight peers. In addition, Strauss (1999) studied the relationship between childhood obesity and self-esteem and found that young children reported lower self-esteem and more negative perceptions of their physical appearance than their normal weight peers. Individuals with excess body weight may also suffer from social stigmatization and discrimination (Puhl & Brownell, 2001). This stigma refers to the negative attitudes that affect the interpersonal relationships for overweight and obese individuals. In turn, this stigma may have a significant negative effect on perceived social and emotional wellness and overall quality of life. Overweight and obese children who have been targets of overweight stigma internalize negative feelings and begin to blame themselves for negative experiences they encounter in social settings, especially adolescent females (Neumark-Sztainer, Story, & Faibisch, 1998). Dietz (1999) examined the social perceptions of being overweight in educational settings. Children 10

and younger that were overweight and obese were often perceived by their classmates as less desirable. Overweight and obese middle school children were perceived to be more sloppy and lazy by their normal weight peers.

These types of experiences are associated with adolescents developing low self-esteem and depression, and being socially isolated (Miller & Downey, 1999; Neumark-Sztainer, et al., 1998; Pierce & Wardle, 1997). In addition, Miller and Downey (1999) discovered that physical wellness related to an individual's perceived body weight had a stronger correlation with low self-esteem than an individual's actual body weight. The negative effects of perceived emotional, social, and physical wellness in adolescents may extend beyond high school and can be detrimental in adulthood. Puhl and Brownell (2001) discovered bias and discrimination in employment, during the interview process, in education, and in health care when an individual was overweight or obese. The early stigmatization of overweight and obese children may explain children's lower perceived wellness overall as they transition through the lifespan (Latner & Stunkard, 2003).

The occurrence of childhood obesity can be contributed to a variety of behavioral factors that may be modifiable including physical inactivity, sedentary behaviors, eating habits, and the environment. The American Obesity Association (2008) reported that children who have overweight and obese parents are 70% more likely to be overweight or obese in childhood, which could continue into adulthood. Parents play a significant role in the factors that have been linked to lower quality of life and physical inactivity. Parents often set the tone for the amount of physical activity through structured and unstructured play situations a child will participate in as well as provides the majority of available dietary sources for consumption. The overall environment provided by the

parents can be a strong indicator of physical activity and overall wellness in children and adolescents and even in the transition for adolescents to adulthood. Combined with the school and social environments, the family environment may play the biggest role in predicting overall physical activity and weight gain in childhood (Hebebrand, Sommerlad, Geller, Gorg, & Hinney, 2001). Genetics may also play a role in predicting obesity but many researchers agree that the various environments are more reliable factors in predicting overall health (Hebebrand et al., 2001).

The transition from childhood to adulthood has received some attention with regard to the patterns identified in childhood that are present in adulthood. Barlow and Dietz (2002) concluded their study on the management of obesity in childhood by stating children that live a lifestyle of physical inactivity and poor eating habits are more likely to continue those behaviors into adulthood and throughout the lifespan. With the addition of smoking and alcohol use in childhood, physical inactivity and poor eating habits are the same factors that predispose adults to increased risks of stroke, pulmonary disease, type 2 diabetes, cancer, and coronary heart disease which can all lead to a premature death (Pyle et al., 2006). To demonstrate the transition from adolescence to adulthood, the U.S. Department of Health and Human Services (2001) estimated that half of youth and young adults, ages 12-21 are physically inactive, with physical activity decreasing with age. The concern over physical wellness can also be directly related to other areas of wellness including social and emotional wellness. The overall health status of individuals throughout the lifespan has raised many concerns about the current programs promoting wellness and physical activity in childhood that can be carried over into adulthood.

Economic Impact of Physical Inactivity

The financial impact of the risk factors associated with physical inactivity need to be explored in order to better understand the full scope of the problem. According to Mokdad et al. (2001), obesity and diseases related to obesity have increased health care costs dramatically and has had a negative effect on the economy. The economic consequences of physical inactivity and excess body weight have both direct and indirect impacts and costs on society. Health care costs include treatment programs focused on treating diseases caused by obesity as well programs focused on reducing body weight for those with excess body mass. In addition, preventative and diagnostic services are used to treat and prevent obesity and diseases related to physical inactivity. Direct costs include hospitalization, physician visits, rehabilitation programs, and even nursing home care. Multiple studies have investigated the economic impact of physical inactivity and all have found similar results. One study found that businesses with employer-provided health insurance reported that 5% of health insurance expenditures were caused by obesity (Thompson, Edelsberg, Kinsey, & Oster, 1998). Wolf and Colditz (1998) found similar results, reporting annual medical expenditure caused by obesity ranged between 5.5% and 7.0% in the United States. Many of these costs are passed onto healthy and non-healthy tax payers because governmental agencies, such as Medicaid, cover many of the obese individuals in the United States (Finkelstein et al., 2005). Furthermore according to Finkelstein et al. (2005) over 50% of individuals covered by Medicaid are obese. This means that the government is funding a majority of programs focused on treating medical costs associated with obesity or reducing the obesity epidemic (Finkelstein et al., 2005). Finkelstein, Fiebelkorn, and Wang (2003) reported that the

average American taxpayer spent close to $175 per year for individuals that were obese and were on Medicare and Medicaid programs. The report also demonstrated that the costs of obesity in 1998 were about $78.5 billion. In addition, Thorpe, Florence, Howard, and Joski (2004) found that inflation-adjusted medical spending rose 27% between 1987 and 2001 due to obesity. Roehrig, Miller, Lake, and Bryant (2009) found that $190 billion were spent on medical costs for diabetes annually. Although obesity is not the only factor for diabetes, excess body weight is the number one predictor of developing diabetes. One may conclude that these medical costs would be significantly lower if obesity was not a problem in society.

In a more recent report of medical costs attributed to obesity, Finkelstein, Trogdon, Cohen, and Dietz (2009) estimated that the annual cost of obesity would rise to 10% of all medical spending with the final cost being around $147 billion per year by 2008. This study utilized the Medical Expenditure Panel Survey from 1998 to 2006. The survey represents a national sample population of 18 year olds and older and quantifies medical costs by the service rendered and how payment was received, either from Medicare, Medicaid, private, or other sources. The report utilized basic demographics including height and weight which determined body mass index. A four-question regression was used to indicate total medical costs separate from those that did and did not need an inpatient visit. Two-part models were also used to quantify the different types of service rendered. The authors found that in 2006, obese individuals paid roughly $1,429 more than normal-weight individuals (Finkelstein et al., 2009). This is an increase of 5% from 37 to 42% when comparing 1998 data with 2006 data. According to the data, per capita annual costs because of obesity for Medicare, Medicaid and private

payers were 36%, 47%, and 58% respectively (Finkelstein et al., 2009). Medicare non-inpatient services and prescription drug coverage were the major factors that increased medical spending. It was estimated that spending in these categories was $600 per year higher for obese individuals when compared to normal weight individuals. Only prescription drugs showed a significant increase, 61% increase, in annual spending for Medicaid when comparing 1998 and 2006. Private payers indicated significant increases in both prescription drugs, a $284 increase, and inpatient services, a $443 increase. Together the spending increases are 82% of the overall 90% increase in medical spending when compared to normal weight individuals. Finkelstein et al. (2009) concluded that the $40 billion in increased medical costs from 1998 to 2006, which includes $7 billion in prescription drugs, were caused by obesity. Furthermore, if obesity would have remained at 1998 levels, spending for obesity related medical costs may have been around $47 billion instead of $86 billion in 2006. This study further indicates the need for more physical activity programs.

The economic impact of physical inactivity and poor wellness is further highlighted when investigating the earnings lost due to illness, disability, and earlier death that are related to excess body weight and obesity. This economic impact is often overlooked because it is an indirect cost to businesses and society as a whole. The U.S. Surgeon General (1999) reported that the estimated annual national indirect cost of obesity was $64 billion with a total cost as high as $139 billion per year when direct and indirect costs were combined. When the costs of obesity with the relationship to indirect costs are analyzed, the major costs are associated with hypertension, type 2 diabetes, and coronary heart disease (United States Department of Health and Human Services, 2001).

An even further break down of costs with each state show the healthiest states have the lowest cost of annual medical costs for the treatment and prevention of obesity whereas other states have much higher costs (Centers for Disease Control and Prevention, 2012a). Although there are differences in how much each state spends on medical costs associated with excess body weight, all states have increased spending for treatment and prevention of obesity as this epidemic continues to spread and increase.

According to Zametkin et al. (2004), the national costs associated with obese children have also risen in the past 10 years. Although there are no published reports for the total costs of childhood obesity, hospital costs for childhood obesity are kept. According to those reports, obesity in childhood has nearly tripled in the past 20 years. In the late 1970s and early 1980s, the hospital costs of childhood obesity were estimated at $35 million whereas in the late nineties, the cost was estimated at $127 million (Zametkin et al., 2004). Obesity and obesity-related diseases such as gallbladder disease and sleep apnea saw significant increases during this period of 197%, 228%, and 436% respectively. These increases in hospital stays for obesity-related diseases further highlights the economic impact of obesity on society as well as the increased prevalence of childhood obesity.

Physical Activity Habits

Habits are often described as unconscious patterns of behavior that occur from frequent repetition (Lally, van Jaarsveld, Potts, & Wardle, 2010). When habits are formed, an individual has established a routine of maintaining a certain level of skill, dependence, or tradition. Many adult behaviors are established during their high school career and early adulthood in college (Buckworth & Nigg, 2004). Therefore the

establishment of healthy habits of physical activity during adolescence in high school can help individuals have a healthy lifestyle and be able to maintain physical activity into college and throughout adulthood (Irwin, 2007). The International Platform on Sport and Development (IPSD) (2011) indicated that sport participants have a greater ability to form life-long habits of physical activity than those that do not participate in sports. One way that high school students can adhere to healthy physical activity habits through sports is through competition in high school athletics.

Overview of the History and Purpose of Sports

Sports in the United States date back to the early Native Americans and further when viewed on a global platform. Around the world, remnants of athletic courts and fields used by various societies for games of sport can still be found. Often games were used in preparation for adulthood by younger members of society. Skills in food acquisition and survival were important for many societies and every member of the society played an important role in the process. Games were also used in ceremonial practices to worship, praise, and thank the god or gods of that particular society. Many games evolved into trying to imitate the gods or to become like them. In the ancient Americas, the Mayans played a game named pok-a-tok which involved a large football sized field, a small rubber ball, and stone hoops suspended high on the walls (Russell, 2009). Russell (2009) elaborated that teams of seven would play the game against one another trying to get the ball through the stone hoops. The winners were then treated godlike by the society, specifically in this society becoming akin to the Sun God. Some societies would even sacrifice the winners as an offering to the gods (Russell, 2009). This game focused on many aspects of wellness through competition. The game required

physical fitness, strategy, teamwork, and the winners were elevated to a godly plane in society. It is easy to make the connection that this game resulted in heightened physical, intellectual, social, and spiritual wellness for the participants.

Ancient Greece was similar in their sporting activities. The multiple gods that were worshipped were seen as perfected beings in both physical and intellectual capacities. The Greeks established four main sporting events known as the Panahellenic Games (Russell, 2009). Each event was held in different regions of the country, on different years, and focused on worshipping different gods. The Pythian Games in honor of Apollo combined both sporting events and competition in the arts including music, theater, and art. The Naemean Games were held in honor of Zeus and focused on the traditional sporting events of the time including various races and wrestling. The Isthmian Games were held in honor of Posiedon and also focused on the traditional sporting events of the time. The fourth Panahellenic game is the most well-known and continues to be offered today for a global society known as the Olympics. In honor of Zeus, the Olympics provided an opportunity for each city to send a representative to compete in the various sporting events offered. The events offered during these games were mainly individual sporting events but required a high level of physical ability. With the Panahellenic games being offered in alternating years, it required the Greeks to maintain a level of physical fitness in order to represent their home state or country during each Panahellenic Games. These competitions provided a reason for the Greek society to develop and maintain physical activity habits during late adolescence, early adulthood, and for some middle adulthood. The Olympic Games added an additional unique aspect for society by enacting the Olympic Truce. The truce was used before and

during the Olympics to ensure safe travel for the participants to and from the host city (Toohey & Veal, 2007). This truce also suspended any wars currently in progress and put legal disputes on hold. This gave the host city and participants protection to prepare for the games and to compete. This social experiment can be related to improving overall social and spiritual wellness of the society. The Olympic Games helped society put aside its differences for a short period of time to come together in unity of competition and worship of the gods.

The Olympic Games were later suppressed by the Roman Empire when Christianity was being introduced as the religion of the empire. Sporting events continued to be offered through the next several centuries but were separated from the religious purposes used by the Greeks and Native Americans. As European countries were expanding across the sea to the Americas, various religious thoughts sought to control or restrict sports. Sports on Sunday become a debate as more colonies were established with different religious perspectives. As the Puritans established colonies in New England, they wanted strict control over sports. However, the Church of England had different views. King James wrote a book titled the *Book of Sports* in 1618. In this book, James describes how sports were needed for military, political, and health reasons (Gems, Borish, & Pfister, 2008). James even indicated that after attending church services on Sunday, mild manner and appropriate sporting events were fully acceptable on the Sabbath. This proclamation demonstrated the understanding of how sporting activities could be aligned with spiritual wellness as well as improving social and physical wellness through participation in sports with religious congregations.

Gems et al. (2008) reflected on the history of sports during the industrial revolution and how it was the starting point for high school athletics. During this time, the upper class was transitioning from agricultural work, which was physical in nature, to less physically demanding jobs of management. At the time, sports were less favorable because of current perceptions but the realization of the upper class not being physically active in childhood and later in life became a concern. Enlightenment about the effects sports has on the body become a focus for health advocates. John Locke, who developed influential philosophical theories about the human mind, and Isaac Newton, who worked on understanding the laws of nature, were fascinated by the body and how it functioned. Locke and Newton believed that youthful recreation was required if society wanted youth to grow up to be productive, creative, and strong citizens (Gems et al., 2008). Both advocated for youth to spend two hours per day in physical activity, one hour in the morning and one hour in the evening. The push from advocates like Locke and Newton focused on youth being able to participate in exercises through sports and recreation. Sport advocates of that time focused on the idea that youth should obtain a stock of health through sport participation. These recommendations focused on a way to offset the lack of physical training in youth and to develop healthy habits for later in life. Because of the efforts of physical health advocates, physical education started to become recognized and needed for young men. The thought was, as political leaders of the community, the type of work individuals engaged in was not physically demanding and therefore youth should be exposed in school to learn to be active and develop physical activity habits. Universities later began to establish physical education curriculums to meet this need for physical activity. Institutions of higher education including Harvard, Yale, Brown,

Columbia, and William and Mary were focused on preparing students for political and public positions. The curriculum focused on the body, mind, and soul and integrated regular physical activity into the academic life to help students maintain a strong mind and body (Gems et al., 2008). Youth became more productive, active, creative, engaged, and efficient in their labors when they were physically active. Physical education curriculums continued to be developed and restructured in institutions of higher learning from this time forward.

In addition, military leaders during the Revolutionary War documented the physical ability of their soldiers and indicated that those involved in sports before the war had greater physical ability than those that did not (Gems et al., 2008). Because of these observations, military leaders helped establish a new political view for sports as the new government was in its infancy. The new perspective on sport focused on encouraging individuals to pursue sporting activities for physical well-being. As a result, society started to value sport for its moral and physical benefits. These values of sport participation were seen through improved wellness and overall quality of life.

During the late 1700s and early 1800s, the second Great Awakening occurred, spreading spiritual revivals across the Unites States. This Great Awakening paved the way for reform throughout the nation, all of which seemed to be based on equality, morals, and physical fitness. As the United States became more urbanized, society became more sedentary. Immigrants flocked to these urban areas and diseases like dyspepsia seemed to occur and were linked to poor eating habits, which also led to physical inactivity. Many health reformers during this period saw health and physical well-being as moral obligations. This obligation could be to God, community, race, the

nation, or even to oneself but to be unhealthy was seen as immoral. The gospel of health exemplified the religious zeal of this time (Gems et al., 2008).

One of the bigger movements that occurred during the antebellum period was the Muscular Christianity movement. Thomas Wentworth Higginson was a Christian that believed the body and mind both needed to be aligned with the gospel. This idea explained that the body was a temple of God and must be treated as such and taken care of appropriately. Higginson believed by cultivating the body through physical activity and abstaining from unhealthy vices, such as alcohol and bad foods for the glory of God, an individual would develop strong morals and build character (Gems et al., 2008). Although healthier foods and diets have always been a part of religious sermons, it was not common to promote physical activity within Christianity. Higginson advocated that people should embrace muscles and morality as the body and spirit together was the soul of man and God required perfection of both. Higginson further recommended that participation in sports would resolve this issue of ignoring the laws of health and that sport reform was needed in religion. Higginson elaborated by stating sports were essential to building character, leadership, competitiveness, courage, teamwork, and discipline. These characteristics would then be transferred over into society by helping individuals pursue the American dream as moral citizens of America. This movement is why many believe sports are widely accepted as appropriate leisure activities within many religious institutions as well as accepted by the nation as a whole. This movement also led to the establishment of two of the more common health organizations in America, the Young Men's Christian Association (YMCA) and the Young Men's Hebrew Association (Gems et al., 2008).

Women rights were an issue as well during the 1800s. The idea that being feminine did not include physical vigor was common. Many started to believe that in order for women to carry out their duties of womanhood, women needed to be in top health (Gems et al., 2008). Catharine Beecher was one of the strongest advocates for women's physical activity. Beecher founded an all-female seminary in 1823 that included education on domestic duties as well as physical education. Beecher developed calisthenics, which were later published in her book in 1856, for women to use household items to increase flexibility and overall health. She believed, as did many women's right advocates, three areas could be improved for female physical activity: physical education, outdoor sport opportunities, and clothing restrictions (Gems et al., 2008). These changes slowly started to evolve as time passed.

The sport of baseball was one of the first fully developed sporting activities accepted in the United States and has become known as America's pastime. Games were recorded as being played as early as 1838 (Gems et al., 2008). Baseball was unique because it provided common ground between urban and rural citizens. The game quickly spread along the eastern coast and as far west as St. Louis. It seemed as though everyone was able to participate in baseball regardless of social status. Although, there were different leagues for different social classes everyone was able to find a way to play unlike other common sports at the time, like sailing, which was only available for the upper class. Baseball led to other sports, including racket sports and gymnastics, being developed and offered to different social classes and eventually to everyone.

During the Civil War most sports came to a halt. However, when the war ended, sports seemed to start where they left off. Soldiers that were physically active through

the war desired to stay active after the war. The Civil War no longer hid the fact that many of the nation's men and women were unfit, mentally and physically, for the toils of war (Gems et al., 2008). Many political and military leaders agreed that better training was needed in order to preserve the United States in the future. This led to the agricultural land grant system (Gems et al., 2008). Under this grant, colleges and universities were established to receive federal money for training and educational purposes. The idea was to establish training for young men to be physically and mentally prepared. The Morrill Act of 1862 was also established allowing for public education to be available to most on the college level (Gems et al., 2008). This also included the establishment of athletics being integrated with academics. The Morrill Act provided community structures and resources necessary to develop major athletic programs across the nation. These athletic programs were used to train sturdy physically energetic students. Athletic programs at the time operated similar to a club sport where the players were also the coaches. Yale University was the first to hire an athletic coach, in 1864, due to the heated competition with Harvard University in rowing and boat races (Gems et al., 2008). Coaches began to be hired across the nation to help train, guide, and motivate athletes to reach their potential in and out of athletic parameters.

Coaches also enhanced the competition in athletics because their employment status became dependent on their ability to win. This led to new recruitment efforts and the establishment of highly competitive sports in college. This trend also started to attract outside organizations that wanted to sponsor athletic contests, fields, equipment and so forth. During this time, sports started to change and split into two categories of amateur and professional sports. This was the start of the sport business. Business

principles were applied to the sporting environment through marketing, sponsorships, player contracts, ticket sales, facility construction, and larger winning purses (Gems et al., 2008). The purpose of sports was starting to change from developing healthy lifestyle in society and having fun to the business of winning and making a profit.

At the turn of the 20th century, Americans saw the greatest growth and innovation within the sporting world. Football was becoming increasingly successful on college campuses and was transitioning into the professional sphere as well. Two new sports, basketball and volleyball, were developed based on physical education curriculums. With the creation of new sports and baseball and football continuing to grow in prominence, sports became a vehicle for social causes and the social reforms of the nation specifically racial and gender reforms (Gems et al., 2008). In addition, sports started to became more focused on social relationship and unity which came in the form of teamwork (Gems et al., 2008). The idea of unity with teammates was strengthened as players stood by their teammates during these times of social reform. The improvement of individual social and emotional wellness was greatly enhanced by the support of teammates. Social wellness was also enhanced with the resurrection of the Olympic Games which focused on global unity (Gems et al., 2008).

The 1920s continued to help shape the new era of sports. Referred to as the golden age of American sports, Bohn (2009) believed this era changed the individuals that played sports as well as the spectators that watched sports. Sports were treated like a religion and became a major cornerstone of American life. Bohn (2009) contributes the modern sports era, focused on advertising, wealthy franchises, passionate fans, and huge sport facilities to the 1920s. Athletes in almost every sport became successful during the

1920s which helped change the focus of sports to becoming a profitable business with healthy lifestyles as a byproduct of participation. This change in focus ushered in a change in sport opportunities for youth. Youth started to dream of the potential of playing sports on a bigger societal stage. Athletics offered by educational institutions became more competitive, youth sports started to be coordinated by community recreation agencies. The goal of the recreation agencies was to build individual character, foster social relationships, and develop a healthy lifestyle (Gems et al., 2008).

In summary, these trends in sports have stayed consistent into contemporary society. Educational, amateur, and professional sports continue to focus on winning with the potential for financial gains to those involved. Physical education curriculums continued to evolve and include recreational sports to help individuals develop basic skills and knowledge of sports that would hopefully lead to a stronger sense of health and wellness. Leisure service agencies continue to provide skill building opportunities through sports with a transition of minimal competition, all of which are focused on developing healthy lifestyles.

High School Athletics

The National Federation of State High School Associations (NFHS) was created in 1920, and currently holds its headquarters in Indianapolis, Indiana. The association serves and collaborates with members of 50 state high school athletic and activity associations, and the District of Columbia. The association uses interscholastic sports and activities as educational vehicles to help students succeed not only in sports but in life. The NFHS (2011a) purpose is to build awareness and support for athletic programs, establish consistent standards and rules for athletic contests, improve the athletes and

spectators' experience, and help those who supervise and direct high school sports and activities. The organization's objectives include many different areas including the development of good citizenship and healthy lifestyles (NFHS, 2011b).

According to Kaczynski and Crompton (2006), local government agencies allocate almost 35% of expenditures to education. Education includes the athletic programs sponsored by the school. High school athletics consist of the many extracurricular activities that are sponsored by the specific high school along with districts, state, and national associations. The activities usually take place after school and on occasion during the weekend. Each school in a district will sponsor a team in each respected sport season and will compete against other high schools. Athletics allows students an opportunity to compete against other students in extramural contests. There are 18 different sports that are currently sponsored by the NFHS (2011b). However, a school may choose to sponsor more or less than the NFHS. The 18 sports that are sponsored are divided up between three different seasons: fall, winter, and spring. Each season may have as many as five or six sports available to students. Each season allows students to participate in athletics that use the guidelines established by the NFHS (2011b), which include developing healthy habits that will provide a basis for a continued path toward a healthy lifestyle. As of 2006, 91% of high schools in the United States offered varsity athletic programs known as extramural sports to their students (Lee, Burgeson, Fulton, & Spain, 2007; National Association for Sport and Physical Education & American Heart Association, 2006). Cohen, Taylor, Zonta, Vestal, and Schuster (2007) reported that the average school offered 14 sport programs to students with an average of 31% of the student body participating in sport programs. Larger schools

reported more sport programs than smaller schools. In addition, schools in lower socioeconomic neighborhoods offered fewer school sponsored sport programs. There was a significant difference in when schools offered 13 or less sport programs compared to 16 or more sport programs when looking at student participation. When a school offered 13 or less sport programs, only 14% of the student body participated in sports as opposed to 31% of students that participated at schools that offered 16 or more sport programs.

High school athletic programs have been associated with physical activity from the start of school sponsored sport programs (Gems et al., 2008). Sport participation in any structured format can be a tool to increasing physical activity. However, sport participation can also be related to physical wellness and physical fitness. Renfrow, Caputo, Otto, Farley, and Eveland-Sayers (2011), conducted a study examining if there was a relationship between sport participation and physical activity in students in middle and high school. The Fitnessgram testing procedure was used to indicate if students that participated in sports were within the healthy fitness zone. The study included 246 students from a private school in grades seven through 12. The components of physical fitness test included measurements in body composition, muscular fitness, flexibility, and cardiovascular fitness. Students must reach specific point levels to be considered in the health fitness zone. Skin folds on the triceps and calf muscles were used for body fat percentage. Modified pull-up and abdominal curl-up tests were used to measure muscular fitness. The Acuflex I sit-and-reach box measured muscular flexibility. Cardiovascular fitness was measured by using a running test requiring students to run back and forth over a 20-meter interval while increasing speed. Students also indicated if

they participated on a sports team in the past 12 months. Students indicated the number of teams ranging from zero to three or more. Chi-squared analyses examined the relationship between the healthy fitness zone and sport participation. The results found that males that participated in more sports achieve more healthy fitness zones than males that participated in fewer sports. However, there was no difference in achieved healthy fitness zones among females and sport participation. Renfrow et al. (2011) indicated the choice of sports among females may be the cause for the non-difference is healthy fitness zones. If females participated in less vigorous sports, such as golf, it is possible that females that do not participate in sports could have similar healthy fitness scores.

Renfrow et al. (2011) stated, "encouraging students to participate in some form of organized sport, teachers can aid students in achieving healthy physical fitness levels and give them a foundation and appreciation for life-long physical fitness" (p. 122). In addition, if schools are able to offer more sport participation opportunities to students then the sport participation may increase opportunities for physical activity. Renfrow et al. concluded that sport participation in adolescence could curb childhood obesity and lay a foundation for healthy living later in life. Although the study discovered females did not improve their physical fitness based on sport participation, it is important to note that males did increase their physical fitness when sport participation was increased.

High school athletics can also be related to emotional and social wellness. This may be a result of working together within a team setting for social wellness as well as learning how to improve skills and accomplishing goals for emotional wellness. When youth have a strong foundation for self-esteem and self-efficacy, which can be related to social and emotional wellness, they may be less susceptible to behaviors considered high-

risk in adolescents. Cohen et al. (2007) investigated how many after school sport programs were available to students and if there was a relationship with risky behaviors in youth. There were 175 schools included in the study and there were no significant differences between the neighborhoods of each school. The local police department provided juvenile arrest rates. Teen births rates were provided by the county Department of Health Services. The county Department of Health Services also provided information on sexually transmitted diseases. Cohen et al. reported schools that offered 16 sport programs or more reported an average of 1.7 juvenile arrests per 10,000 youths whereas schools that offered 13 or less sports reported an average of 30.9 per 10,000 youths. When considering teen birth rates, results were not linear to provide conclusive evidence. However, there were significant differences among schools offering 11 sports compared to schools that offered 17 sports. School that offered 11 sports averaged 26 teen births per 1,000 and schools that offered 17 sports averaged 19 teen births per 1,000. There were also differences in the rate of sexually transmitted diseases (STDs) when considering sport participation. In schools where 15-25% of students participated in athletics, the STD rate averaged 5.3 per 1,000 whereas in schools where 35-45% of students participated in athletics the STD rate was 2.2 per 1,000. The associations observed between juvenile arrests and sport opportunities in schools show a possible relationship to reducing risk behaviors among youth. Small rates in teen births had a statistically significant association with sport program offered at schools as well as the lower rate of STDs when more students participated in sport programs offered by the school. Cohen et al. concluded by stating “further studies should test whether increasing opportunities for physical activity will result in more physical activity and lower risk

behaviors" (p. 85). These findings may be contributed to an increase in emotional and social wellness that may result from sport offerings and participation.

There are, however, a few negative aspects to high school athletics. The main negative aspect is the reality that only the best players get to play the sport. Some sports do not cut students from the team, but the majority of the sports have try-outs and end up cutting students from the team until the roster is filled. Cutting students from athletic teams leaves many students without the opportunity to participate in high school sports, but more importantly it eliminates the opportunity to develop healthy habits through those structured sports.

Theory of Planned Behavior

Many high schools only offer one team per sport, which limits the number of players needed to play (Cohen et al., 2007). Therefore, the majority of students in high school are not participating in high school athletics. The Theory of Planned Behavior may be a plausible option for improving the health of students that do not participate in high school athletics. The Theory of Planned Behavior extends the Theory of Reasoned Action (Ajzen & Madden, 1986; Madden, Ellen, & Ajzen, 1992). The Theory of Reasoned Action (Ajzen & Fishbein, 1980) states that an individual will have intentions of participating in an activity when the individual has positive attitudes towards the activity. In addition, the theory suggests that an individual will have intentions to participate in an activity when the opinions of others about the activity are the same as the individual. This is called the subjective norm. Therefore the positive attitudes about the activity coupled with the subjective norm would lead an individual to the actual behavior of participation. For example, if the individual has a positive attitude about

playing basketball and the individual's family members also have a positive attitude towards basketball and believe the individual should participate in basketball, then the individual is very likely to participate in basketball according to the Theory of Reasoned Action.

The Theory of Planned Behavior extended the Theory of Reasoned Action by adding a third dimension of individual behavioral control, or in other words the individual's belief in their ability or skills related to the activity (Ajzen & Madden, 1986; Madden et al., 1992). The Theory of Planned Behavior argues that intentions are not the only predictor of behavior but that an individual's ability to control the activity must be considered. For example, even though the individual has a positive attitude towards playing basketball and the family strongly supports the individual to play basketball if the individual has the perceptions that he/she does not have the ability or skills needed to play basketball then the individual may not participate in the behavior of playing basketball regardless of intentions.

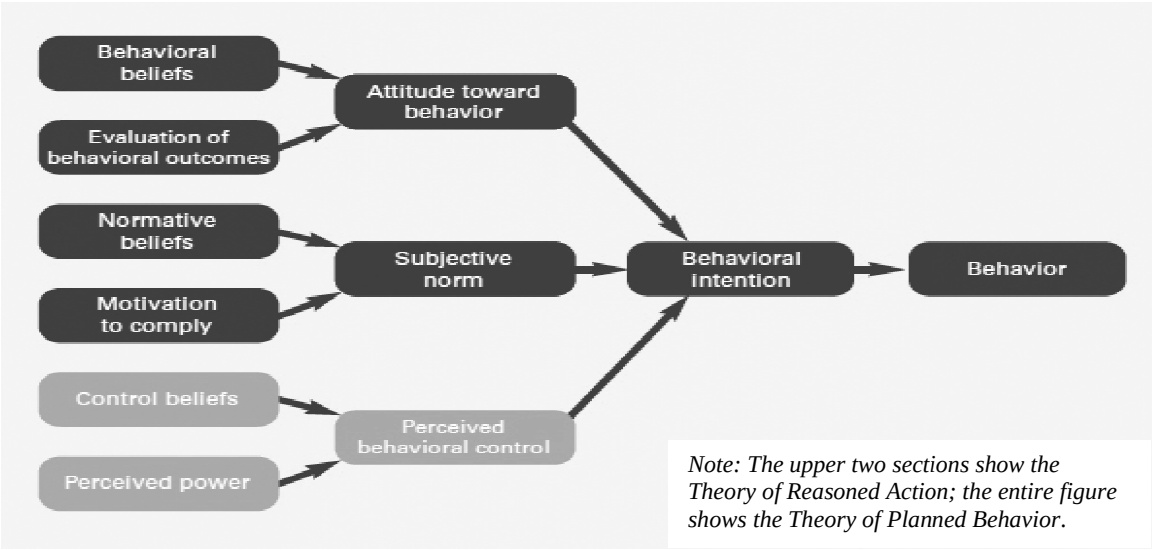

Figure 1. The Theory of Planned Behavior (United States Department of Health and Human Services, 2005).

This may be the reason individuals may not maintain proper physical activity while transitioning through the lifespan. If individuals are being restricted from participating in athletic competition due to the lack of skills compared to others, the cut players may have a diminished perception of their skills to participate in athletic activities later on which may lead to physical inactivity. Therefore, according to the Theory of Planned Behavior, if there were more opportunities for youth to develop the skills and abilities needed to adopt physical activity, it may be more likely those physical activity behaviors could become habits and be maintained while transitioning through the lifespan. This is assuming the individual continues to have a positive attitude about the behavior and has the social support needed for continual intentions to participate.

Physical Education

Physical education courses do provide an opportunity for youth to learn about physical activity and wellness. Physical education curriculum includes the demonstration of proper physical activity that improves overall health and wellness. However, with the rise of the obesity epidemic and other health concerns linked to physical inactivity, many health professionals are wondering how the educational environment of K-12 affects unhealthy lifestyles. As reported by Cawly et al. (2006), the requirement for physical education is being reduced across the United States as the number of overweight and obese youth is on the rise. For example, the percentage of students in high school that participated in daily physical education has dropped 14% from 42% to 28% between 1991 and 2003 (Cawly et al., 2006). The same trend can be seen in elementary and middle schools as well. The reduction in physical education for these education levels has even been affected by the reduction of recess. The United States Department of

Education reported that 14-18% of children in the elementary grades average 15 minutes or less of recess per day (National Center for Education Statistics, 2007). Many schools have even eliminated some of recess to allow more time to focus on the core subjects of mathematics, communication arts, social studies, and science (Clements, 2000). In addition, many educators have used recess as a disciplinary tool by not allowing disruptive students the opportunity to have recess. Many of these class disruptions may be caused by the lack recess because of the many benefits that are not recognized by allowing children to have free play in the form of recess. The National Association for Sport and Physical Education have cautioned schools to not let students be inactive for longer than two hours at a time because of the risk of losing student engagement and cognitive functioning in the classroom (Council on Physical Education for Children, 2001). It is important for schools to follow the recommendations set forth by the United States Department of Health and Human Services (2001) to implement programs that provide children the opportunity to receive a major portion of the recommended 60 minutes of moderate to strenuous physical activity each day.

Students are supposed to have the opportunity to participate in 150 minutes of physical education per week in elementary schools and 225 minutes of physical education per week in secondary schools. Sadly, according to the School Health Policies and Programs Study (SHPPS) conducted by the Centers for Disease Control and Prevention (2012b) less than 4% of elementary schools, less than 8% of middle schools, and less than 2% of high schools provided enough opportunities for physical activity. Cawly et al. (2006) also indicated that as physical education is being reduced in the school setting, students will most likely not compensate for the lack of physical activity outside of

school but rather choose to be less active at other times of the week during free time. These research studies add additional concerns to educators and administrators that are already being imposed on by legislation to increase students' exposure to mathematics, social studies, and sciences. Federally mandated programs like No Child Left Behind (NCLB) and associated testing standards are reducing school administrators ability to offer academic electives like physical education and fine arts. The responsibility of educators to improve student achievement has had a negative impact on the priority and offering of physical education in K-12 schools.

The link between being healthy and student achievement has been a research topic spurred by these changes in education. A comprehensive review of the research was analyzed by the Council on Physical Education for Children (2001) and concluded that students that participated in daily physical education classes had improved concentration, more positive attitudes towards learning, and overall better academic performance. In support of the research, the President's Council on Physical Fitness, Sport, and Nutrition (1999) tried to encourage schools to implement physical education for each level by issuing a statement that time spent in physical education classes often helped students do better in other subjects and did not hinder learning in other classes, according to the research. Although the research supports regular physical education in schools, it seems not common in public education. Health organizations continue to encourage school systems to be the leaders in promoting healthy lifestyles. The Centers for Disease Control and Prevention (2012b) stated education institutions could have the greatest impact on healthy lifestyles because schools reach nearly all children and have an existing infrastructure to offer physical education. Many health organizations have even

gone as far as proposing legislation action to increase the amount of physical education classes in schools (Cawley et al., 2006). According to Cawley et al. (2006), 44 states introduced legislative bills to increase physical education in 2005 due to the rising health problems that are plaguing America.

Intramural Sports

Physical activity is a critical component for development and healthy growth during childhood (Flynn et al., 2006; Strong et al., 2005). Schools are perfect places to promote physical activity in childhood because of the myriad of opportunities to be physically activity that may be available for youth (Flynn et al., 2006; Trudeau & Shephard, 2008). Educational institutions have recently started to offer more athletic programs in the form of intramurals. Although the concept of intramurals is a positive step forward, there are several concerns. One of the purposes of intramurals is to provide an opportunity for youth to be physically active. There are also intentions to improve social relationships through teamwork, develop skills in the specific intramural sport, and to improve the overall wellness of the participants. All of the intentions may be reached during the activity but may not be sustained after the intramural activity ends. This is due to the limited structure of the activity. These limitations include few, if any, qualified coaches, inconsistent and rare, if any practices, and the perception of playing just for fun and not focusing on developing healthy habits. These opportunities, when compared to the resources and structure of school sponsored athletic teams, are not preparing youth for a lifetime of good health and wellness. However, some research does indicate intramurals can produce positive results for healthy lifestyles (Williams, 2008).

Intramural sports may be one way to increase physical activity in adolescents. Intramural sports allow all students with a variety of abilities the opportunity to participant in programs that are both competitive and non-competitive sports within their own school (Voltmer Esslinger, McCue, & Tillman, 1979; Williams, 2008). The Centers for Disease Control and Prevention (n.d.) indicated that intramural sports may be viable options to increase physical activity levels during childhood and adolescence by helping students integrate purposeful physical activity into their daily routine. These opportunities may also provide a basis for developing healthy habits that are maintained beyond graduation.

There are multiple reports that indicate school-based physical activity programs, which include both intramural and varsity athletic programs, are effective in increasing physical activity levels for children and adolescents for the short term (Pate, et al., 2005; Strong et al., 2005). This indicates more research is needed to understand if these programs can have a lasting effect on physical activity levels when students move on from the K-12 setting. Fuller et al. (2011) examined if there was a relationship between the number of sports offered through intramural and extramural programs in high schools and the total, moderate, and strenuous physical activity levels during adolescence and during the transition into young adulthood. The study included 808 participants from 10 high schools in Canada from the Nicotine Dependence in Teens (NDIT) study, which used a convenience sampling procedure. Physical activity levels were recorded using a self-reported questionnaire at 12-13 years of age, which was the baseline report. Physical activity levels were recorded every three months during the school year for five years and once after graduation when participants were the average age of 20. Twenty-one reports

were collected in total. The instrument used for data collection was a 7-day recall based questionnaire that asked participants to indicate the number of activities they participated in during the past week. Activities were grouped into light, moderate, or strenuous activities based on estimated energy expenditure. The total number of physical activity sessions was computed. In addition, school principals and vice principals completed a checklist indicating which intramural and extramural sport programs were offered at their schools. Schools were then grouped into four categories of high intramural sports, low intramural sports, high extramural sports, and low extramural sports (Fuller et al., 2011).

Fuller et al. (2011) analyzed the results using a Spearman's rank order correlation coefficient to determine the relationship between physical activity and the availability of sports at each school. In addition, a multilevel general linear model was used to analyze individual physical activity and school sports while adjusting for reported characteristics. The multi-level approach examined the relationship between total, moderate, and strenuous physical activity and each of the intramural and extramural athletic opportunities. Fuller et al. (2011) discovered there was not a significant correlation between the number of intramural athletics and the number of extramural athletics according to Spearman's ranking system. However, the multi-level linear model indicated 3.6 more physical activity sessions weekly for students in high intramural schools when compared to students in schools that offered a low amount of intramurals. There was no difference in physical activity levels based on comparing schools offering a high number of extramural programs with schools offering low number of extramural programs. Students in schools offering a high number of intramural sports participated in 1.3 more strenuous physical activity sessions than students in low intramural sport

schools. The analysis showed students attending schools with more intramural sport opportunities were more active in both total and strenuous physical activity than students that attended schools with low intramural sport opportunities. Therefore, students at schools with limited intramural sport opportunities may not be able to meet the recommended physical activity guidelines of 60 minutes of moderate-strenuous physical activity daily. In addition, multiple studies have reported that in the United States only 45% of high schools offer intramural sport opportunities and many schools have completely eliminated extracurricular physical activity programs because of decreased or limited budgets or the lack of priority (Lee et al., 2007; National Association for Sport and Physical Education & American Heart Association, 2006). These eliminations further compound the physical inactivity situation in adolescents and may be contributed to future chronic diseases due to physical inactivity in childhood and adolescence.

Fuller et al. (2011) reported their findings did not indicate extramural sports were found to have an association with increased physical activity at either low or high extramural sport schools. This may be caused by extramural sports being limited to highly skilled players and not available to the general student body as a whole. There was not a comparison between intramural participation and extramural participation. This point supports the need for more research in determining if extramural sports (high school sponsored athletics) can increase physical activity levels by comparing physical activity levels of those that participated in extramural sports to those that did not participate in extramural sports.

Other Activities

Opportunities for students to develop healthy habits outside of high school athletics, intramurals, and physical education are few and far between. Reducing behaviors of sedentary lifestyles depends on the availability of other activities that are accessible by students (Epstein et al., 2006). Chores are considered a type of exercise that can contribute to physical activity (Ainsworth et al., 2000). Chores can range from household work of vacuuming and doing dishes to outdoor work such as gardening and mowing the lawn.

Epstein et al. (2006) documented whether or not sedentary lifestyles of youth eight years to 15 years old increased or decreased when sedentary behaviors were increased and decreased. Epstein et al. (2006) listed sedentary behaviors as watching television or videos, using a computer for leisure purposes, and playing video games. In order to examine if sedentary behaviors would increase or decrease based on accessibility, the authors used three phases to collect data. The first phase was a baseline phase where the authors examined the accessibility of sedentary behaviors without the author's influence. During the second phase, the authors increased accessibility to sedentary behaviors. During the third phase, the authors decreased the accessibility of sedentary behaviors. Participants recorded their physical activity during each phase. Epstein et al. (2006) discovered that participants that lived near a park reported greater increases in physical activity during the decreased sedentary behavior phase or the third phase. Therefore greater access to parks may pull children away from activities that support sedentary behavior and therefore increase the likelihood to be physically active.

Neighborhood parks are one example of many outdoor opportunities that provides a place to be physically active (Bedimo-Rung, Mowen, & Cohen, 2005). Parks provide youth and adults a variety of opportunities for physical activity. The park could also provide a greater variety of activities which could have a potential influence on physical activity (Giles-Corti et al., 2005). Structured programs that are not sponsored by high schools are offered by community and private organizations but usually cost more money to participate than high school athletics would cost. Thus, the students are left with outdoor recreation opportunities which adolescents seem to have negative attitudes towards (Westerstahl, Barnekow-Bergkvist, & Jansson, 2005). Unfortunately these opportunities appear to be limited and educational institutions remain the main focus for providing physical activity. Youth physical activity can also revolve around structured athletic community little league programs.

Transitioning Through the Lifespan

Erik Erikson, a German psychoanalyst, analyzed human development across the lifespan and created his theory of the psychosocial stages of development. The stages of development theory suggest that everyone must pass through eight specific but interrelated stages of development during their life (Allen, 2005). The stages of development are based on considering the impact of external factors, family, and society on personality development from infancy to late adulthood. Each stage presents different life situations, learning opportunities, and development issues associated with the age range of that particular stage. How an individual works through each stage determines specific outcomes that may have a lasting effect throughout the lifespan.

The eight stages include infancy (birth to 18 months), early childhood (18 months to 3 years), preschooler (3 to 5 years), school age child (6 to 12 years), adolescence (13 to 18 years), young adult (19 to 34), middle-aged adult (35 to 54), and maturity (55 years to death) (Allen, 2005). It should be noted that Barnett and Blanco (2013) described similar stages but only list seven stages because they combined Erickson's early childhood and preschooler stages into one stage called early childhood. Many of the characteristics presented by Barnett and Blanco come from the foundation that Erikson developed.

Erikson described the infancy stage as a time when trust and mistrust are developed. Children are able to develop a sense of trust when a caregiver provides care, affection, and reliability whereas when those aspects of life are not provided a child will develop a sense of mistrust. Early childhood is a time when children try to gain autonomy through their physical skills. During this stage, it is important for children to develop a sense of control over themselves which will lead to a sense of independence. When a child is successful in controlling physical skills, such as toilet training, they gain a sense of autonomy whereas when they fail to control their physical skills they may have feelings of shame or doubt (Allen, 2005). The lack of confidence in skills can stagger through several stages and even into adulthood, which may have a negative effect on the overall wellness of an individual. The preschool stage is a time for children to explore their surroundings and be praised for their initiative or scolded for their actions (Allen, 2005). Children will begin to gain control over the environment and when met by approval from family and friends can lead to a sense of purpose whereas if the actions are met with disapproval from family and friends the child may gain a sense of guilt. When children enter the school age stage they are exposed to greater aspects of societal

influence. The ability for children to cope with the new social, as well as academic demands will either lead to a sense of competence or a sense of inferiority depending on the child's success or failure in this stage (Allen, 2005). These outcomes may have a great influence on the type of physical activity a child pursues if any. Sports become more skill based during this stage and the child also needs to learn to adapt from the transition of playing just for fun to not only playing for fun but for competition as well.

The adolescence stage is the time when youth begin to establish their identity in a social context. When an individual in this stage is able to develop a sense of self and personal identity they become strengthened in their ability to stay true to themselves. On the other hand, when an individual is not able to develop a sense of self and personal identity, they may have confusion on their role in society and have a weak sense of self (Allen, 2005). Because Engh (2002) discovered children dropping out of sports at an alarming rate during this stage, it may be important to explore what societal role the individuals in adolescence are assuming to understand why youth are dropping out of sports. The combination of the school age stage dealing with inferiority and the adolescence stage with role confusion may be a factor in youth sport drop-out rates which may have a negative effect on future physical activity habits and overall wellness later in life.

As youth finally cross the barrier to adulthood, the first stage is young adulthood when personal relationships become the focus. The need young adults have for intimacy and loving relationships with other people may lead to higher self-esteem and stronger relationships in the future or to results of loneliness and isolation (Allen, 2005; Barnett & Blanco, 2013). The team concept of sports may be a viable option for young adults to

maintain these relationships which have a direct correlation with both social and emotional wellness and have a byproduct of continual physical activity. However, the experiences of sports in adolescence may contribute to these potential team relationships in a positive or negative way. Middle adulthood is the time when most individuals have a desire to be successful in personal and social contexts (Allen, 2005; Barnett & Blanco, 2013). This may include leaving a legacy at work and, or through, having children. The focus for many individuals in this stage is to make a positive change for society. This leads many individuals to change their current path and develop a better sense of purpose. Being successful in this endeavor may lead to feelings of usefulness and accomplishment while failure to do so may lead to isolation as the individual purposely closes them self off to society. The purpose of this stage may lead many that have become physically inactive to become active once again. How they become physically active may be explained by their previous experience in sports during an earlier stage of life. The final stage of maturity is a time of reflection to assess one's life and determine if it was a success (Allen, 2005; Barnett & Blanco, 2013). When individuals in this stage feel a sense of fulfillment, they may gain a sense of wisdom and satisfaction whereas if the reflection of their life is viewed as a failure they may develop feelings of regret and despair (Allen, 2005). Both outcomes may contribute to a continued or renewed sense of physical activity. The multiple health benefits of physical activity may be desirable for those that feel their life was a failure by providing them with an opportunity to become healthy and still make a positive change in society. For those that feel a sense of fulfillment, continued or renewed physical activity may be attractive to them so they can continue to experience the positive change they have made in life. The development of

the physical activity skills and stability of overall wellness earlier in life may be a factor in determining how individuals in this stage participate in physical activity as well as in any adult stage of development.

Transtheoretical Model

Considering the changes that may occur in each psychosocial stage of development, it may be possible for individuals to be active early in life and later be physically inactive and then become physically active again. In order to better understand these changes and motivations for maintaining, quitting, and starting habits of physical activity, an examination of the transtheoretical model may provide a clearer understanding of this potential process of change.

The transtheoretical model, also known as the stages of change, was developed by James Prochaska starting in 1977 as a way to understand why people make and do not make changes in health behaviors. Prochaska, DiClemente, and Norcross (1992) suggest that individuals transition through stages of change until stable behavior is adopted. The stages of change theory is considered to be a cyclical pattern of change with an entrance and exit but is cyclical because many people are not successful in establishing and maintaining behavioral changes. Therefore, a relapse in behavior is common and the individual will continue in a circular pattern, but with continual effort it is hopeful that an individual would eventually progress and adopt a healthier behavior leading to a better lifestyle. The model has also been used in multiple studies looking at negative health behaviors including understanding changes in exercise and physical activity (Cheung et al., 2007; Pinto & Marcus, 1995; Spencer, Adams, Malone, Roy, & Yost, 2006; Sarkin, Johnson, Prochaska, & Prochaska, 2001).

The transtheoretical model is comprised of five different stages an individual would transition through when changing a behavior. Wienberg and Gould (2011) have described the five stages of change as it applies to exercise and physical activity. The first stage is the pre-contemplation stage which consists of individuals that do not intend to start exercising within the next six months. Individuals in this stage may be unsure about their ability to change and may even be defensive because of the growing emphasis by society to live a healthy lifestyle. In addition, individuals in this stage may be unaware of the long-term consequences of being physically inactive. The second stage is the contemplation stage, which is when an individual becomes concerned about their current behavior and is serious about making a change in behavior within the next six months. Many individuals remain in this stage for an extended period of time even up to two years. This indicates that even though the individual is serious about making a change in behavior, action to do so is unlikely. The third stage is the preparation stage, which is when an individual starts to exercise irregularly. Although the individual is exercising a little, it is not consistent enough to make any real behavior changes or see any benefits of working out. However, a plan was developed and the individual is taking action to begin making a change in behavior. Relapse may be evident in this stage but because of the inconsistent exercise behavior, relapse is not often the reason for failure to make a consistent change in behavior. The fourth stage is the action stage, which is when an individual starts to exercise on a regular basis but has been exercising consistently less than six months. This is usually the most unstable stage and has the highest risk of relapse (Wienberg & Gould, 2011). Even though an individual is exercising on a regular basis the threshold of six months has not been reached and it is often observed that

individuals fall back to the preparation stage and even the contemplation stage. Maintenance is the fifth stage, which is when an individual has been exercising consistently for more than six months. According to transtheoretical model, an individual must maintain the consistent exercise routine for five years before the behavior is fully adopted. When the exercise behavior is fully adopted the individual is likely to maintain the same physical activity throughout the lifespan except when injured or other health-related problems occur which prevent the individual from being physically active.

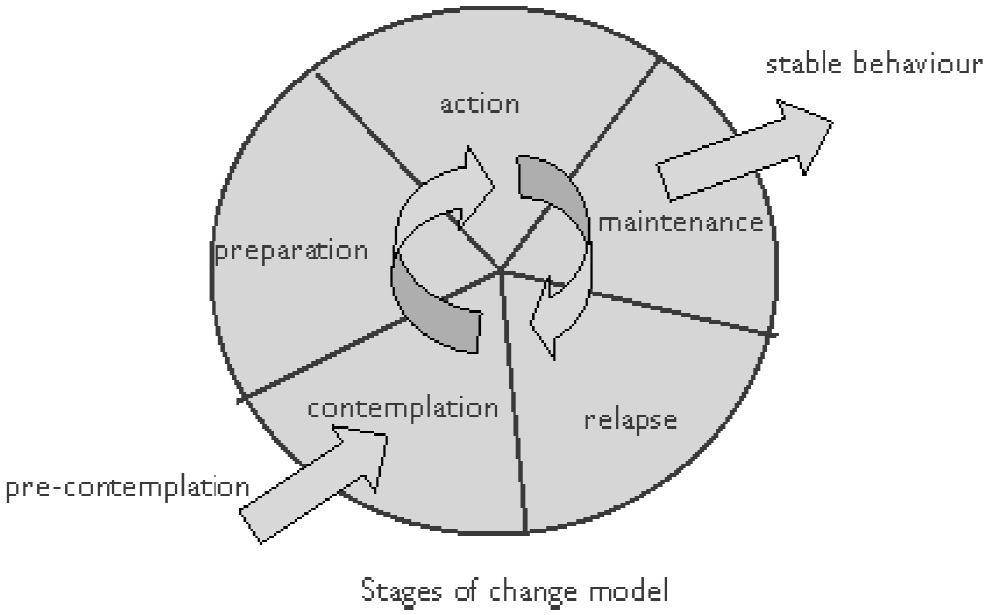

Figure 2. Stages of Change Model (System Concepts, n.d.).

The transtheoretical model has been used by many health professionals when designing treatment program to improve the lifestyle of the population served. When health professionals use the stages of change model it is important to understand which stage an individual is in, in order to match the treatment to the stage. When the treatment strategy is mismatched with the stage of change, relapse is more common. When individuals make decisions about physical activity, they go through a mental cost-

analysis weighing both the pros and the cons of becoming physically active before pursuing that new lifestyle. Research is consistent that the cons seem to outweigh the pros during the pre-contemplation and contemplation stages. However, as an individual progresses to the preparation stage there seems to be an equalization between the pros and cons and eventually the pros outweigh the cons during the active and maintenance stages. Sarkin et al. (2001) indicated that 40% of individuals are in the pre-contemplation stage and 40% are in the contemplation stage when risk behaviors, such as physical inactivity, are the behaviors being changed. Therefore, it is important to educate and motivate individuals during the early stages in order to help people move from the early stages to the preparation, action, and maintenance stages.

The processes involved in the stages of change model are important to understand in order to assist individuals to progress to a new lifestyle and explains why some individuals are unable to adopt a new lifestyle. Both cognitive and behavioral processes are considered throughout the stages of change (Wienberg & Gould, 2011). The cognitive processes involves five processes: consciousness raising, which is increasing awareness of the benefits; dramatic relief, which is an emotional response to understanding the risks of the current lifestyle and the relief that can come from changing; environmental reevaluation, which is when an individual considers the impact of the current lifestyle and the new lifestyle on their social environment; self-reevaluation, which is considering how the lifestyle change can make an individual healthier and happier in society; and social liberation, which is when accessible social avenues to change are identified (Wienberg & Gould, 2011). The first three processes are important in order to help individuals move through the pre-contemplation and

contemplation stages whereas the last two processes are important in the preparation and action stages. As the individual continues to improve his or her self-efficacy, the ability to use the resources available to make a positive change, he or she will be able to make the changes needed to maintain the new lifestyle and eventually have a stable lifestyle. The behavioral processes involve five phases as well, including counter-conditioning, which is when individuals engage in some physical activity instead of remaining inactive; helping relationships, which is when someone is available to support the other when struggling to exercise; reinforcement management, which is when individuals reward themselves for continual physical activity; self-liberation, which is when an individual understands they are in control of their actions; and stimulus control, which is when visual reminders are placed in common areas to remind the individual to participate in physical activity (Wienberg & Gould, 2011).

The transtheoretical model is important to physical activity and wellness through the lifespan because of the stages one must go through to maintain or adopt a healthier lifestyle. This may be important for both high school athletes and non-athletes. High school athletes seem to live an active lifestyle due to continual practices, games, workshops, and camps. However, two situations may occur after graduation. In one situation, the athlete may have developed a lifestyle of physical activity that includes the self-liberation behavioral process and the social liberation cognitive process to remain active throughout adulthood (Wienberg & Gould, 2011). On the other hand, once graduated the athlete may lose the structured physical activity of sports that were provided during the past four or five years. This may be a factor that leads to a relapse in physical activity. Therefore, the once-athlete would start over in one of the lower stages

of change. Depending on the cognitive and behavioral processes available at that time, the once-athlete may be able to quickly move to the action and maintenance stages (Wienberg & Gould, 2011).

However, some may not be able to move into those stages because of the lack of processes available or other life factors that take the place of the structured athletic programs of high school causing a perception and barrier of decreased available time. This second situation may even extend into the middle and late adulthood life stages before preparation and action take place although pre-contemplation and contemplation may be evident for several years. The non-athlete however, may begin moving through the stages of change earlier because of the lack of structured continual sport opportunities in high school. Although some of the cognitive and behavior processes may be less available to make a change in high school, the non-athlete would still have more time to work through the stages. According to this scenario, it may be possible for non-athletes to adopt a healthier lifestyle of physical activity that is sustained when transitioning through adulthood especially if the self-liberation behavior process and the self-reevaluation cognitive process are achieved by late adolescence. This perspective was discovered by Horneffer-Ginter (2008) who evaluated a variety of health behaviors in young adults and found that most young adults in college reported being in the preparation stage for physical activity and exercise which is when self-reevaluation and self-liberation are usually available and begin to occur. However, the study did not consider those that did and did not participate in high school athletics. Therefore, more research on whether high school athletics can help individuals remain in the maintenance stage or even fully adopt a lifestyle of maintained physical activity is needed.

Physical Activity Through the Lifespan

The International Platform on Sport and Development (2011) suggests that competitive athletics encourages life-long participation and supports the need for accessible athletic programs beyond educational institutions that provide a holistic perspective. Public health departments, including recreation departments should expand the focus of sport programs to include the development of the individual and not only the development of skills. When sport programs focus on the individual as well as the broad view of how to play the game, participants become more engaged in continual participation beyond high school.

Telama et al. (1996) examined the stability of physical activity habits at four different intervals starting at age nine and ending at age 30 by administering a survey questionnaire to measure physical activity levels and sport participation at each interval. A simplex model for correlations between physical activity levels at each interval was used. The first and the last interval showed a significant decrease in physical activity patterns. However, there was a positive relationship with the overall stability of physical activity patterns from the first interval to the last interval. The conclusion of the study suggested that many of the participants took a break from physical activity earlier in life and then returned to being physically active later and then returned to inactivity later in life due to life changes.

Barnekow-Bergkvist et al. (1998) conducted a similar longitudinal study by administering a survey to individuals at age 16, which measured physical capacity in regard to specific weight lifting exercises and attitudes towards leisure-time sports. Eighteen years later at age 34, 65% of the sample participated in the follow-up. The

follow-up questionnaire focused on current leisure-time physical activity. At age 16, males were significantly more active in sport participation and fitness clubs than females. However, at age 34 there was not a significant difference between the sexes in terms of physical activity. The study reported that physical tests, height, and weight in adolescence were important factors in determining physical activity later in life. Attitudes and accessibility about sports at a younger age are important factors to consider for facilitating positive physical activity experiences that may help develop physical activity habits later in life. Although the authors discussed that there are many factors, including structured activities that may also determine physical activity. Sports may be a factor that may provide insight into developing physical activity habits.

In another longitudinal study, Picavet, Wendel-vos, Vreeken, Schuit, and Verschuren, (2011) recorded leisure-time physical activity during three specific periods over a 10-year span to measure sustained physical activity. Time spent participating in various activities, including sports, were detailed during each period. The study included over 3,000 adults between 26 and 65 years old. A third of the sample was active at baseline and remained active during each measurement period. Almost a quarter of the sample was inactive at baseline and remained inactive during each measurement period. Seventeen percent that were inactive became active and 14% that were active became inactive. Picavet et al. (2011) concluded that almost 40% of the participants changed their physical activity patterns suggesting that studies that only measure one time are invalid. In addition, further analysis showed 30% that participated in physically active activities remained active. This may be considered low, but only 45% of the participants reported being active at baseline. That means 66% of those that were active remained

active. These results strongly support the need for more physically active opportunities, like sports, earlier in life to help maintain physical activity habits later in life. Horneffer-Ginter (2008) also supports the need for healthy habits to be formed in young adulthood, because as reported the early part of this stage is a period of formative development when healthy habits may be easily shaped and those habits may set the foundation for behaviors and attitudes that are carried through the adult life stages.

Telama et al. (2005) examined data from the Cardiovascular Risk in Young Finns Study (CRYFS). The CRYFS study included more than 2,000 children and adolescents from three years to 18 years old and concluded when the participants were 24 years to 39 years old. A physical activity index was used based on the CRYFS self-reported questionnaire. A high level of physical activity in adolescence was a significant predictor of physical activity later in life. The conclusion indicated that physical activities at younger ages were important in sustaining physical activity levels later in life (Telama et al., 2005). Multiple sports offered in high school could be defined as activities high in physical exertion. Persistent physical activity measured during several consecutive periods would then increase the likelihood of sustained physical activity later in life as well.

Young Adulthood

Young adulthood produces a variety of challenges for individuals to maintain their physical fitness. Young adulthood includes any individual between the ages of 20 and 35 (Barnett & Blanco, 2013). Individuals in this life stage will transition from high school to college and into a professional career. Marriage and family life may also be a factor to consider in this life stage. The transition from high school to college should be a

time that the adolescents transition to adult roles and responsibilities (Tudor-Locke et al., 2007). The college student takes on new views of what is important. Routines that were evident in high school may no longer be habits as students enter the college life. Students that participate in high school athletics begin to have their priorities change and one of the things that changes is the involvement in physical activity. Physical activity seems to decrease with age with the most rapid decrease happening when individuals are in the adolescence and in the early adulthood stages (Stevens et al., 1985). For example, Reed and Phillips (2005) found that freshmen and sophomores engage in three times more physical activity per week than students in their junior and senior years of college. This is evident that the decrease of physical activity in college students decreases over a student's college career. As a whole, the recommended participation in physical activity is not being met by many students on college campuses (Behrens & Dinger, 2003; Dinger, 1999, 2000).

Popkin and Doak (1998) conducted a study on the obesity epidemic and concluded that as adolescents' transition to adulthood physical activity experienced within school hours would be replaced with more sedentary work hours. Obesity in students is predictive of weight status in adulthood (Iwrin, 2007; Whitaker, Wright, Pepe, Seidel, & Dietz, 1997). Physical activity is associated with long-term healthy habits and intervention programs are needed to improve physical activity habits in young adulthood (Irwin, 2007). Awareness of recreational facilities on college campuses may have a positive influence on the physical activity patterns students (Reed, 2007). Behrens and Dinger (2003) suggest that college student's health may improve from an intervention of intramural sports participation. Participation in structured athletics, such as high school

sports, may help students maintain healthy habits that may or may not be carried over into young adulthood. Past studies have focused on physical activity in high school and college, but little research has focused on the transition from adolescence to young adulthood and onto the final two stages of the lifespan.

Buckworth and Nigg, (2004) investigated the association between sedentary behaviors, exercise, and physical activity of college students enrolled in conditioning activity classes. The authors administered a questionnaire to measure the level of sedentary behavior according to the activity. The results indicated older students were more sedentary than younger students were. For men, watching television was not negatively associated with the physical activity. However, computer use was negatively associated with the physical activity. For women the opposite was true. Watching television was negatively associated with physical activity indicators and computer use was not related. A factor utilized in the study was accessibility. This factor related to increased sedentary behavior. The authors recommend health professionals design physical activity interventions that are more accessible and more rewarding than watching television for females and using a computer for males. This recommendation could support the need for more athletic programs. Athletic programs have been cited as very rewarding and are a form of physical activity (Buckwork & Nigg, 2004). The athletic programs may be offered through campus recreation departments and increase the physical activity habits of college students. However, as young adults graduate and move on from college, community services and for-profit organizations offer programs promoting physical activity.

Middle Adulthood

Middle adulthood produces some of the biggest physical changes in life. This life stage includes any individual between the ages of 35 and 55 (Barnett & Blanco, 2013). Many individuals in this life stage are comfortable in their career path and family life. However beyond the career and family, many individuals' physical ability starts to deteriorate (Barnett & Blanco, 2013). Sheehan, Dubrava, DeChello, and Fang (2003) reported that the transition from young adulthood to middle adulthood is when the highest risk of weight gain usually occurs. Therefore, this life stage becomes crucial in maintaining a healthy routine before this stage and after as an individual continues into the next life stage. Lachman (2004) suggested that lifestyle behaviors in youth and young adulthood have an effect on health in middle adulthood and the habits developed or maintained in middle adulthood would affect outcomes in old age. In addition, the risk factors for chronic illness are heightened during this period as health-related behaviors such as exercise and good nutrition decline making it increasingly difficult to be healthy because of chronic conditions an individual may deal with during this stage (Lachman, 2004). Developing a healthy routine needs to start in previous life stages, preferably in adolescence, to continue through middle adulthood. The amount of vigorous physical activity may decline due to physical ability, but moderate physical activity may still be maintained.

Public health organizations have recommended that regular physical activity may minimize weight gain related to specific life stages. This implies that physical activity may prevent weight gain if individuals are able to maintain high levels of physical activity. As reported, the U.S. Department of Health and Human Services (2008)

recommends physical activity to consist of 30 minutes of moderate to strenuous activity 5 days a week to maintain a proper weight specific to age. However, in a recent study Lee, Djousse, Sesso, Wang, and Buring (2010) found that the Department of Health and Humans Services guidelines were insufficient in preventing weight gain for middle-age women. Therefore it seems to be unclear if the federal guidelines for physical activity are sufficient for young adults as they transition through the last two life stages.

Hankinson et al. (2010) investigated this topic to understand if there was a correlation between maintained physical activity and weight gain over a 20-year period. The researchers used the Coronary Artery Risk Development in Young Adults (CARDIA) study for the research population. Young adults starting at the ages of 18 and ending at age 30 were identified from four cities in the United States totaling 3,554 participants. The CARDIA physical activity questionnaire was utilized, which asks participants about their participation in 13 activities known for moderate and strenuous intensity, including areas in sports, occupational activities, and exercise. Each activity was assigned an intensity score and the sum of all the activity scores determined the usual level of physical activity over the previous year. There were seven examinations including the baseline, which were at 2, 5, 7, 10, 15, and 20 years after baseline. At each examination, waist circumference and body mass index were measured. Habitual activity levels considered strenuous, moderate, and mild were defined based on the sex-specific categories. An additional analysis was used based on the recommended physical activity levels of the Department of Health and Human Services. All analyses were stratified by sex and the Spearman partial correlation coefficients were used to evaluate the correlation between physical activity scores and that of waist circumference and body mass index.

Generalized equations estimated the relation of habitual physical activity and annual changes in body mass index over 20 years (Hankinson et al., 2010).

Hankinson et al. (2010) found that 11% of women and 12% of men in the highest activity category were able to maintain the same physical activity over 20 years in the middle adulthood life stage. Although body mass index, when adjusted for age, increased for all habitual activity categories, habitual high physical activity was correlated with smaller increases in body mass index, waist circumference, and weight gain when compared to those in the low physical activity category (Hankinson et al.). In addition, males that maintained high levels of physical activity gained 2.6 fewer kilograms in weight and 3.1 fewer centimeters in waist circumference each year when compared to males in the low physical activity category (Hankinson et al.). Females that maintained high levels of physical activity gained 6.1 fewer kilograms in weight and 3.8 fewer centimeters each year when compared to women in the low physical activity category (Hankinson et al.). Males and females that maintained the Department of Health and Human Services physical activity guidelines also saw smaller annual increases in weight gain and waist circumference. Males gained 1.8 fewer kilograms and females gained 4.7 fewer kilograms in weight gain when compared to participants that did not maintain the Department of Health and Human Services guidelines (Hankinson et al.). Hankinson et al. concluded that "maintenance of higher activity levels over 20 years was associated with smaller gains in BMI among men and women as they transitioned from young adulthood into middle age" (p. 2,607). Women seemed to benefit the most from high physical activity and maintained physical activity. These results support the need for individuals to develop physical activity habits early in life that may be sustained

throughout the life stages, especially during the middle adulthood stage when individuals are at the highest risk of weight gain (Sheehan et al., 2003). Maintained higher levels of physical activity may be necessary to combat the reported health concerns of weight-related diseases and age-related declines in lean body mass and resting metabolic rates that are related to physical inactivity.

Late Adulthood

The final life stage is late adulthood. This stage encompasses any individual 55 years old or older (Barnett & Blanco, 2013). During this life stage, physical abilities continue to deteriorate reflecting an almost complete absence of vigorous physical activity. Furthermore, the ability to participate in moderate physical activity may depend on the habits created in previous life stages or the alteration of activities that promote moderate physical activity. Beck et al. (2010) found that active retirees contributed their physical activity levels to life-long tendencies, or in other words, activities and sports participated in earlier in life. Those that were inactive retirees contributed their inactivity to bad experiences, such as injury and lack of physical activity opportunities earlier or later in life.

The opportunities for physical activity may not be the only factor to consider during this life stage. This life stage may also be influenced by changes in emotional stability. The loss of a spouse, friends, or other relevant individuals has an affect not only on the emotional well-being of individuals but is also related to whether or not an individual has a desire to be physically active (Barnett & Blanco, 2013; Beck et al., 2010). These losses may contribute to lower self-esteem. Godbey (2008) adds that "many individuals who have low self-esteem, there is a tendency to disregard many

important issues of personal health—you don't take care of what isn't thought to be worth very much" (p. 355). Not only does low self-esteem relate to reduced physical activity but a low sense of community or lack of social support may have a negative effect on one's physical activity. Beck et al. (2010) interviewed individuals that averaged over two years of retirement. The focus of the study was physical activity patterns and the factors that contributed to choosing to participate in physical activity in retirement. The results found that social factors, lifelong tendencies, and sense of purpose contributed to whether or not an individual was physically active in retirement (Beck et al., 2010). The social aspect of team sports may allow individuals to feel a sense of purpose. In addition, the continual participation, or lifelong tendencies in participating in sports may also support physical activity in retirement.

When considering overall wellness and quality of life, one must consider the implication physical activity may have on intellectual wellness later in life. This is a related area of concern considering cognitive decline is common among older adults. Jorm and Jolley (1998) reported that at least 10% of individuals in the late adulthood stage and 50% of those in this stage that are older than 85 years old suffered from some type of cognitive disability or impairment with dementia being the worst case.

There have been several studies that focused on the association between physical activity and intellectual wellness but many of them cited multiple limitations making it difficult to come to any real conclusions on the topic (Yaffe, Barnes, Nevitt, Lui, & Covinsky, 2001). Yaffe et al. (2001) considered these limitations and conducted a study of their own on the correlation physical activity had on reducing the decline of cognitive ability in women in the late adulthood stage. The study included 5,925 participants 65

years or older from four different areas in the United States including Baltimore, Minneapolis, Pittsburgh, and Portland. At the beginning of the study, all participants were examined and those with baseline cognitive decline were excluded. A modified mini-Mental State Examination, with a potential range of 0 to 26 with the higher the number the better cognitive stability, was used to determine cognitive function. Physical activity was measured by participants self-reporting how many city blocks they walked each day for exercise and how many stairs they climbed each day (Yaffe et al., 2001). The Paffenbarger Scale (PS) was also used to determine physical activity. The PS utilized trained interviewers to ask participants to report the number of times and length of time spent in physical activity in 33 different activities including various sport participation. Energy expenditure was assigned to each physical activity measured and classified into three groups of low, medium, and high activity similar to mild, moderate, and vigorous grouping respectively. Total physical activity in kilocalories was calculated and placed in four groupings. After recording the baseline measures, the researchers administered a follow-up data collection six to eight years later.

Yaffe et al. (2001) found that 24% of participants in the lowest energy expenditure group developed cognitive impairment compared to 17% of participants in the higher energy expenditure group. The odds of suffering from cognitive decline were 35% lower when participants were in the highest group compared to participants in the lowest group. Furthermore, the authors found that for every 10 blocks walked each day, females lowered their possibility of cognitive decline by 13% (Yaffe et al., 2001). In addition, participants in the highest physical activity group had fewer morbid medical conditions, lower body mass index, less functional limitations, and lower depression

scores all of which are related to physical and emotional wellness. Yaffe et al. (2001) concluded that "moderate, as well as strenuous, physical activity was associated with decreased risk" (pg. 1,707) but suggested "further research is needed to determine if physical activity programs could prevent clinically significant cognitive impairment" (pg. 1,708). Athletic participation, if sustained throughout the lifespan, may be a viable option for individuals to maintain overall wellness. This study supports the need for research on the relationship between athletic participation in adolescence and its effects on overall wellness later in life.

Conclusion

This study will focus on those healthy physical activity habits that were, and were not, formed earlier in life due to athletic participation and non-athletic participation in high school athletic programs. The physical activity habits of adults in the final three stages of the lifespan will be examined by status. Jiang et al. (2007) experimented with an intervention program that showed a significant decrease in the prevalence of obesity later in life, which suggests health problems may be controlled or reduced. Understanding how high school athletics may help develop healthy habits may benefit health professionals in providing interventions for the development of healthy habits to fight obesity and the many other related risks of physical inactivity. By understanding the relationship between past and present physical activity habits, health professionals would have a foundation for providing intervention and prevention programs to help develop healthy habits and improve overall wellness for students in high school and throughout the lifespan. Also, if physical activity in high school athletics carries over into other stages of the lifespan; high school administrators, coaches, and parents might

be persuaded to increase access to high school athletics for more students and perhaps reduce cutting athletes from teams or refrain from reducing the number of teams available in high school. Community recreation professionals might also become involved in providing more athletic programs for adolescents.

Chapter Three: Methodology

Overview

The intent of this study was to examine if participation in high school varsity athletics has a positive effect on physical activity levels and perceived wellness later in life. The study compared physical activity levels and perceived wellness scores of previous high school athletes and non-athletes later in life. The study builds upon existing research and provides a foundation for future prevention, intervention, and research programs for sustaining physical activity and wellness throughout the lifespan. The study procedures were approved by the Study Site University's Institutional Review Board (IRB) (Appendix A) prior to the data collection of the study.

Problem Statement

At the time of this study, there was limited research on the differences between high school varsity athletic participants and non-participants' physical activity levels and perceived wellness throughout the lifespan. Most of the current research on the topic focused on the relationship of high school athletic participation and either late adulthood or young adulthood. It appeared that the middle adulthood population was under-represented and the effort to analyze each life stage in regards to high school athletic participation in the same study was limited. The purpose of this study was to investigate the differences between participants and non-participants of high school varsity athletics physical activity levels and wellness throughout the lifespan in the three adult life stages: young, middle, and late. The research hypotheses tested the idea that participants in high school varsity athletics would be more physically active throughout the lifespan and in the specific life stages when compared to non-athletes. In addition, the study examined if

participants in high school varsity athletics scored higher on perceived social, physical, and emotional wellness when compared to non-athletes throughout the life span and in the specific adult life stages.

Research Questions and Hypotheses

The study was focused on the four research questions below:

1. Does high school athletic participation develop physical activity habits that are sustained throughout the three adult life stages: young, middle, and late?
2. Do individuals that participated in high school athletics have a higher level of physical activity in the three adult life stages when compared to those that did not participate in high school athletics?
3. What are the differences between the physical activity levels by adult life stage?
4. Do individuals that participated in high school athletics have a higher self-reported wellness scores than those that did not participate in high school athletics?

The study had six null hypotheses listed below:

1. High school varsity athletic participants will not report higher rates of moderate-strenuous physical activity through the adult life stages when compared to non-participants.
2. High school varsity athletic participants will not report higher levels of total physical activity than non-participants.

3. High school varsity athletic participants will not report higher physical wellness scores through the adult life stages when compared to non-participants.
4. High school varsity athletic participants will not report higher emotional wellness scores through the adult life stages when compared to non-participants.
5. High school varsity athletic participants will not report higher social wellness scores through the adult life stages when compared to non-participants.
6. High school varsity athletic participants will not report higher total wellness scores through the adult life stages when compared to non-participants.

Participants

Study participants were recruited from the alumni population of Study Site University. Study participants were invited to complete a survey on physical activities the participants engaged in during the past week as well as the participants' self-perceived social, physical, and emotional wellness. There were a total of 773 individuals that participated in the study. Following the collection of survey responses 564 individuals completed all the survey questions. Two hundred and nine participants were excluded from the study due to incomplete survey responses. The population was 66.9% female and 33.1% male, predominately Caucasian (85.8%), and married (63.5%). The number of athletes and non-athletes were similar. Table 1 represents the summary of the participants' characteristics.

Research Setting

The study was conducted by utilizing the Study Site University alumni database to send an e-mail participation request to all alumni.

Table 1

Subject Characteristics for Study Population

Variable	N	% of group
Gender		
Male	170	30.9%
Female	390	69.1%
Marital Status		
Single	144	25.5%
Married	358	63.5%
Widowed	13	2.3%
Divorced	41	7.3%
Seperated	7	1.2%
Other	1	.2%
Ehnicity		
African American	49	8.7%
Caucasion	484	85.8%
Hispanic or latin	26	4.6%
Native American	2	.4%
Asian	2	.4%
Other	1	.3%
Sport Participation		
Varsity Sport Participant	334	59.2%
Non-Varsity Sport Participant	230	40.8%

Table 2 groups the subjects according to high school athletic participation, life stage, and gender. Based on group frequencies, there were more female participants in all groups. There were also more varsity sport participants, except in late adulthood, than non-varsity sport participants in all groups.

Table 2

Subject Characteristic by Life Stage and Gender

Variable	N	% of group
Varsity Sport Participation		
Young Adulthood	175	31%
Male	61	10.8%
Female	114	20.2%
Middle Adulthood	125	22.1%
Male	54	9.5%
Female	71	12.5%
Late Adulthood	33	5.8%
Male	13	2.3%
Female	20	3.5%
Non-Varsity Sport Participation		
Young Adulthood	87	15.4%
Male	21	3.7%
Female	66	11.7%
Middle Adulthood	90	15.9%
Male	20	3.5%
Female	70	12.4%
Late Adulthood	54	9.5%
Male	5	.8%
Female	49	8.6%

Sampling Procedures

Study participants were Study Site University alumni. An informed consent (Appendix B) was required for participation in this voluntary study. All participants were in one of the three adult life stages, therefore, no participant was under the age of 18, which would require parental consent. Study Site alumni were recruited through e-mail notification utilizing the Study Site survey monkey account. Alumni were sent an invitation to complete the survey through e-mail notification seven times, once every two weeks between March 26 and May 27. Survey responses were connected to e-mail accounts, which allowed participants to complete the survey once.

Research Design

This study was of quantitative, cross-sectional design using a non-random convenience sample taken from alumni of Study Site University. A cross-sectional design is often used to survey a predetermined population at one point in time, as in the case of this study, individuals in the young, middle, and late adulthood stage over a few days period (Fraenkel, Wallen, & Huyn, 2012).

All electronic data from the alumni survey was stored on a secure database and only accessed by the primary investigator and committee chair. Participants completed a self-reported electronic survey utilizing the Godin Leisure-Time Exercise Questionnaire that provided a 4-item query regarding the participant's routine and physical activity during a typical seven-day week with regard to strenuous, moderate, and mild exercise. The instrument consisted of a Likert scale reporting the "frequencies of strenuous, moderate, and mild activities multiplied by nine, five, and three, respectively" (Godin, 2011, p. 19) for the first 3-item query. The total weekly physical activity was then calculated to provide the sum of each components and then added together to provide a total score for physical activity. The fourth-item query was used to calculate how many times an individual participated in weekly physical activity that was pursued long enough to cause an individual to sweat.

In addition to the Godin Leisure-Time Exercise Questionnaire, participants also completed the 18 statements from the Perceived Wellness Survey, which focused on social, physical, and emotional wellness. A composite score was calculated using both standard and reverse scoring for each dimension of wellness. The possible ranges for the composite score were from 6 to 18 for each dimension. Demographic questions were

also used to categorize the questionnaires based on age and whether or not the study participant participated in high school varsity athletics. In addition, gender, ethnicity, marital status, and the number of years participated in any structured sports were collected.

Godin Leisure-Time Exercise Questionnaire

The Godin Leisure Time Exercise Questionnaire (Appendix C) was developed by Godin and Shephard (1985). The instrument was developed in Canada in 1985 and first used as an instrument to assess behaviors of physical activity during leisure in the community. The questionnaire consisted of self-reported questions measuring the participant's amount of physical activity with regard to vigorous, moderate, and mild exercise. Questions were added to help categorize the different demographics and independent variables. The instrument was on the public domain; however, Godin was contacted for permission to use the instrument for this study and to verify the effect of the changes with regard to validity. Godin approved the use of the instrument and indicated the changes would not affect the validity of the instrument. The questionnaire was being used for the purpose of measuring and comparing the success of developing habits of physical activity later in life, with regard to participation in varsity athletic programs offered in high school. The Godin Leisure Time Exercise Questionnaire had been used in many studies in Canada, as well as a variety of other countries, and during different seasons to measure types of participants' physical activity patterns (Godin, 2011). Each study verified the instrument's validity and reliability (Ainsworth, Berry, Schnyder, & Vickers, 1992; Godin, Desharnais, Jobin, & Cook, 1987; Godin, & Shephard, 1985; Irwin, 2007; Noreau, Shephard, Simard, Pare, & Pomerleau, 1993).

Perceived Wellness Survey

The Perceived Wellness Survey (Appendix C) was developed by Adams. The instrument was used to assess perceptions of wellness specifically in the areas of physical, psychological, emotional, intellectual, social, and spiritual. The survey consisted of six statements per wellness category for a total of 36 statements. The statements were self-perception phrases such as: "My physical health is excellent," "Members of my family come to me for support," and "I sometimes think I am a worthless individual." Each statement was rated on a scale from 1 to 6, for which 1 represented strongly disagree and 6 represented strongly agree. For the purpose of this study, only the statements for the social, physical, and emotional wellness were used, for a total of 18 statements. The Perceived Wellness Survey was used in many research studies to evaluate perceived wellness (Adams, Bezner, Garner, & Woodruff, 1998). The Perceived Wellness Survey was verified for validity and reliability in each study (Adams, Bezner, Drabbs, Steinhardt, & Zambarano, 2000; Adams et al., 1998; Alameda, 2009; Bezner et al., 1999).

Data Analysis Procedures

Analysis of the data utilized the Statistical Package for the Social Sciences 21.0 (SPSS) to provide descriptive statistics and to evaluate the responses given by the participants on the survey. Each null hypothesis was addressed with a comparison of mean values through use of Analysis of Variance (ANOVA). Based on results of the ANOVA post hoc analysis was applied.

Reliability

A reliability analysis was run on the three dimensions of wellness to ensure internal consistency of responses to the Perceived Wellness Survey. Table 3 summarizes the results of the analyses.

Table 3

Measure of Internal Consistency for Perceived Wellness Subscales

Subscale	# of Items	Alpha Reliability
Physical Wellness	6	.8070
Emotional Wellness	6	.7380
Social Wellness	6	.7140

It was suggested that reliabilities of .60 to .80 were acceptable in the early stages of basic research; therefore, all scales were retained (Churchill, 1979).

Threats to Validity

The following tables provides a summary of the internal and external threats to validity. Kirk (1982) explained that valid inferences refer to generalizations that might be drawn from the effects of an independent variable on a dependent variable that leads to a conclusion. There are two categories of threats to valid inferences for this study, which include internal validity and statistical conclusion validity (Cook & Campbell, 1979). Tables 4 and 5 address internal and statistical conclusion validity by listing the threats to valid inferences and how the inferences were observed and controlled, if possible.

Table 4

Threats to Internal Validity

Threats	Controlled	Explanation
Ambiguous temporal precedence	Yes	Participation in high school varsity athletics was the basis of the study and therefore the cause
Confounding	Partially	The study utilized survey research through a self-report instrument
Selection bias	Yes	Participants were recruited through a third party communication administrator
History	Partially	To the primary investigator's knowledge participants completed the survey without influence from outside events
Maturation	No	Participants were surveyed at only one point in time
Instrumentality	No	Survey scale reliabilities were within acceptable parameters
Regression toward the mean	Yes	Participants were similar in each group
Differential attrition	Partially	Some attrition due to incomplete data on the questionnaire surveys
Selection-maturation interaction	No	Participants self-selected to study
Experimenter bias	Yes	The primary investigator was not aware of any condition of the participants before the study
Compensation	Yes	The population was not provided any compensation for participation

Table 5

Threats to Statistical Conclusion Validity

Threats	Controlled	Explanation
Low Statistical Power	Yes	Samples for each group consisted of >30 subjects
Reliability of Measures	Partially	Reliability analyses were conducted to ensure consistency of items internally
Random Heterogeneity	Partially	There were no significant differences among groups – sample frame contained all college graduates

Summary

This was an exploratory study investigating the differences between high school varsity athletic participation and non-participation physical activity levels and perceived wellness later in life. The primary investigator hypothesized that individuals that participated in high school varsity athletics were more physically active and scored higher on perceived wellness than those that did not participate in high school varsity athletics. In addition, the primary investigator hypothesized that individuals that participated in high school varsity athletics were able to sustain moderate-strenuous physical activity throughout the three adult life stages.

A positive association between physical activity and wellness later in life and participation in high school varsity athletics would support intervention and prevention programs aimed at increasing high school athletic opportunities for more students. At the time of this study, many educational institutions were reducing or eliminating extracurricular physical activity programs due to budget constraints, as well as programs being perceived as a lack of priority (Lee et al., 2007; National Association for Sport and

Physical Education & American Heart Association, 2006). These reductions and eliminations were failing to address the negative long-term health and wellness concerns of adolescents associated with physical inactivity. Overall, the results of this study will add to the physical activity and wellness research needed to support intervention and prevention physical activity programs in the adolescence life stage as well as the adult life stages.

Chapter Four: Results

The purpose of this study was to compare the physical activity levels and perceived wellness of adults based on participation and non-participation in high school varsity athletics. The analysis of data investigated if there were differences in healthy lifestyles throughout the adult life stages between former high school varsity athletic participants and non-participants. The data analysis was based on a sample of 564 individuals who participated in activities to address the research questions. Participants were grouped according to adult life stage and whether or not the individual participated in high school varsity athletics. The level of significance for analysis was set at 0.05.

Data Analysis

Table 6 represents the descriptive statistics for the number of times an individual participated in moderate-vigorous physical activity for 20 minutes over a seven-day period, based upon former high school varsity athletic participation and non-participation by life stage.

The mean for strenuous physical activity for all participants was 1.83 with a range of 12. The mean for moderate physical activity for all participants was 2.33 with a range of 20. An ANOVA was performed to compare moderate-strenuous physical activity between groups to address the research null hypothesis 1) High school varsity athletic participants will not report higher rates of moderate-strenuous physical activity through the adult life stages when compared to non-participants.

Table 6

Descriptive Statistics for Moderate-Vigorous Physical Activity Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.
Strenuous Physical Activity			
Athlete Young Adult	2.55	175	2.11
Athlete Middle Adult	1.89	123	2.13
Athlete Late Adult	1.00	33	1.87
Non-Athlete Young Adult	1.70	87	2.30
Non-Athlete Middle Adult	1.47	90	1.96
Non-Athlete Late Adult	.76	54	1.81
Moderate Physical Activity			
Athlete Young Adult	2.39	175	1.85
Athlete Middle Adult	2.16	125	2.16
Athlete Late Adult	3.79	33	3.67
Non-Athlete Young Adult	2.26	87	2.37
Non-Athlete Middle Adult	2.11	90	2.69
Non-Athlete Late Adult	2.34	54	2.47

The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 7. The Null Hypothesis for each category was rejected. .

Table 7

ANOVA for Moderate-Vigorous Physical Activity Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	*F*	Sig.
Strenuous Physical Activity					
Between Groups	188.07	5	37.61	8.66	.000***
Within Groups	2422.43	558	4.34		
Total	2610.50	563			
Moderate Physical Activity					
Between Groups	79.86	5	15.97	2.91	.013*
Within Groups	3058.46	558	5.48		
Total	3138.32	563			

Note. *p < .05; **p < .01; ***p < .001

There was a statistically significant ($p<.001$) difference between groups in strenuous physical activity (F-Statistic = 8.66; F-critical = 3.55; $p = 0.000$; $\alpha = 0.001$). There was also a significant ($p<.05$) difference between groups in moderate physical activity (F-Statistic = 2.91; F- critical = 2.29; $p = 0.013$; $\alpha = 0.05$). Based on the significant ANOVA results, Post Hoc analyses were performed. The results are displayed in Table 8.

Table 8

Post Hoc Analysis for Moderate-Vigorous Physical Activity Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Strenuous Physical Activity			
	Athlete Young Adult	Athlete Middle Adult	.008**
	Athlete Young Adult	Athlete Late Adult	.000***
	Athlete Young Adult	Non-Athlete Young Adult	.002**
	Athlete Young Adult	Non-Athlete Middle Adult	.000***
	Athlete Young Adult	Non-Athlete Late Adult	.000***
	Athlete Middle Adult	Athlete Late Adult	.029*
	Athlete Middle Adult	Non-Athlete Late Adult	.001**
	Non-Athlete Young Adult	Non-Athlete Late Adult	.009**
	Non-Athlete Middle Adult	Non-Athlete Late Adult	.049*
Moderate Physical Activity			
	Athlete Young Adult	Athlete Late Adult	.002**
	Athlete Middle Adult	Athlete Late Adult	.000***
	Athlete Late Adult	Non-Athlete Young Adult	.002**
	Athlete Late Adult	Non-Athlete Middle Adult	.000***
	Athlete Late Adult	Non-Athlete Late Adult	.002**

Note. *p < .05; **p < .01; ***p < .001

There was a statistically significant ($p<.001$) difference in strenuous physical activity means between athletes in young adulthood (mean of 2.55) and athletes in late adulthood (mean of 1.00), non-athletes in middle adulthood (mean of 1.89), and non-

athletes in late adulthood (mean of .76). There was a significant ($p<.01$) difference in strenuous physical activity means between athletes in young adulthood (mean of 2.55) and both athletes in middle adulthood (mean of 1.89) and non-athletes in young adulthood (mean of 1.70). There was a significant ($p<.01$) difference in strenuous physical activity means between athletes in middle adulthood (mean of 1.89) and non-athletes in late adulthood (mean of .76), and between non-athletes in young adulthood (mean of 1.70) and non-athletes in late adulthood (mean of .76). There was a significant ($p<.05$) difference in strenuous physical activity means between athletes in middle adulthood (mean of 1.89) and athletes in late adulthood (mean of 1.00), and between non-athletes in middle adulthood (mean of 1.47) and non-athletes in late adulthood (mean of .76).

There was a statistically significant ($p<.001$) difference in moderate physical activity means between athletes in middle adulthood (mean of 2.16) and athletes in late adulthood (mean of 3.79), and between athletes in late adulthood (mean of 3.79) and non-athletes in middle adulthood (mean of 2.11). There was a significant ($p<.01$) difference in moderate physical activity means between athletes in young adulthood (mean of 2.39) and athletes in late adulthood (mean of 3.79), and between athletes in late adulthood (mean of 3.79) and both non-athletes in young adulthood (mean of 2.26) and non-athletes in late adulthood (mean of 2.34). Based upon the results, data provided evidence to support that differences exist between moderate-strenuous physical activity levels later in life based on former high school varsity athletic participation and non-participation.

Table 9 presents the descriptive statistics for the total number of times an individual participated in any physical activity (strenuous, moderate, and mild) for 20

minutes over a seven-day period based upon high school varsity athletic participation and non-participation by life stage.

Table 9

Descriptive Statistics for Total Physical Activity Based on High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.	Min.	Max
Total Physical Activity					
Athlete Young Adult	8.01	175	4.79	0	21
Athlete Middle Adult	6.77	125	5.20	0	34
Athlete Late Adult	7.39	33	5.04	0	20
Total Physical Activity					
Non-Athlete Young Adult	7.26	87	5.21	0	25
Non-Athlete Middle Adult	6.03	90	5.76	0	37
Non-Athlete Late Adult	6.04	54	4.52	0	16

An ANOVA was performed to compare total physical activity between groups to address the research null hypothesis 2) High school varsity athletic participants will not report higher levels of total physical activity than non-participants. The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 10.

Table 10

ANOVA for Total Physical Activity Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	*F*	Sig.
Total Physical Activity					
Between Groups	328.16	5	65.63	2.52	.029*
Within Groups	14538.59	558	26.06		
Total	14866.75	563			

Note. *p < .05; **p < .01; ***p < .001

The Null Hypothesis was rejected. There was a statistically significant (p<.05) difference between groups in total physical activity (*F*-Statistic = 2.52; *F*-critical = 2.29;

$p = 0.029$; $\alpha = 0.05$). Based on the significance of the results of the ANOVA, Post Hoc analyses were performed. The results are displayed in Table 11.

Table 11

Post Hoc Analysis for Total Physical Activity Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Total Physical Activity			
	Athlete Young Adult	Athlete Middle Adult	.038*
	Athlete Young Adult	Non-Athlete Middle Adult	.003**
	Athlete Young Adult	Non-Athlete Late Adult	.013*

Note. *p < .05; **p < .01; ***p < .001

There was a statistical significant ($p<.01$) difference in total physical activity means between athletes in young adulthood (mean of 8.01) and non-athletes in middle adulthood (mean of 6.03). There was also a significant ($p<.05$) difference between athletes in young adulthood (mean of 8.01) and both athletes in middle adulthood (mean of 6.77) and non-athletes in late adulthood (mean of 6.04). Data provides evidence to support there is a difference in total physical activity between individuals that participated high school athletics and individuals that did not participate in high school athletics.

Table 12 presents the descriptive statistics for perceived physical wellness based upon high school varsity sport participation and non-participation by life stage. The perceived physical wellness score is based on a six-question survey utilizing a 5-point Likert scale with the lowest possible score being a 6 and the highest possible score being a 30.

Table 12

Descriptive Statistics for Perceived Physical Wellness Based on High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.	Min.	Max
Physical Wellness					
Athlete Young Adult	23.60	175	4.51	8	30
Athlete Middle Adult	22.61	125	4.38	8	30
Athlete Late Adult	22.15	33	4.25	10	30
Non-Athlete Young Adult	21.54	87	4.25	13	30
Non-Athlete Middle Adult	21.77	90	5.28	7	30
Non-Athlete Late Adult	22.51	54	5.14	10	30

An ANOVA was performed to compare perceived physical wellness between groups to address the research null hypothesis 3) High school varsity athletic participants will not report higher physical wellness scores through the adult life stages when compared to non-participants. The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 13.

Table 13.

ANOVA for Perceived Physical Wellness Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	*F*	Sig.
Physical Wellness					
Between Groups	372.41	5	74.48	3.48	.004*
Within Groups	11930.50	558	21.38		
Total	12302.91	563			

Note. *p < .05; **p < .01; ***p < .001

The Null Hypothesis was rejected. There was a statistically significant ($p<.05$) difference between groups in perceived physical wellness (F-Statistic = 3.48; F-critical = 2.29; $p = 0.05$; $\alpha=0.05$). Based on the significance of the results of the ANOVA, Post Hoc analysis was performed. The results are displayed in Table 14.

Table 14

Post Hoc Analysis for Perceived Physical Wellness Based Upon High School Varsity Sport Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Physical Wellness			
	Athlete Young Adult	Non-Athlete Young Adult	.001**
	Athlete Young Adult	Non-Athlete Middle Adult	.002**
	Athlete Young Adult	Non-Athlete Late Adult	.013*

Note. *p < .05; **p < .01; ***p < .001

There was a statistically significant (p<.01) difference in perceived physical wellness means between athletes in young adulthood (mean of 23.60) and both non-athletes in young adulthood (mean of 21.54) and middle adulthood (mean of 21.77). There was also a significant (p<.05) difference in perceived physical wellness between athletes in young adulthood and non-athletes in late adulthood. Based on the results, data provided evidence to support differences in perceived physical wellness later in life between high school varsity athletic participation and non-participation.

Table 15 represents the descriptive statistics for perceived emotional wellness based upon high school varsity sport participation and non-participation by life stage. The perceived emotional wellness score is based on a six-question survey utilizing a 5-point Likert scale with the lowest possible score being a 6 and the highest possible score being a 30.

Table 15

Descriptive Statistics for Perceived Emotional Wellness Based on High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.	Min.	Max
Emotional Wellness					
Athlete Young Adult	24.05	175	4.02	11	30
Athlete Middle Adult	24.21	125	3.87	13	30
Athlete Late Adult	25.06	33	3.90	10	30
Non-Athlete Young Adult	22.06	87	3.99	14	30
Non-Athlete Middle Adult	23.74	90	4.31	10	30
Non-Athlete Late Adult	23.76	54	4.67	12	30

An ANOVA was performed to compare perceived emotional wellness between groups to address the research hypothesis 4) High school varsity athletic participants will not report higher emotional wellness scores through the adult life stages when compared to non-participants. The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 16.

Table 16

ANOVA for Perceived Emotional Wellness Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	F	Sig.
Emotional Wellness					
Between Groups	347.97	5	69.59	4.16	.001**
Within Groups	9338.71	558	16.74		
Total	9686.69	563			

Note. *p < .05; **p < .01; ***p < .001

The Null Hypothesis was rejected. There was a statistically significant ($p<.01$) difference between groups in perceived emotional wellness (F-Statistic = 4.16; F-critical = 3.55; $p = 0.001$; $\alpha=0.05$). Based on the significance of the results of the ANOVA, Post Hoc analyses were performed. The results are displayed in Table 17.

Table 17

Post Hoc Analysis for Perceived Emotional Wellness Based Upon High School Varsity Sport Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Emotional Wellness			
	Athlete Young Adult	Non-Athlete Young Adult	.000***
	Athlete Middle Adult	Non-Athlete Young Adult	.000***
	Athlete Late Adult	Non-Athlete Young Adult	.000***
	Non-Athlete Young Adult	Non-Athlete Middle Adult	.006**
	Non-Athlete Young Adult	Non-Athlete Late Adult	.017*

Note. *p < .05; **p < .01; ***p < .001

There was a statistically significant (p<.001) difference in perceived emotional wellness means between athletes in young (mean of 24.05), middle (mean of 24.21), and late adulthood (mean of 25.06) when compared to non-athletes in young adulthood (mean of 22.06). There was also a significant (p<.01) difference in perceived emotional wellness between non-athletes in young adulthood (mean of 22.06) and non-athletes in middle adulthood (mean of 23.74). In addition, there was a significant (p<.05) difference in perceived emotional wellness between non-athletes in young adulthood (mean of 22.06) and non-athletes in late adulthood (mean of 23.76). Based on the results, data provided evidence to support there are differences in perceived emotional wellness later in life between high school varsity athletic participation and non-participation.

Table 18 represents the descriptive statistics for perceived social wellness based upon high school varsity sport participation and non-participation by life stage. The perceived social wellness score is based on a six-question survey utilizing a 5-point Likert scale with the lowest possible score being a 6 and the highest possible score being a 30.

Table 18

Descriptive Statistics for Perceived Social Wellness Based on High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.	Min.	Max
Social Wellness					
Athlete Young Adult	25.47	175	3.73	15	30
Athlete Middle Adult	24.28	125	4.05	13	30
Athlete Late Adult	24.97	33	4.38	14	30
Non-Athlete Young Adult	24.55	87	3.74	10	30
Non-Athlete Middle Adult	24.07	90	4.31	9	30
Non-Athlete Late Adult	23.94	54	4.35	12	30

An ANOVA was performed to compare perceived social wellness between groups to address the research hypothesis 5) High school varsity athletic participants will not report higher social wellness scores through the adult life stages when compared to non-participants. The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 19.

Table 19

ANOVA for Perceived Social Wellness Based Upon High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	*F*	Sig.
Social Wellness					
Between Groups	197.58	5	39.52	2.47	.032*
Within Groups	8929.76	558	16.00		
Total	9127.33	563			

Note. *p < .05; **p < .01; ***p < .001

The Null Hypothesis was rejected. There was a statistically significant ($p<.05$) difference between groups in perceived social wellness (F-Statistic = 2.47; F-critical = 2.29; $p = 0.032$; $\alpha=0.05$). Based on the significance of the results of the ANOVA, Post Hoc analyses were performed. The results are displayed in Table 20.

Table 20

Post Hoc Analysis for Perceived Social Wellness Based Upon High School Varsity Sport Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Social Wellness			
	Athlete Young Adult	Athlete Middle Adult	.011*
	Athlete Young Adult	Non-Athlete Middle Adult	.007**
	Athlete Young Adult	Non-Athlete Late Adult	.014*

Note. *p < .05; **p < .01; ***p < .001

There was a statistical significant (p<.01) difference in perceived social wellness means between athletes in young adulthood (mean of 25.47) and non-athletes in middle adulthood (mean of 24.07). There was also a significant (p<.05) difference in perceived social wellness between athletes in young adulthood (mean of 25.47) and both athletes in middle adulthood (mean of 24.28) and non-athletes in late adulthood (mean of 23.94). Based on the results, data provided evidence to support there are differences in perceived social wellness later in life between high school varsity athletic participation and non-participation.

Table 21 represents the descriptive statistics for total wellness (physical, emotional, and social) based upon high school varsity sport participation and non-participation by life stage.

An ANOVA was performed to compare total physical activity between groups to address the research hypothesis 6) High school varsity athletic participants will not report higher total wellness scores through the adult life stages when compared to non-participants. The Null Hypothesis specific to the ANOVA analysis was: At least one mean is different from the others. The results are displayed in Table 22.

Table 21

Descriptive Statistics for Total Perceived Wellness Based on High School Varsity Sport Participation and Non-Participation by Life Stage

Variable	Mean	N	Std. Dev.	Min.	Max
Total Wellness					
Athlete Young Adult	73.13	175	9.64	40	90
Athlete Middle Adult	71.09	125	9.59	45	88
Athlete Late Adult	72.18	33	9.84	34	90
Non-Athlete Young Adult	68.15	87	9.68	39	86
Non-Athlete Middle Adult	69.58	90	11.13	30	88
Non-Athlete Late Adult	69.50	54	11.34	45	90

Table 22

ANOVA for Total Perceived Wellness Based Upon High School Varsity Sport Participation by Life Stage

Variable	Sum of Squares	df	Mean Square	*F*	Sig.
Social Wellness					
Between Groups	1846.45	5	369.30	3.64	.003**
Within Groups	56569.50	558	101.38		
Total	58415.95	563			

Note. *p < .05; **p < .01; ***p < .001

The Null Hypothesis was rejected. There was a statistically significant (p<.01) difference between groups in total perceived wellness (physical, emotional, social) (*F*-statistic = 3.64; *F*-critical = 3.55; p = 0.003; α = 0.05). Based on the significance of the ANOVA, Post Hoc analyses were performed. The results are displayed in Table 23.

Table 23

Post Hoc Analysis for Total Perceived Wellness Based Upon High School Varsity Sport Participation by Life Stage

Dependent Variable	Group 1	Group 2	Sig.
Total Wellness			
	Athlete Young Adult	Non-Athlete Young Adult	.000***
	Athlete Young Adult	Non-Athlete Middle Adult	.007**
	Athlete Young Adult	Non-Athlete Late Adult	.021*
	Athlete Middle Adult	Non-Athlete Middle Adult	.037*
	Athlete Late Adult	Non-Athlete Young Adult	.050*

Note. *p < .05; **p < .01; ***p < .001

There was a statistically significant (p<.001) difference in perceived total perceived wellness means between athletes in young adulthood (mean of 73.13) and non-athletes in young adulthood (mean of 68.15). There was also a significant (p<.01) difference in total perceived wellness between athletes in young adulthood (mean of 73.13) and non-athletes in middle adulthood (mean of 69.58). In addition, there is a significant (p<.05) difference in total wellness between athletes in young adulthood (mean of 73.13) and non-athletes in late adulthood (mean of 69.50); between athletes in middle adulthood (mean of 71.09) and non-athletes in middle adulthood (mean of 69.58); and between athletes in late adulthood (mean of 72.18) and non-athletes in young adulthood (mean of 68.15). Based on the results, data provided evidence that there are differences in total perceived wellness later in life between high school varsity athletic participation and non-participation.

Summary

The analyses indicated several statistically significant findings in support of a connection between high school varsity athletic participation and physical activity and

perceived wellness later in life. Chapter Five will examine the results further and discuss practical implications and rationales. In addition, the chapter will discuss contributions of this study to the research on physical activity and wellness throughout the lifespan and propose implications and future research from the results.

Chapter Five: Discussion

This study examined the physical activity levels and perceived wellness of individuals in the three adult life stages based on former participation and non-participation in high school athletics. The purpose of this study was to determine if there were differences in physical activity and wellness perceptions later in life between former high school varsity athletic participation and non-participation. The results of the study may provide insight for future researchers in the field of leisure, health, and sport behaviors. Specifically, this study contributes to the literature on physical activity, health, and wellness and life-stage development. The following discussion will review the results of the study, limitations of the study, implications and recommendations for professionals in physical activity and wellness fields.

Results and Implications

Hypothesis 1, High school varsity athletic participants report higher rates of moderate-strenuous physical activity through the adult life stages when compared to non-participants, was tested by analyzing the self-reported data of moderate-to-strenuous physical activity occurrence during a seven-day period in each adult life stage (young, middle, and late adulthood). A comparative analysis of the data was examined based on former participation and non-participation in high school varsity athletics. The level of significance for the study was set at .05. There was data evidence to support Hypothesis 1. These findings suggested that participation in high school varsity athletics can be a factor in determining physical activity in the adult life stages.

Individuals that participated in high school varsity athletics indicated a continuation of strenuous physical activity into young adulthood and were significantly

($p<.01$) more active than all groups, including both athletes and non-athletes (Table 8). This suggests that high school varsity athletics may have been a valuable tool in developing habits of healthy lifestyles as adolescents transition into adulthood. To highlight the differences further, young adults that participated in high school varsity athletics were significantly ($p<.01$) more physically active than young adults who did not participate in high school athletics (Tables 6 & 8). Therefore, it is reasonable to conclude that high school varsity athletics were a good avenue to consider improving physical activity later in adulthood. School administrators should consider allocating more resources or refrain from cutting resources to school-sponsored sports. In addition, schools should consider adding additional school sponsored sport teams to improve students' health in high school and later in life, beyond the offerings to elite athletes who make the varsity squad.

These findings also suggest that the more time individuals participate in sports activities during young adulthood the better chance there will be an improvement in physical activity levels during that life stage. These findings support Behrens and Dinger's (2003) suggestion that more sport opportunities are needed in college populations to increase physical activity. Therefore, it is important for health professionals to consider offering more sport activities to improve physical activity levels in, not only adolescence, but also in young adulthood.

This study found there were significant differences in strenuous physical activity in middle adults when compared to individuals in late adulthood (Table 8). These findings suggest that, as individuals age, the level of strenuous physical activity declines and strenuous physical activity levels become more similar for all groups. As noted,

middle adulthood is the life stage when continual changes occur, which may include job responsibilities, marriage, family, and social relationships. These changes may have an impact in the decline of strenuous physical activity through the life stage leading into late adulthood. There could also be a link to the decline in physical capabilities that occur later in the middle adulthood stage and continue into late adulthood, which may make strenuous physical activity more difficult.

When analyzing the moderate physical activity levels of groups, there were significant ($p<.01$) differences between individuals in late adulthood who participated in high school varsity athletics and all other groups (Tables 6 & 8). This may suggest that past high school athletes in late adulthood were able to become engaged in physical activity once again because of their exposure to sports during adolescence. This supported the findings of Beck et al. (2010) who found individuals in late adulthood contributed re-engagement in physical activities to activities, such as sports participation in earlier in life. In addition, these findings were similar to Telama et al. (1996) who noticed a decrease in physical activity during middle adulthood that would later increase as individuals transitioned into late adulthood. Therefore, exposure to early structured sport opportunities, such as high school athletics, may play a pivotal role in engaging individuals in physical activity later in life.

Hypothesis 2, High school varsity athletic participants report higher levels of total physical activity than non-participants, was tested by analyzing the self-reported data of total (strenuous, moderate, and mild) physical activity occurrence during a seven-day period in each adult life stage. A comparative analysis of the data was examined based on former participation and non-participation in high school varsity athletics. The level

of significance was set at .05. There was data evidence to support Hypothesis 2. However, based on the Post Hoc analysis the differences were not between athletes and non-athletes in the same life stage but between life stages (Table 11). Young adults who participated in athletics also participated in more physical activity than the other groups in later adult stages (Tables 9 & 11). This suggested that physical activity declines as an individual ages and that total physical activity is similar between former athletes and non-athletes in the same life stages. Based on the results (Table 9), it seemed that perhaps some participants did not understand the question correctly, and therefore self-report scores of activity may have been inflated. However, the reported significant ($p<.05$) differences demonstrate that former participation in high school athletics did effect total physical activity in young adulthood (Table 11). Young adulthood was the only group with differences in the total number of times an individual participated in some type of physical activity.

Hypothesis 3, High school varsity athletic participants report higher physical wellness scores through the adult life stages when compared to non-participants, was tested by analyzing the self-reported data on perceived physical wellness with a comparative analysis between former participants and non-participants in high school varsity athletics. The level of significance was set at .05. There was data evidence to support Hypothesis 3. The significant differences ($p<.05$) between individuals who participated in high school athletics and individuals who did not participate in high school athletics in all three life stages suggested a support of high school athletics positively affecting perceived physical wellness in young adulthood (Tables 12 & 14). The results demonstrated the importance of opportunities for students in high school to

participate in structured sports to develop the necessary skills and abilities to remain active later in life, thus improving perceived physical wellness.

These findings also suggested that physical wellness, which is often interpreted as physical fitness, declines for former high school athletes in middle and late adulthood, resulting in similar wellness scores to those that did not participate in high school athletics. Further research is needed to understand why perceived physical wellness was not maintained in later adult life stages or if there was some phenomenon in the lives of non-athletes in the later adult life stages that improved physical wellness scores to the point at which they were similar to scores of athletes. Interestingly, the mean scores of athletes gradually declined over the life stages, whereas the mean scores of non-athletes actually rose over each life stage to the point that non-athletes in late adulthood had a higher mean score than athletes in late adulthood (Table 12). This could mean that as athletes grew older, they were unable to maintain a positive perception of physical wellness due to long term negative effects of sport participation, such as injuries in previous life stages. This theory supports the findings of Beck et al. (2010), who indicated earlier injuries in sports as a reason for late adulthood decline in physical activity levels. There should be consideration for the long-term effects of sport participation on the body, both positive and negative. However, further research is needed to explore the relationship between sport injuries and physical wellness in late adulthood.

Hypothesis 4, High school varsity athletic participants report higher emotional wellness scores through the adult life stages when compared to non-participants, was tested by analyzing the self-reported data on perceived emotional wellness with a

comparative analysis between former participants and non-participants in high school varsity athletics. The level of significance was set at .05. There was data evidence to support Hypothesis 4. The athletes in all three adult life stages had a significant ($p<.001$) differences in mean scores than non-athletes in young adulthood (Tables 15 & 17). This indicated that sport participation in high school can be a strong predictor of perceived emotional wellness in adulthood. This is particularly important for non-athletes in adolescence and young adulthood.

Although mean scores of perceived emotional wellness increased in each stage as individuals grew older (Table 15), the significant differences in emotional wellness in young adulthood could be a concern. This is further highlighted by the results that indicated a significant difference ($p<.05$) between means scores of non-athletes in middle and late adulthood and non-athletes in young adulthood (Table 17). As noted by Allen (2005), adolescence is when an individual develops a sense of self and personal identity or in other words emotional strength. As adolescents transition into adulthood, there are additional changes in life that may include moving away from home, going to college, starting a career, or even starting a family. Emotional wellness is an important factor for a successful transition into these new roles in society. These results link sport participation in high school to higher perceived emotional wellness in adulthood. Therefore, school administrators and health professionals should consider implementing opportunities for more youth to participate in structured sports to help develop a stronger sense of emotional wellness that could be carried into adulthood.

It should also be noted that perceived emotional wellness scores improved throughout each life stage in both athletes and non-athletes (Table 15). This may indicate

that general life experiences improve emotional wellness as an individual grows older. However, participation in high school sports seems to allow individuals to start with a higher wellness score in adulthood that continues to improve and remains higher than non-athletes throughout the lifespan, although not significant (Table 15).

Hypothesis 5, High school varsity athletic participants report higher social wellness scores through the adult life stages when compared to non-participants, was tested by analyzing the self-reported data on perceived social wellness with a comparative analysis between participants and non-participants in high school varsity athletics. The level of significance was set at .05. There was data evidence to support Hypothesis 5. Young adults that participated in high school athletics reported significantly higher scores than athletes and non-athletes in middle adulthood (Tables 18 & 20). This was not surprising considering the characteristics of middle adulthood. Individuals in middle adulthood often turn inward for social relationships with a significant other, family, and possibly children. Social context outside of close kinship is not as common as it is in young adulthood (Barnett & Blanco, 2013). In addition, middle adulthood is also a time when empty nest syndrome may occur, resulting in a decrease in social relationships (Barnett & Blanco, 2013) that may cause a decrease in social wellness.

On the other hand, the young adulthood stage is characterized by social contexts in which individuals engage in work and leisure activities with multiple people (Barnett & Blanco, 2013). As young adults enter college, social relationships are immediately established, with some friendships lasting throughout the lifespan. As the young adult transitions into a career, networking becomes an important factor in securing a job, as

well as in career advancement. In both of these contexts dating is common, which may lead to additional social relationships. These characteristics may give reason for the higher social wellness score in young adulthood. For these reasons it was not surprising to find no significant difference between perceived social wellbeing in athletes and non-athletes in young adulthood.

These findings may support the thought that working with members of a team establishes social skills in adolescence. These findings also seemed to indicate that participation in high school sports may be a factor in developing social skills that are extended beyond adolescence and into young adulthood, and possibly middle adulthood. Therefore, consideration to increased opportunity to participate on high school athletic teams for more students should be considered by school administrators. In addition, leisure professionals should strive to offer more team sport leagues and tournaments for adolescents because of the potential impact on the ability to develop and maintain social relationships later in life.

Hypothesis 6, High school varsity athletic participants report higher total wellness scores through the adult life stages when compared to non-participants, was tested by analyzing the self-reported data on total perceived wellness (physical, emotional, social) with a comparative analysis between participants and non-participants in high school varsity athletics. The level of significance was set at .05. There was data evidence to support Hypothesis 6. Individuals in young and middle adulthood who participated in high school athletics reported significantly higher perceived total wellness scores than non-athletes in the same life stages (Tables 21 & 23). Athletes in young adulthood also reported higher wellness scores than non-athletes in all three adult life stages (Table 23).

These results indicated that total perceived wellness could be a result of former participation in high school athletics because of the strong focus high school athletics has on physical activity and overall wellness for improved citizenship in society.

Although there was not a significant difference between middle adulthood groups when the wellness categories were separated, once combined athletes in middle adulthood reported significantly ($p<.05$) higher total wellness scores (Table 23). This may indicate that participation in sports provided a structured environment to develop the whole person in terms of wellness, which could be carried into middle adulthood. It should also be noted that all significant differences were between former athletes and non-athletes in various life stages (Table 23). This insight also supported the connection that participation in high school sports has with total wellness through the adult life stages.

Limitations

This study provided a quantitative, exploratory design for data collection and analysis, however in any study there are limitations that should be addressed. First, the study was limited to physical activity and wellness information gathered from college alumni. College graduates are more likely to be physically active compared to individuals with lower education attainment or no education at all (Trends in Higher Education, 2008). Therefore, the results of the study may not be generalized to the general population. However, for an exploratory study, the population used was appropriate to build a foundation for future research on physical activity in adulthood.

Secondly, the data collected was based on self-reported information. This may result in margin of error in the report of actual physical activity. However, the research

population was primarily female (69.1%). Self-reported activity is often more reliable and stronger in women than men, who are more likely to over report activity (Ball, Owen, Salmon, Bauman, Gore, 2001).

Thirdly, data collection was based on electronic questionnaire surveys through e-mail communication. Although there was a large population that completed the surveys online, when compared to the number of alumni from the university the response rate was very low. Therefore, the results of the study may not be the best indication of physical activity and perceived wellness in the general population, or even among college graduates. The limitations of the study were minimized as much as possible within the control of the primary investigator. Future research on the topic of physical activity and wellness in adulthood should consider these limitations.

Recommendations for Future Research

As physical activity levels continue to decline and obesity continues to rise, these trends should remain a focus for education administrators, health professionals, and recreation professionals. Possible programs can be utilized as prevention, and interventions tools that produce positive results should be explored. The research to support physical activity and wellness programs is imperative to contribute to improvement of the overall health of society. The intent of this study was to investigate if high school athletic programs were a viable resource to improve physical activity and wellness later in adulthood. The results of this study offer valuable information to school administrators and other professionals working in sport related fields to the importance of participation in sports during high school. Specifically, the significant difference in physical activity and wellness shortly after high school graduation in young adulthood

should provide evidence to support more opportunities for larger numbers of adolescents for participation in sport programs. In light of the findings of the current study, future research on sport choice should be explored to determine which sports in high school are producing the greatest effect of maintained physical activity and wellness later in life. This future research would also lend support to recommendations from Renfrow et al. (2011) on exploring how sport choice is related to physical fitness.

There was strong evidence that high school varsity athletics had a positive effect on healthy lifestyles in young adulthood, but moderate-strenuous physical activity and perceived physical wellness seemed to decline in the latter two life stages. Further research is needed to understand how the decline in moderate-strenuous physical activity and perceived physical wellness can be slowed or even maintained from young adulthood into the later life stages. The Transtheoretical model (System Concepts, n.d.) stage of change may explain that past high school athletes have relapsed to the contemplation or preparation stages. If a relapse is evident, research on effective programs to re-engage individuals in middle and late adulthood to become active again would be needed, and would be beneficial for possibly improving health in adulthood. However, further research is needed to determine if this is the case.

Although athletes in young adulthood were able to continue strenuous physical activity after high school, this study did not explore the resources available that contributed to continued physical activity and whether or not those who did not participate in high school athletics had the same available resources. Because the population was college graduates, it seemed safe to assume that individuals in the early stage of young adulthood had access to the same extracurricular activities open to all

students at a college, such as intramurals and physical activity classes. However, there may be other factors that contribute to non-athletes not participating in those opportunities. Further research is needed on the subject that could be beneficial for college staff members in charge of these opportunities to increase participation. However, after college graduation research is needed to determine the resources available to young adults who participated in high school athletics and whether or not those same resources were available to young adults who did not participate in high school athletics. In both scenarios, if appropriate resources were not known or accessible to everyone, leisure education may be a tool to consider for intervention programs. Caldwell, Baldwin, Walls, and Smith (2004) explained that leisure education is a process of education that helps individuals learn how to use free time appropriately, where to access available resources for involvement in leisure activities, and how to socially interact with others during leisure. The additional research could also support Buckworth and Nigg's (2004) research on the need for more accessible physical activity opportunities for improved physical activity levels in young adulthood.

Conclusion

This dissertation study provides valuable research to the growing body of knowledge on physical activity, sports, and wellness across the lifespan. There is strong support from the results that participation in high school athletics can help individuals develop healthy habits of physical activity and wellness that are carried into the adult life stages. Analysis of the young adulthood stage provided the strongest findings. Specifically, individuals who participated in high school athletics were significantly more active in strenuous physical activity ($p<.01$) and reported a significantly higher total

wellness (physical, social, emotional) score ($p<.001$) than individuals in young adulthood who did not participate in high school athletics. Opportunities to participate in high school sponsored athletic programs should be extended to more students to provide the structure necessary to develop healthy habits that become lifelong behaviors. There should also be consideration for other health professionals, specifically in leisure services, to implement more athletic programs that are similar in structure and goals of high school sports. These recommendations, if implemented, could have a profound impact on the future health of the nation by contributing to the improvement of the amount of physical activity, increasing perceived wellness, and hopefully resulting in decreasing the obesity epidemic and other health related diseases association with physical inactivity and poor personal wellness.

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Appendix A

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE:	April 16, 2013
TO:	Joseph Lovell
FROM:	Lindenwood University Institutional Review Board
STUDY TITLE:	[450946-1] Investigating the relationship between high school athletic participation and physical activity and wellness throughout the life span.
IRB REFERENCE #:	
SUBMISSION TYPE:	New Project
ACTION:	APPROVED
APPROVAL DATE:	April 16, 2013
EXPIRATION DATE:	April 16, 2014
REVIEW TYPE:	Expedited Review

Thank you for your submission of New Project materials for this research project. Lindenwood University Institutional Review Board has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a study design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on the applicable federal regulation.

Please remember that informed consent is a process beginning with a description of the study and insurance of participant understanding followed by a signed consent form. Informed consent must continue throughout the study via a dialogue between the researcher and research participant. Federal regulations require each participant receive a copy of the signed consent document.

Please note that any revision to previously approved materials must be approved by this office prior to initiation. Please use the appropriate revision forms for this procedure.

All SERIOUS and UNEXPECTED adverse events must be reported to this office. Please use the appropriate adverse event forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This project has been determined to be a project. Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the completion/amendment form for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of April 16, 2014.

Please note that all research records must be retained for a minimum of three years.

Appendix B

PHYSICAL ACTIVITY AND WELLNESS THROUGHOUT THE LIFESPAN

INTRODUCTION AND INFORMED CONSENT

You are invited to participate in a research study with the purpose of investigating the relationship between athletic participation and physical activity and wellness later in life. Your participation will take approximately 10 minutes to respond to survey questions. It is anticipated that approximately 100 individuals representing the adult life stages will be involved in the study.

There are no anticipated risks associated with this research. There are no direct benefits for you participating in this study. However, your participation will contribute to the knowledge about maintaining healthy lifestyles throughout the life span, which may support future programs that may help society.

Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

We will do everything we can to protect your privacy. The researcher will not know who has responded to surveys. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study and the information collected will remain in the possession of the investigator in a safe location.

If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Joseph Lovell, 636-255-2213, or the Supervising Faculty, Dr. Paul Wright, 636-487-1399. You may also ask questions or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Jann Weitzel, Vice President for Academic Affairs at 636-949-4846.

The survey includes the Godin Leisure Time Exercise Questionnaire and a modified Perceived Wellness Questionnaire. These questionnaires were developed for the purpose of measuring and comparing physical activity and wellness among adults. Completing the survey confirms that you have permitted the researcher to assess your habits of physical activity and perceived wellness.

Appendix C

PHYSICAL ACTIVITY AND WELLNESS THROUGHOUT THE LIFESPAN SURVEY

DEMOGRAPHICS SECTION

1. Please identify your gender…….……..[ ] Male [ ] Female
2. Did you participate in high school varsity athletics for two or more years?…….[ ] Yes [ ] No
   e.g., Baseball, Basketball, Cross Country, Field Hockey, Football, Gymnastics, Ice Hockey, Lacrosse, Softball, Soccer, Swimming and Diving, Tennis, Track and Field, Volleyball, Water Polo, Wrestling
3. Please indicate your ethnicity……..[ ] African-American [ ] Caucasian [ ] Hispanic or Latino
   [ ] Native-American [ ] Asian [ ] Other_____
4. What is your age?……..._____
5. What is your marital status?.....[ ] Single, never married [ ] Married or domestic partnership
   [ ] Widowed [ ] Divorced [ ] Separated
6. How many years, to this point, have you participated in structured athletic programs including all athletic programs offered in recreational youth and adult programs, high school, collegiate, amateur, and/or professional?....._____

GODIN LEISURE-TIME EXERCISE QUESTIONNAIRE

7. During a typical 7-Day period during your leisure time, how many times on the average do you do the following kinds of exercise for more than 20 minutes during your free time?
   a. **Strenuous Exercise**
      (Heart Beat Rapidly)…… ……._____
      e.g., Running, Jogging, Hockey, Football, Soccer, Squash, Basketball, Cross Country Skiing, Judo, Roller Skating, Vigorous Swimming, Vigorous Long Distance Bicycling
   b. **Moderate Exercise**
      (Not Exhausting)……._____
      e.g., Fast Walking, Baseball, Tennis, Easy Bicycling, Volleyball, Badminton, Easy swimming, Alpine Skiing, Popular and Folk Dancing
   c. **Mild Exercise**
      (Minimal Effort)……._____
      e.g., Yoga, Archery, Fishing, Bowling, Horseshoes, Golf, Snow-mobiling, Easy Walking

8. During a typical 7-Day period during your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?

   [ ] Never (0/wk) [ ] Rarely (1-2/wk) [ ] Sometimes (3-4/wk) [ ]Often (5-8/wk)

PERCEIVED WELLNESS SURVEY

The following statements are designed to provide information about your wellness perceptions. Please carefully and thoughtfully consider each statement, and then circle the one response option with which you most agree.

	Very strongly disagree				*Very strongly agree*
9. There have been times when I felt inferior to most of the people I knew……. ……..	..…….....1	2	3	4	5
10. Members of my family come to me for support…….	..……1	2	3	4	5
11. My physical health has restricted me in the past…….....	……...1	2	3	4	5
12. In general, I feel confident about my abilities…….....	……...1	2	3	4	5
13. Sometimes I wonder if my family will really be there for me when I am in need……...	……..1	2	3	4	5
14. My body seems to resist physical illness very well…….....	……..1	2	3	4	5
15. I sometimes think I am a worthless individual……...	……..1	2	3	4	5
16. My friends know they can always confide in me and ask me for advice……..	……...1	2	3	4	5
17. My physical health is excellent……..	……..1	2	3	4	5
18. I am uncertain about my ability to do things well in the future……..	……..1	2	3	4	5
19. My family has been available to support me in the past…….	……..1	2	3	4	5
20. Compared to people I know, my past physical health has been excellent……..	……...1	2	3	4	5
21. I will always be secure with who I am……	……...1	2	3	4	5
22. In the past, I have not always had friends with whom I could share my joys and sorrows……...	……...1	2	3	4	5
23. I expect to always be physically healthy…….....	……..1	2	3	4	5
24. In the past, I have felt sure of myself among strangers……..	……..1	2	3	4	5
25. My friends will be there for me when I need of help…….	……..1	2	3	4	5
26. I expect my physical health to get worse…….....	……...1	2	3	4	5

Vitae

Joseph J. Lovell graduated from Southern Virginia University with an undergraduate degree in physical education and recreation administration. He completed a Master of Science degree in recreation and sport management at the University of Idaho. He has worked in both campus and community recreation organizations as well as in collegiate athletic departments. He is a Certified Park and Recreation Professional through the National Recreation and Park Association. His professional interests include youth sport education, physical activity and wellness across the lifespan, and leisure education. He is currently an assistant professor of recreation and the department chair for the recreation administration program at Lindenwood University.