The Influence of Parent/Caregiver Physical Activity Levels on the Physical Activity Levels of Children/Adults with Disabilities

Victor Marcellis Brundage

Indiana University of Pennsylvania

Follow this and additional works at: https://knowledge.library.iup.edu/etd

Recommended Citation

This Thesis is brought to you for free and open access by Knowledge Repository @ IUP. It has been accepted for inclusion in Theses and Dissertations (All) by an authorized administrator of Knowledge Repository @ IUP. For more information, please contact sara.parme@iup.edu.
THE INFLUENCE OF PARENT/CAREGIVER PHYSICAL ACTIVITY LEVELS ON THE PHYSICAL ACTIVITY LEVELS OF CHILDREN/ADULTS WITH DISABILITIES

A Thesis
Submitted to the School of Graduate Studies and Research
In Partial Fulfillment of the
Requirements for the Degree
Master of Science

Victor Marcellis Brundage
Indiana University of Pennsylvania
August 2011
Indiana University of Pennsylvania
The School of Graduate Studies and Research
Department of Health and Physical Education

We hereby approve the thesis of

Victor Brundage
Candidate for the degree of Master of Science

______________________________
__Signature on File__________________________

Dr. Madeline Paternostro-Bayles
Professor of Health and Physical Education

______________________________
__Signature on File__________________________

Dr. Richard Hsiao
Associate Professor of Health and Physical Education

______________________________
__Signature on File__________________________

Dr. David Lorenzi
Associate Professor of Health and Physical Education

ACCEPTED

______________________________
_____Signature on File________________________

Timothy P. Mack, Ph.D
Dean
School of Graduate Studies and Research
Physical activity is important and beneficial to all individuals. Physical activity can enhance self-esteem, reduce the risk of developing health complications, and improve overall quality of life. Parents can have a major impact on the lives of their children. When parents are more physically active, generally their children are more active as well. Physical activity is also beneficial to individuals with disabilities. These individuals are also encouraged to be physically active despite their limitations. The purpose of this study was to analyze the activity levels of parents/caregivers and children/adults with disabilities.

The subjects for this investigation were participants of The Special Needs Activity Program (SNAP) at Indiana University of Pennsylvania. Thirteen caregivers and fifteen parents provided data; while thirteen adults with disabilities and fifteen children with disabilities were analyzed. The investigator attended SNAP sessions in which the parents/caregivers completed surveys for themselves and on behalf of the children/adults with disabilities for whom they take of. The surveys included the Modifiable Activity Questionnaire for Adults, the Modifiable Activity Questionnaire for Children, the Aerobics Center Longitudinal Study Physical Activity Questionnaire, and the Physical Activity Scale for Individuals with Physical Disabilities.
(PASIPD). All of these are paper and pencil surveys that take approximately 10 minutes to complete separately, and that assess physical activity.

The results indicated that there was a significant difference between the activity levels of the parents/caregivers and the children/adults with disabilities. Activity levels were categorized as light, moderate, and strenuous activities. The disabilities did not greatly affect the activity of the individuals with disabilities. Children are recommended to achieve at least 60 minutes of activity on most days of the week, and adults are encouraged to obtain 30 minutes each day. The results indicated that the children with disabilities did not meet these guidelines, while the parents/caregivers did meet nationally recommended guidelines for physical activity.
ACKNOWLEDGEMENTS

First and foremost I would like to thank God for giving me the strength and perseverance to complete this investigation. I would also like to thank my family for their love and continued support throughout my academic career. I would also like to express gratitude to the members of my committee. I would like to thank my Chair, Dr. Madeline Paternostro-Bayles for her support and encouragement through the entire process, and motivating me to reach my highest potential. I would also like to thank Dr. Richard Hsiao for his assistance with this project, particularly with the data analysis. A special thank you is given to Dr. David Lorenzi for allowing me to use the SNAP program at IUP for this investigation.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>INTRODUCTION…………………………………………………..1</td>
</tr>
<tr>
<td></td>
<td>Statement of the Problem…………………………………………….3</td>
</tr>
<tr>
<td></td>
<td>Hypotheses………………………………………………………………3</td>
</tr>
<tr>
<td></td>
<td>Definition of Terms…………………………………………………...4</td>
</tr>
<tr>
<td></td>
<td>Limitations…………………………………………………………… 5</td>
</tr>
<tr>
<td></td>
<td>Assumptions…………………………………………………………..6</td>
</tr>
<tr>
<td></td>
<td>Significance of the Study……………………………………………..6</td>
</tr>
<tr>
<td>II</td>
<td>REVIEW OF LITERATURE………………………………………...7</td>
</tr>
<tr>
<td></td>
<td>General Background on Physical Activity…………………………7</td>
</tr>
<tr>
<td></td>
<td>Physical Activity as it Relates to Children/Adolescents…………11</td>
</tr>
<tr>
<td></td>
<td>Physical Activity as it Relates to Individuals with Disabilities………14</td>
</tr>
<tr>
<td></td>
<td>Factors That Influence Physical Activity……………………………..16</td>
</tr>
<tr>
<td></td>
<td>Parental Influence of Physical Activity on Children………………..18</td>
</tr>
<tr>
<td></td>
<td>Parental Influence of PA on Individuals with Disabilities………….20</td>
</tr>
<tr>
<td>III</td>
<td>METHODS…………………………………………………………...23</td>
</tr>
<tr>
<td></td>
<td>Subjects………………………………………………………………23</td>
</tr>
<tr>
<td></td>
<td>Procedures…………………………………………………………….24</td>
</tr>
<tr>
<td></td>
<td>Instruments……………………………………………………………25</td>
</tr>
<tr>
<td></td>
<td>Design &amp; Analysis…………………………………………………..26</td>
</tr>
<tr>
<td>IV</td>
<td>RESULTS AND DISCUSSION……………………………………..28</td>
</tr>
<tr>
<td></td>
<td>Results………………………………………………………………28</td>
</tr>
<tr>
<td></td>
<td>Types of Disabilities………………………………………………….31</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>Ages of Participants</td>
</tr>
<tr>
<td>2</td>
<td>Exercise of Participants (Days of the Week)</td>
</tr>
<tr>
<td>3</td>
<td>Significance of Activity Based on Disability</td>
</tr>
<tr>
<td>4</td>
<td>Correlation of Activity Based on Disability</td>
</tr>
<tr>
<td>5</td>
<td>Aerobics Study t-test</td>
</tr>
<tr>
<td>6</td>
<td>PASIPD t-test</td>
</tr>
<tr>
<td>7</td>
<td>Aerobics Study and PASIPD t-test</td>
</tr>
</tbody>
</table>
### LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Types of Disabilities (Adults)</td>
<td>31</td>
</tr>
<tr>
<td>2</td>
<td>Types of Disabilities (Children)</td>
<td>32</td>
</tr>
<tr>
<td>3</td>
<td>Marital status of Parents/Caregivers</td>
<td>34</td>
</tr>
<tr>
<td>4</td>
<td>Physical Activity</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>MAQ Leisure Activity (Hours/Week)</td>
<td>37</td>
</tr>
<tr>
<td>6</td>
<td>MAQ Television Viewing (Hours/week)</td>
<td>38</td>
</tr>
<tr>
<td>7</td>
<td>PASIPD Leisure Time Activity</td>
<td>40</td>
</tr>
<tr>
<td>8</td>
<td>PASIPD Leisure Time Activity Hours</td>
<td>40</td>
</tr>
<tr>
<td>9</td>
<td>PASIPD Household and Work-Related Activity</td>
<td>41</td>
</tr>
<tr>
<td>10</td>
<td>PASIPD Household and Work-Related Activity Hours</td>
<td>41</td>
</tr>
</tbody>
</table>
CHAPTER I
INTRODUCTION

Parents have major influences on their children regarding their choices and behaviors. Parents more often than not, set the blueprint for the way that their children carry themselves and view life. Children should view their parents as role models, and parents should engage in activities that will positively affect their children’s long-term behavior and habits. There are many factors that determine whether or not their children are physically active. Parental influence can be one of those factors. Physical activity at a young age is crucial and extremely important. Children and adolescents who participate in physical activity at a young age are at a greater advantage than their peers who are not physically active. Physical activity in children has many benefits. Physically active children are less likely to become obese, they perform better in school, they have a higher self-esteem and self-efficacy, and they develop exercise habits that will be beneficial to them when they reach adulthood (Rothon, 2010).

Physical activity is not only beneficial to children, but to adults as well. Adults who are physically active experience less stress and depression symptoms. Adults who report being physically active have more energy and do not fatigue as easily. Adults who are not physically active increase their chances of developing health issues such as high blood pressure, high cholesterol, higher frequency of injuries, and heart diseases (Sothern, 1999). In addition, adults who are physically active are less obese. Physical activity has been proven to relieve stress in individuals. Engagement in regular physical activity also promotes overall good health (Sothern, 1999).

Children have many opportunities to engage in physical activity. They can be physically active at home or at school. Childhood obesity is on the rise, and researchers believe that persistent physical activity in children will decrease their chances of becoming obese. At home,
children may play in their back yards or at the park (Stellino, 2010). Specific exercise and physical activity guidelines have been established for children and adolescents. They are encouraged to participate in an average of at least 60 minutes of physical activity per day. This recommendation can be achieved at home but also at school as well. Young children are granted the opportunity to participate in recess at school. Researchers believe that recess time can make a positive contribution to the daily physical activity requirements for children (Stellino, 2010).

It is undisputable that parents can have an impact on their children’s engagement in physical activity. For example, parents should encourage their children to be more physically active and spend less time participating in sedentary behaviors such as television viewing. Excess television viewing is related to negative health outcomes for both children and adults (Jago, 2010). Children are not meeting their physical activity requirements, and they are exceeding recommended TV viewing guidelines. Studies have indicated that as parental TV viewing increases, TV viewing in children increases as well. This leads to more sedentary time and less engagement in physical activity for both populations (Jago, 2010).

Physical activity is also beneficial to the disabled population as well. The majority of youth with disabilities are not meeting their recommendations for physical activity. Youth with disabilities are much more likely to be physically inactive than youth without disabilities (Rimmer, 2008). Youth with disabilities engage in more sedentary behaviors per day than youth without disabilities. These behaviors include television viewing, and playing video or computer games. They are also less likely to participate in team or organized sports. In addition, youth with disabilities experience a higher rate of obesity than their peers who are not disabled (Rimmer, 2008).
Similarly, adults with disabilities are less active than adults without disabilities. This can be the result of several different factors such as the disability itself, decreased aerobic capacity and decreased strength, and physiologic decline (Gerberding, 2007). Similar to youth with disabilities, adults with disabilities experience many barriers to physical activity. These barriers may include the lack of transportation to fitness facilities, a perception that exercise facilities are not meant for the disabled population, lack of adequate exercise equipment, and lack of sufficient exercise prescriptions. Physical activity is important to all individuals (disabled and non-disabled), and barriers should be addressed to promote healthier lifestyles for everyone (Gerberding, 2007).

Statement of the Problem

The purpose of this study is to examine the physical activity levels of children and adults with disabilities and parents/caregivers. The study seeks to determine whether or not physically active parents influence their children to be physically active. This study will observe the influence of parent/caregiver physical activity (PA) levels on the PA levels of children and adults with disabilities. 

Research Question: What is the influence of parent/caregiver physical activity levels on the physical activity levels of children and adults with disabilities?

Hypotheses

1. There will be a difference in the activity levels of the parents/caregivers compared to the children and adults with disabilities.

2. The physical activity levels of the children/adults with disabilities will be dependent upon the type of disability they possess.
3. The reported physical activity levels of the children with disabilities will be lower than nationally recommended PA guidelines.

4. The reported physical activity levels of the parents/caregivers will be lower than nationally recommended PA guidelines.

**Definition of Terms**

1. *Physical Activity* (PA): Any movement that works your muscles and uses more energy than you use when you’re resting. Examples include walking, running, dancing, swimming, yoga, and gardening.

2. *Caregiver*: A person who cares for someone who is sick or disabled.

3. *Disability*: The condition of being unable to perform as a consequence of physical or mental unfitness.

4. *Children*: The human population between the ages of birth and puberty.

5. *Adolescence*: The period of physical and psychological development from the onset of puberty to maturity.

6. *Influence*: A power affecting a person, thing, or course of events.

7. *Disease*: An impairment of health or a condition of abnormal functioning.

8. *Exercise*: Exercise is physical activity that is planned, structured, and repetitive for the purpose of conditioning any part of the body. Exercise is utilized to improve health, maintain fitness and is important as a means of physical rehabilitation.

9. *Hypertension*: high blood pressure: a common disorder in which blood pressure remains abnormally high (a reading of 140/90 mm Hg or greater).

10. *Cardiovascular Disease*: Diseases of the heart and blood vessels.
11. **Counseling**: guidance: something that provides direction or advice as to a decision or course of action.

12. **Intervention**: the act or fact of interfering so as to modify.

13. **Habit**: an action which has become automatic or characteristic by repetition.

14. **Obesity**: a medical condition in which excess body fat has accumulated to the extent that it may have an adverse effect on health, leading to reduced life expectancy, and/or increased health problems.

15. **Depression**: Depression is a common mental disorder that includes depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration.

16. **Sedentary**: Requiring sitting or little activity.

17. **Suicide**: The act of intentionally killing one’s self.

18. **Fatigue**: temporary loss of strength and energy resulting from hard physical or mental work.

19. **Socio-economic status (SES)**: Socioeconomic status is an economic and sociological combined total measure of a person’s work experience and of an individual’s or family’s economic and social position relative to others, based on income, education, and occupation.

20. **Motivation**: That which gives purpose and direction to a behavior.

**Limitations**

1. The physical activity of the individuals with disabilities will be mostly limited by the underlying disability.
2. The physical activity levels of the parents/caregivers and individuals with disabilities will only be as accurate as they report by survey.

3. The parents/caregivers levels of physical activity will be influenced by the severity of the disability of the individuals with disabilities.

Assumptions

1. Parents/caregivers will report correctly their levels of physical activity. The levels of physical activity of the individuals with disabilities will be reported correctly as well.
2. The severity of the disability will influence the PA levels of the individuals with disabilities as well as the PA levels of the parents/caregivers.

Significance

This study will examine the physical activity levels of parents/caregivers and children and adults with disabilities. The results will indicate the PA levels of these groups. The results will also indicate if the parents/caregivers are meeting nationally recommended guidelines for physical activity. The same is true for the individuals with disabilities. If they are not meeting these guidelines, adjustments could be made to change their PA habits and ultimately promote a healthier lifestyle.

Additionally, several different types of disabilities will be analyzed. This is significant because physical activity may be dependent upon the severity of the disability. The study will compare various disabilities of the participants and evaluate PA levels among them. Once this issue is addressed, parents/caregivers and the individuals with disabilities may be able to positively modify their PA habits based upon the disability.
CHAPTER II
REVIEW OF LITERATURE

The purpose of this chapter is to review the current literature associated with physical activity (PA). Chapter 2 is subdivided into the following areas: (1) General background on physical activity; (2) Physical activity as it relates to children/adolescents; (3) Physical activity as it relates to individuals with disabilities; (5) Factors that influence PA; (4) Parental influence of PA on children/adolescents; (5) Parental influence of PA on individuals with disabilities.

General Background on Physical Activity

The purpose of this section is to provide important background information on parental influences on physical activity on children and adolescence. Why physical activity is important, epidemiology evidence, and factors that influence PA will be examined.

It is indisputable that exercise and frequent involvement in physical activity is important to an individual’s health and overall well-being. Daily physical activity can build a healthy heart, increase self-esteem and self-efficacy in individuals, stimulate muscle growth, and reduce the risk of several health related diseases such as osteoporosis and cardiovascular disease. Engagement in physical activity not only promotes a healthier body, but also provides individuals with more energy, better sleeping patterns, and better eating habits than those who are sedentary (Sothern, 1999).

Healthy People 2010 made it a focus to express the importance of physical activity for all people with and without disabilities. Physical activity is also beneficial to youth with disabilities. For example, a study in The American Journal of Health Promotion analyzed the benefits of physical activity for youth with developmental disabilities. Physical activity is important in maintaining adequate health in all individuals. Developmental disorders are defined as any
disease or disorder that may affect development which may include autism, mental retardation, cerebral palsy (CP), Down syndrome (DS), and Rett Syndrome. The results from this systematic review provided evidence that physical activity is beneficial to youth with developmental disabilities (Johnson, 2009). These studies are important to conduct because the results will allow health care professionals to make certain recommendations for physical activity on specific populations. The results indicated that physical activity can improve gross motor function, improve aerobic capacity, and high levels of participant/parent satisfaction were found. Positive effects of exercise programs for individuals with DS were found, and positive benefits of strength exercises for people with CP were also found. In addition, positive health associations were found for those with mental retardation (Johnson, 2009).

Physical activity can be classified into three categories: leisure-time physical activity (LTPA), work-related physical activity (WRPA), and total physical activity (TPA). Leisure-time physical activity may consist of a variety of different activities. Light activities may include dancing, walking, bowling, golfing, gardening, etc. Vigorous activities may include high intensity work-outs and sports, aerobics, running, swimming, or bicycling. Work-related physical activity may refer to heavy household chores and strenuous job activities. Heavy household work could include scrubbing floors or washing windows. Strenuous job activities would be a job that requires much physical effort such as lifting heavy loads, stooping, kneeling, or crouching. Total physical activity would be a combination of LTPA and WRPA (Baker, 2004).

In relation to adults, approximately 20% of adults worldwide report feelings of persistent fatigue. Physical activity is a healthy behavior that can combat feelings of fatigue and low energy. Fatigue is considered a major public health concern; but it can be prevented and controlled through regular physical activity. When active adults are compared to their sedentary
peers, studies have suggested that there was an association found between physical activity and reduced feelings of low energy and fatigue (Puetz, 2006).

Physical activity can also prevent certain heart diseases in adults such as cardiovascular disease. Adults often engage in physical activity counseling to improve their PA habits. As a result, improvements are found in their blood pressure and cholesterol levels. Studies have indicated that adults who receive physical activity counseling increase their activity time by 40 minutes per week. Counseling may include strategies to make more time to be physically active, and an awareness of the benefits of a physically active lifestyle (Lin, 2010). Counseling may also include clinical experimental trials where adults with high risk factors for developing cardiovascular disease participate in an exercise program. This can be beneficial for many reasons. First, an implemented program will reduce the risk of developing the disease. Secondly, intervention trials can allow an individual to determine the type of intensity he should regularly exercise; whether it is low, moderate, or vigorous. Also, individuals will feel more comfortable using exercise equipment, which they may not have been comfortable before, and this could lead to regular engagement in exercise and physical activity (Lin, 2010).

Physical activity is also important to children and adolescents as well. Childhood obesity is on the rise, and this can be related to the lack of physical activity of adolescents. Physical activity can undoubtedly reduce the risk of obesity in children. This is important because obesity can potentially lead to more complicated health issues in the future. The lack of physical activity can also lead to high blood pressure, high cholesterol, a higher frequency of injuries, and depression (Janssen, 2010). Based on a systematic review from the *International Journal of Behavioral Nutrition and Physical Activity*, several recommendations were provided for adolescent physical activity levels. Children and youth ages 5-17 should accumulate at least an
average of 60 minutes per day, and several hours of at least moderate intensity physical activity. It was found that some of the health benefits could be achieved through at least 30 minutes per day. The second recommendation was that when possible, more vigorous intensity activities should be added, including activities that strengthen muscle and bone. The last recommendation was that the majority of physical activity should be achieved through aerobic activities. On at least 3 days of the week, muscle and bone strengthening activities should be incorporated (Janssen, 2010).

Physical activity can also prevent chronic diseases in youth. Clinical, epidemiological and basic research evidence support the fact that engagement in regular physical activity is an effective tool for preventing chronic diseases and promoting overall health. For high risk youth (physically inactive and obese), moderate intensity exercise is recommended. However, the numerous benefits of physical activity are dependent upon the type of exercise performed, and the intensity and volume of the activity performed by the individual. Benefits include the reduction of low density lipoproteins and the increase of high density lipoproteins. For individuals with type II diabetes, physical activity improves glucose metabolism, and physical activity can improve strength, body image, and self-esteem in all individuals. In addition, the reduction of back injuries can be found in people who are physically active. Furthermore, individuals who are more physically active and less sedentary decrease their stress levels, which may enhance the immune system (Sothern, 1999).

Physical activity also decreases depression in children and adolescents. Children can be referred to as aged 5-10, and adolescents are considered to be ages 11-16 years old. Mental illness and depression are important topics to study because adolescents with mental health difficulties are at increased risk of suicide, isolation, substance abuse, and academic
underachievement. Physical activity has been proven to reduce depression in high risk children and adolescents (Rothon, 2010). There are four important psychosocial explanations for the link between physical activity and reduced depression. The first explanation is the distraction hypothesis. This theory explains that physical activity provides a “time out” to an individual, which enhances mood. The “mastery” hypothesis is the second explanation, and this suggests that an individual can experience a sense of achievement through physical activity such as learning a new sport. This achievement can lead to an elevated mood and a higher sense of accomplishment. The third explanation is an indirect effect in which physical activity can enhance mood through increased social interaction. Social support is more readily available through participation in exercise classes or team sports. Finally, physical activity can increase self-esteem. Individuals who are physically active modify their body image, leading to overall improvement in self-image (Rothon, 2010).

**Physical Activity as it Relates to Children/Adolescents**

Schools have been encouraged to increase physical activity opportunities for children as a result of the childhood obesity epidemic. This can be obtained through adequate physical education programs, recess, and classroom-based physical activity breaks. School health practitioners need to become familiar with “what works” in order to increase children’s physical activity. When children are provided with the opportunity to participate in recess, the conditions should be those that actually promote increased physical activity. Children will be more physically active during recess when they are given choices that will accommodate their individual differences (Stellino, 2010). Activities and equipment should be appropriate based on gender, age, and weight, and children should be allowed time to experiment with different activities to determine which activities they enjoy the most. The importance of physical activity
should be explained to children at an early age. This will help to reduce the steadily rising childhood obesity trend, and will help children develop positive habits which will be beneficial to them later in life (Stellino, 2010).

Recess has been considered a “free choice” time period in the days of elementary school children which could help formulate physical activity patterns and potentially reduce obesity. Recess can be a time of day where children can choose to be physically active on their own accord because most children have increasingly structured lives (Stellino, 2010). Healthy People 2010 and the Surgeon’s General recommend that children should engage in 30 to 60 minutes of activity on all or most days of the week. Increased physical activity during recess could allow children to potentially meet these guidelines. In addition, daily recess is undoubtedly a necessary part of the elementary school experience allowing children to develop health-related fitness, physical competence, and personal and social responsibility, in order that they are more likely to become active for a lifetime (Stellino, 2010).

Research has also suggested that recess can play a significant role in the learning and social development of children. Among children of both genders, increased physical activity during recess has been shown to improve their productivity, concentration, attention, and behavior in the classroom. Other benefits of physical activity during recess include the development of social skills, such as making choices, organizing games, interactions with play partners, and creating rules of play (Stellino, 2010). Most research indicates that boys are more active than girls during recess. Also, recess can make a worthwhile contribution to the recommended 60 minutes of moderate to vigorous physical activity per day for children. However, it has been proven that many children do not engage in enough physical activity during recess to significantly increase their fitness levels. As a result, children should participate in
more structured physical activity programs because this structure has been verified to be more beneficial for increasing a child’s physical activity levels as compared to recess (Stellino, 2010).

The environment can also play an important role in the physical activity levels of children. When children engage in activities at an early age, they are mostly likely performing activities that they enjoy doing. Children could be physically active in their back yard, playing in the street, or playing at the park. It is important that children play outside at a young age, and an emphasis should be placed on activities outside of school hours (Veitch, 2010). Social interaction with peers and children building friendships with one another can also contribute to their physical activity. Children who report having many friends in their community are much more likely to be physically active and play in their own yard, street, or playground. Children must engage in active free-play because recess time alone is not enough for them to meet their recommended physical activity guidelines. Parents should understand the importance of granting their children free-time to play once the school day has concluded. Increased physical activity in children can lead to increased self-esteem, low levels of obesity, and low levels of chronic diseases (Veitch, 2010).

When analyzing physical activity in children and adolescents, two categories can be formulated. These include unstructured outdoor free-play (or active free-play), and structured activities. Active free-play may consist of walking or cycling to school and activities performed during free-play time. Active free-play can contribute to the physical activity recommendations for children; however, structured physical activities are encouraged as well. Structured activities include organized sports or school sports (Veitch, 2010).

There are many benefits for children and adolescents who participate in organized sports. It has been proven that children who participate in organized sports experience a greater level of
academic and intellectual achievement than those who do not. Their educational aspirations increase, and adolescents such as high school students are less likely to drop out because they experience higher levels of self-efficacy and social support from their teammates and coaches (Rosewater, 2009). Studies have also indicated that adolescents who participate in organized sports are more likely to attend college and obtain better jobs with more responsibility and better pay. Sports allow students to feel better connected with school, attend regularly, and establish a greater social connection with peers (Rosewater, 2009).

**Physical Activity as it Relates to Individuals with Disabilities**

Children and adolescents are recommended to engage in at least 60 minutes a day or more of moderate to vigorous physical activity that is not only enjoyable, but developmentally appropriate as well. Unfortunately, the majority of youth with disabilities are not meeting this recommendation (Rimmer, 2008). Improving fitness levels and increased participation in physical activity for children and adolescents has many health benefits. For example, in adulthood the incidence of chronic diseases such as type 2 diabetes and heart diseases are reduced. Also, secondary conditions such as weakness, obesity, mobility, fatigue, and social isolation are minimized or reduced. The rate of physical inactivity for youth with disabilities is much higher than youth without disabilities. Many experts believe that this will eventually lead to a greater number of health complications in adulthood for individuals with disabilities (Rimmer, 2008).

The low level of physical activity among youth with disabilities has been addressed by the Council on Children with Disabilities Executive Committee of the American Academy of Pediatrics (AAP). The Council suggested physical activity participation for youth with disabilities could increase by eliminating societal barriers and encouraging health professionals
to advocate higher levels of activity for all children, including those with disabilities (Rimmer, 2008). The Committee also encouraged pediatricians to emphasize to families and children with disabilities the importance of being involved in physical activities and competitive and recreational sports. Researchers have suggested that the barriers imposed on youth with disabilities may be the primary factor for their lack of involvement in physical activities. Studies have also suggested that children with disabilities are more likely to watch more hours of television a day than their non-disabled peers (Rimmer, 2008).

In addition, studies have indicated that youth with disabilities engage in more sedentary activities per day, such as playing video or computer games. Also, they are less likely to engage in team sports and organized sports. The low physical activity levels of children with disabilities are a major concern. This behavior can lead into adulthood, which can only lead to more serious health issues. As a result, an emphasis must be placed early in life for these individuals to engage in physical activities despite their limitations (Rimmer, 2008). Studies have also suggested that there is a significantly higher rate of obesity for youth with disabilities compared to non-disabled youth. Youth with disabilities have substantially less access to the same physical activity opportunities than youth without disabilities. These opportunities include riding a bike to school, participation in sports and recreation programs, and as a result they are more likely to be sedentary or physically inactive on the weekends. Aside from a “special” recreation program provided in a small number of communities, youth with disabilities are sometimes not offered the same opportunities to participate in sport and recreational activities compared to their non-disabled peers (Rimmer, 2008).

Similarly, studies have indicated that adults with disabilities are less physically active than adults without disabilities. This could be the result of several different factors. The disabling
condition itself could act as a hindrance to activity, and physiologic decline, such as decreased aerobic capacity, muscular strength, flexibility, and endurance is also a factor. In addition, due to personal or environmental barriers, there can oftentimes be a lack of access to physical activity programs and facilities for this population (Gerberding, 2007). Adults with disabilities experience greater barriers to regular physical activity compared to the general population. These include the perception that fitness facilities are unfriendly environments for those with a disability, lack of accessible exercise equipment and adequate space to move around, lack of information on available and accessible programs and facilities, and lack of transportation to fitness centers (Gerberding, 2007).

Physical inactivity for adults with disabilities is associated with increased functional limitation and higher risk of developing secondary conditions such as depression and weakness. It is understandable that adults with disabilities may not be able to achieve recommended levels of physical activity as a result of the severity of their disability (Gerberding, 2007). However, participation at lower levels has been determined to produce health benefits. Individuals who are unable to meet recommended levels may require specific physical activity programs that meet their specific needs. Barriers to physical activity should be addressed to promote healthier lifestyles in all adults, including those with disabilities (Gerberding, 2007).

**Factors That Influence Physical Activity**

There are several factors that may influence whether or not an individual is physically active. Socioeconomic status is a major influence on this topic. Several studies have indicated that individuals with low socioeconomic status (SES) are less physically active than those with high SES. Socioeconomic status is an economic and sociological combined total measure of a person’s work experience and of an individual’s or family’s economic and social position.
relative to others, based on income, education, and occupation (Wilson, 2004). Parents with low SES report higher perceptions of unpleasant neighborhoods, unattended dogs, neighborhood crime, and untrustworthy neighbors than parents with high SES. As a result, they do not allow their children to play outdoors as much because of these negative perceptions. Also, parents with low SES report lower access to recreational facilities. Parents with high SES are oftentimes more highly educated and more likely to join gyms and fitness facilities; whereas parents with low SES may have to devote their time and money elsewhere (Wilson, 2004).

Weight loss is also a factor that may influence an individual’s participation in physical activity. Physical activity can reduce the risk of obesity, but it can also maintain obesity as well. For those who are not considered obese by health guidelines, they may be motivated to be physically active to lose unwanted weight (Kruger, 2006). Physical activity has been proven to assist individuals with weight loss. An individual may be motivated to join a fitness club, or even higher a personal trainer to lose weight and increase his self-image. Adding physical activity to the daily routine and exercising 30 minutes or more daily are important factors for maintaining weight loss (Kruger, 2006).

In addition, enjoyment, entertainment, and pleasure are also factors that influence physical activity. An adolescent may be involved in a recreational basketball league solely because he loves the sport. He enjoys playing the game, and this motivates him to be physically active. An adult who understands the many benefits of a physically active lifestyle may be motivated to join a fitness facility because of the enjoyment of exercise. He may enjoy his cardio and resistance workouts and he is motivated to exercise several times a week (Henderson, 2002). Enjoyment is oftentimes linked to physical activity. Engagement in physical activity will allow an individual to feel physically and emotionally healthier. Research has indicated that individuals
who are physically active enjoy life more, they experience better health, and live longer lives (Henderson, 2002).

**Parental Influence of Physical Activity on Children**

Parents can undoubtedly have an impact on their children’s participation in physical activity. Parents should encourage their children to be more physically active and spend less time engaging in sedentary activities such as television viewing. A study in the journal *Bio-Med Central Public Health* compared the hours of television viewing of parents to their children to determine if active parents foster active children. A relationship was examined between parents’ and children’s physical activity and TV viewing. Positive effects are associated with child and adolescent physical activity, while excess TV viewing is related to negative health outcomes. Children are exceeding recommended TV viewing guidelines, and are not meeting physical activity recommendations (Jago, 2010).

This study was conducted in the United Kingdom (UK), and children 6 years old were recruited from 40 primary schools. Overall, 986 children and 539 parents provided data. Both the parents and children wore accelerometers for five days straight. Accelerometers are devices that are worn on either the ankle or hip that measure the magnitude of physical activities performed. The children and parents also answered a single question about how many hours per day they spent watching television. The results indicated that levels of TV viewing for both boys and girls increased as parental TV viewing increased. This resulted in more sedentary time and less engagement in physical activity for the children (Jago, 2010).

Other parental influences such as family cohesion, parent-child communication, and parental engagement can also impact children’s participation in physical activity. A longitudinal study from the *International Journal of Behavioral Nutrition and Physical Activity* analyzed
these characteristics. The study compared boys to girls and also examined other factors such as race and ethnicity, and socio-economic status. 13,246 adolescents participated in this study. 80 U.S. high schools and their corresponding middle schools were represented. The subjects were in grades 6 through 12 (Ornelas, 2007).

The adolescents filled out surveys that asked questions about different factors within the previous year. They answered questions about their weekly physical activity, the duration of the activity, and the type of activity that they participated in. They also answered questions about four parental characteristics. These characteristics included family cohesion, parental monitoring, parent-child communication, and parental engagement. The adolescents participated in an in-home interview which evaluated self-esteem and depression characteristics (Ornelas, 2007).

The results of this study indicated that parental education is a factor in their children’s involvement in physical activity. The more highly educated the parent, the more physically active the children were. In addition, the higher the parental engagement, parental monitoring, and family cohesion, the less depression was observed in the adolescent and their self-esteem increased as well. Consequently, this also led to higher levels of moderate to vigorous physical activity (MVPA) for the adolescent (Ornelas, 2007).

Neighborhood characteristics can also play an important role in children’s participation in physical activity. A study in the *American Journal of Health Promotion* analyzed the association of father involvement and neighborhood quality with kindergartners’ physical activity. The purpose of this study was to examine the role that fathers play in their children’s participation in physical activity, and also to examine neighborhood characteristics. The study is unique because it specifically examines the influence of the father. As a result, the study is more concentrated,
and can be compared with other studies that specifically examine the influence of mothers on their children’s PA levels (Beets, 2008).

This study consisted of children selected to participate in the Early Childhood Longitudinal Study-Kindergarten Cohort 1998-1999 (ECLS-K). The ECLS-K is a nationally representative sample of kindergarten children who attend approximately 1,000 public or private schools in the United States. The ECLS-K was designed to provide information from children and their parents, teachers, and schools related to developmental outcomes in physical health, psychosocial health, and academic achievement (Beets, 2008).

10,694 kindergartners living in 1,053 neighborhoods made up the data collection. Data was collected from the parents through personal interviewing and questionnaires. Measures that were assessed were television time, physical activity of the parent, parent characteristics, father-child time, neighborhood safety, and neighborhood characteristics (Beets, 2008). The results indicated that a higher father-child time resulted in a greater PA level for the children. Neighborhood quality also impacts a child’s participation in outdoor physical activities. If a parent considers their neighborhood to be unsafe due to factors such as high crime rates, then they will not permit their children to play outdoors. In addition, fathers should be involved with their children at an early age. Fathers can play an “activation” role in their children’s PA levels. The results also suggest that children’s PA levels and increased family participating in sports together is associated with increased father-child time (Beets, 2008).

**Parental Influence of PA on Individuals with Disabilities**

Physical inactivity among youth with disabilities can often be linked to physical, programmatic, and attitudinal barriers that limit recreation and sport opportunities within their communities. Common physical barriers include playgrounds and ball fields that are inaccessible
to children who use wheelchairs (i.e. grass surfaces, climbing apparatus with no ramps). Common programmatic barriers may include not having the proper support or staffing to accommodate the child during the activity, or not having knowledgeable staff who know how to adapt the game or sport to meet the child’s needs (Rimmer, 2008).

Parents of youth with disabilities should familiarize themselves with the importance of their children being physically active. Granted, the accommodations for activity depend on the type and severity of the disorder. These parents should not allow their children to engage in excess sedentary time. Parents should address the specific disability, and encourage their children to be physically active, and develop ways to make accommodations (Rimmer, 2008).

In addition, high level competition and emphasis on winning are significant attitudinal barriers that make it less desirable for directors and coaches of community recreation and sports programs to accommodate youth with disabilities. Many parents of children with higher athletic skills want their child to stand out in sports. Therefore, they do not want to include youth with disabilities in community sports programs. Also, parents of youth with disabilities often seek to protect their children from participating in competitive sports because of the fear that they may be verbally abused by other non-disabled children (Rimmer, 2008).

Parents can also have an impact on their children’s participation in physical activity at school during physical education. In the school environment, a team approach can be established to meet the specific goals and needs of youth with disabilities. Parents act as team members along with the student, physical education teacher, and adapted physical activity consultant (Arbuckle, 2010). The team must focus on effective communication in order for an activity plan to be created properly. This involves regular meetings, listening to everyone’s ideas, and developing reasonable objectives. Within the team approach, parents are expected to share the
expectations and goals that they have for their child. This will allow the APA consultant and physical education teacher to personalize and individualize an activity program that meets the specific needs of the child (Arbuckle, 2010).
CHAPTER III

METHODS

This study was intended to examine the physical activity levels of individuals with disabilities. A negative perception can sometimes be related to individuals with disabilities. People oftentimes assume that because a person is disabled, they are not physically active. This study addressed this issue. All individuals with disabilities are not sedentary. The purpose of the study was to confirm this fact, and at the same time discover the magnitude of physical activity for people with disabilities. In addition, this study was also meant to determine the relationship of parental influences on their children’s participation in physical activity. Parents can have a major impact on their children. In this study, the role of parental influences was examined in relationship to their children’s physical activity levels. This study also sought to determine how the physical activity levels of caregivers impacted the physical activity of individuals with disabilities.

Subjects

The subjects for this investigation were the participants of the Specials Needs Activity Program (SNAP) at Indiana University of Pennsylvania. Children as young as 5 years old, and adults up to 75 years old who participated in the program were observed. The parents of the children, and the primary guardian or caregiver of the adults with disabilities also participated in the study. The subjects were both male and female. The number of participants was 36. Inclusion criteria included parents who had a child enrolled in SNAP who had a disability, and children enrolled in SNAP who possessed disabilities. Also, caregivers who had adults enrolled in SNAP with disabilities, and adults in SNAP with disabilities.
Procedures

In order to obtain the necessary data for this study, questionnaires were handed out to parents and caregivers at one of the SNAP sessions. Parents and caregivers were asked to complete The Aerobics Center Longitudinal Study Physical Activity Questionnaire as well as The Modifiable Activity Questionnaire (MAQ). These questionnaires assessed the physical activity levels of the parents and caregivers. The principal investigator requested that these questionnaires be filled out and returned at the present SNAP session.

To obtain the data involving the actual participants of the SNAP program (children and adults with disabilities) a questionnaire was also used. The parents/caregivers of the children and adults with disabilities were asked to complete the Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) in order to assess the physical activity levels of the individuals with disabilities. This survey was completed a returned to the investigator at the same SNAP session as well.

Dr. David Lorenzi is the director of the SNAP program. The program is held in Zink Hall at Indiana University of Pennsylvania. It takes place in the gyms, fitness center, and pool. The program is held on Wednesdays and Saturdays. Wednesdays are sessions devoted to adults with disabilities, and Saturdays are devoted to children with disabilities. The primary investigator recruited the prospective subjects at one of the SNAP sessions. He attended two SNAP sessions on Wednesday nights for the adults with disabilities, and three sessions on Saturday mornings for the children with disabilities. At each of these sessions he first explained to the parents/caregivers the purpose of the study. Dr. Lorenzi was not present as the investigator explained the study to prospective subjects. The investigator explained the purpose of the study at the beginning of the SNAP sessions. He then handed out consent forms. The consent forms
were signed at the session. For those who were willing to participate, the investigator handed out the physical activity surveys, and asked that they be completed at the scene.

The surveys take approximately 10 minutes to fill out separately. They include The Aerobics Center Longitudinal Study Physical Activity Questionnaire, The Modifiable Activity Questionnaire, The Modifiable Activity Questionnaire for Adolescents, and The Physical Activity Scale for Individuals with Physical Disabilities. Parents/caregivers filled out The Aerobics Center Questionnaire and The Modifiable Activity Questionnaire. They also completed The MAQ for Children and The PASIPD on behalf of the children/adults with disabilities.

**Instruments**

The Aerobics Center Longitudinal Study Physical Activity Questionnaire assessed leisure and household activities. The timeframe of recall was the past 3 months. This was a paper and pencil test of approximately 20 questions. Activities that were assessed were walking, stair climbing, jogging or running, treadmill, bicycling, and swimming laps among other things. Common questions included how many sessions per week individuals participated in these activities, and the average duration for each session (minutes). The Modifiable Activity Questionnaire (MAQ) assessed leisure and occupational activity. The timeframe of recall was the past year and past week. This was also a paper and pencil test consisting of approximately 30 questions. Basketball, volleyball, martial arts, jogging, swimming, hunting, fishing, and tennis are some of the many activities that were assessed in this questionnaire. Participants were asked how many times they participated in these activities for each month within the past year. They were also asked the average number of times per month, and the average number of minutes each time. Participants were also asked how many hours per day they watch television, and how many years they participated in competitive sports.
The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) assessed leisure-time physical activity, household activity, and work-related activity. This was a short-term survey which assessed activity within the past week. It asked participants to list how many hours per week they engaged in stationary activities. This questionnaire also asked how many hours per week they engaged in light recreational activity, moderate recreational activity, and strenuous recreational activity. It also asked participants to list these activities. Questions about light household chores, heavy household chores, gardening, and home repairs were also asked. In addition, participants of this questionnaire were asked how often they worked for pay or as a volunteer within the past 7 days; with never, seldom, sometimes, and often being their choices. They were also asked how many hours they spent working for pay or as a volunteer within the past 7 days.

**Design & Analysis**

The investigator recorded the collected data into an SPSS file for analysis. SPSS statistics 17 was used. The descriptive statistics of the subjects was analyzed. Two different variables was created. The physical activity levels of the parents/caregivers and the physical activity levels of the individuals with disabilities. The investigator made correlations based on these variables. Correlations were made between the physical activity levels of the parents and the children with disabilities. Correlations were also made between the PA levels of the caregivers and the adults with disabilities.

Other factors that were examined was the disability itself and the type of physical activities. A main purpose of this study was to determine if the parents/caregivers and children/adults with disabilities were meeting nationally recommended guidelines for physical activity. As a result, the reported hours of activity were compared to these guidelines. The
children were required to have 60 minutes of activity a day, while the adults were recommended to have at least 30 minutes a day, or 150 minutes each week.
CHAPTER IV
RESULTS AND DISCUSSION

This study analyzed the physical activity levels of caregivers and adults with disabilities. This study also analyzed the physical activity levels of parents and children with disabilities. The data was collected from the Special Needs Activity Program (SNAP) at Indiana University of Pennsylvania. A variety of different variables were assessed in this study. The investigator examined the marital statuses of the parents and caregivers, the type of disability of the individual, and whether or not the individual with a disability was a wheel-chair user. In addition, a variety of different surveys were used to conduct this study. The Modifiable Activity Questionnaire (MAQ) for Adults and The Aerobics Center Longitudinal Study Physical Activity Questionnaire assessed the physical activity levels of the caregivers and parents. The MAQ assessed activity over the past year, and the Aerobics Study evaluated activity within the past three months. The MAQ for Adolescents was used to obtain the physical activity levels of the children with disabilities, and The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) examined the activity levels of both the children and adults with disabilities. The MAQ also assessed activity over the past year, and the disability survey over the past seven days.

Results

Thirteen caregivers and fifteen parents provided complete data. The marital statuses of the caregivers varied slightly. Five of the caregivers were single (n=5), five were married (n=5), three were divorced (n=3), and none were widowed (n=0). Two of the parents were single (n=2), ten were married (n=10), two were divorced (n=2), and one widowed (n=1). The mean age of the
caregivers was 41 years with a standard deviation of ±13 years. The mean age of the parents was 42 years with a standard deviation of ±5.6 years.

Also, thirteen adults with disabilities and fifteen children with disabilities were analyzed. For the adults with disabilities: nine had a developmental disability (n=9), one had cerebral palsy (n=1), one had a bi-polar disorder (n=1), one had an attention deficit disorder (n=1), and one was hearing impaired (n=1). None of the adults with disabilities were wheel-chair users. Their mean age was 40 years with a standard deviation of ±15.6 years. Similar to the adults with disabilities, none of the children with disabilities were wheel-chair users. Four types of disabilities were found in the children. These included epilepsy or seizure disorder (n=2), attention deficit hyperactivity disorder (n=2), Down syndrome (n=2), and autism (n=9). The mean age of the children with disabilities was 10 years with a standard deviation of ±3.5 years.

It was reported that two of the children with disabilities exercised greater than five days a week. Seven of the children exercised 3-5 days a week, and five exercised 1-2 days a week, while one had no activity at all. The parents also provided data and were asked questions about demographics. Four of the parents exercised 3-5 days a week, five exercised 1-2 days a week, and six never exercised at all. Thirteen of the parents were employed, and two were unemployed. Seven of the parents graduated from high school, four graduated from college, and three obtained advanced degrees such as a master’s or doctorate. It was reported that 8 of the caregivers exercised between 3-5 days a week. Four of the caregivers exercised 1-2 days a week, while one never exercised at all. Twelve of the caregivers were employed, while one was unemployed. Seven of the caregivers received a high school diploma, four received a college degree, and two received an advanced degree. Four of the adults with disabilities exercised 3-5 days a week, six exercised for 1-2 days a week, and three never exercised at all.
Table 1: *Ages of Participants*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Mean</th>
<th>Standard Deviation (±SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers; N=13</td>
<td>41 years</td>
<td>13 years</td>
</tr>
<tr>
<td>Parents; N=15</td>
<td>42 years</td>
<td>5.6 years</td>
</tr>
<tr>
<td>Adults with disabilities; N=13</td>
<td>40 years</td>
<td>15.6 years</td>
</tr>
<tr>
<td>Children with disabilities; N=15</td>
<td>10 years</td>
<td>3.5 years</td>
</tr>
</tbody>
</table>

Table 2: *Exercise of Participants (Days of the Week)*

<table>
<thead>
<tr>
<th>Participant</th>
<th>Greater than 5</th>
<th>3-5</th>
<th>1-2</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caregivers</td>
<td>0</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Parents</td>
<td>0</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Adults with disabilities</td>
<td>0</td>
<td>4</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Children with disabilities</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Types of Disabilities

Figure 1: Types of Disabilities (Adults)
Hypothesis #2 states that the physical activity levels of the children/adults with disabilities will be dependent upon the type of disability that they possess. This hypothesis proved to be incorrect. The participants with disabilities were examined by light, moderate, and strenuous activity. The type of disability did not play a major factor in their activity levels. A one-way ANOVA and Tukey test were performed which revealed that walking was the only activity that was significant between the two groups (p=.038). The two groups included the children/adults with disabilities. Other activities were looked at, but these did not prove to be

Figure 2: Types of Disabilities (Children)
significant. These included stationary activities, light activities, and moderate activities. A
Pearson’s Correlation was also used to analyze this data. It was found that there was a significant
correlation between the disability of the individual, and how often he engaged in light sport or
activity (p=.029). In the table significance is denoted by an asterisk.

Table 3: Significance of Activity Based on Disability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>13.4</td>
<td>8</td>
<td>1.7</td>
<td>2.7</td>
<td>.038*</td>
</tr>
<tr>
<td>Light Sport</td>
<td>9.4</td>
<td>8</td>
<td>1.2</td>
<td>1.4</td>
<td>.251</td>
</tr>
<tr>
<td>Moderate Sport</td>
<td>4.0</td>
<td>8</td>
<td>.5</td>
<td>.84</td>
<td>.58</td>
</tr>
<tr>
<td>Vigorous Sport</td>
<td>1.9</td>
<td>8</td>
<td>.24</td>
<td>.26</td>
<td>.97</td>
</tr>
</tbody>
</table>

Table 4: Correlation of Activity Based on Disability

<table>
<thead>
<tr>
<th>Variable</th>
<th>Number</th>
<th>Sig.</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>27</td>
<td>.665</td>
<td>.087</td>
</tr>
<tr>
<td>Light Sport</td>
<td>27</td>
<td>.029</td>
<td>.421</td>
</tr>
<tr>
<td>Moderate Sport</td>
<td>27</td>
<td>.769</td>
<td>.059</td>
</tr>
<tr>
<td>Vigorous Sport</td>
<td>27</td>
<td>.891</td>
<td>.028*</td>
</tr>
</tbody>
</table>
Figure 3: Marital Status of Parents/Caregivers

Both the parents and caregivers completed The Aerobics Center Longitudinal Study Physical Activity Questionnaire. This study assessed their activity for the past three months. The study asked questions regarding their walking, jogging, stair climbing, and other physical activities. Participants were asked how many sessions per week they participated in each activity, and the average duration per session (minutes). Thirteen caregivers and fifteen parents completed this study. Based on the results, twenty participants engaged in walking, and sixteen people participated in stair climbing. Only four people participated in jogging or running, and only six engaged in activity on the treadmill. Two people participated in bicycling, one for swimming laps, and three in aerobic dance. When it came to sports: four participated in moderate sports, and only one person engaged in vigorous sports. The intensity of the activities were defined in the surveys. For example, moderate sports included activities such as leisure volleyball, social dancing, and golf. Vigorous activities included exercise involving running, such as basketball.
and soccer. Four participants reported weight training, twenty-seven in household activities, and fifteen for lawn work. Also, an independent samples t-test was used to compare the results of the Aerobics Study between the parents/caregivers. A significant difference was found between weight training in the two groups (p=.020). The caregivers participated more in walking than the parents did. The mean for the caregivers was .77, while the mean for the parents was .73. The parents participated more in stair climbing than the caregivers did. The mean for the parents was .60, while the mean for the caregivers was .54. Also, more caregivers participated in jogging/running (mean=.23), as compared to the parents (mean=.07). In the table significance is denoted by an asterisk.

Table 5: Aerobics Study t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight Training</td>
<td>2.488</td>
<td>26</td>
<td>.020*</td>
</tr>
<tr>
<td>Walking</td>
<td>.211</td>
<td>26</td>
<td>.835</td>
</tr>
<tr>
<td>Stair Climbing</td>
<td>-.317</td>
<td>26</td>
<td>.754</td>
</tr>
<tr>
<td>Swimming</td>
<td>1.077</td>
<td>26</td>
<td>.291</td>
</tr>
<tr>
<td>Moderate Sports</td>
<td>.149</td>
<td>26</td>
<td>.883</td>
</tr>
<tr>
<td>Household Activities</td>
<td>-1.077</td>
<td>26</td>
<td>.291</td>
</tr>
</tbody>
</table>
In addition, the parents/caregivers completed The Modifiable Activity Questionnaire for Adults. This questionnaire assessed physical activity over the past year. Also, the questionnaire asked how many hours participants watched television each day. Activities that were assessed included basketball, running, baseball, swimming, and football among other things. These were defined as leisure-time activities. Total leisure-time activity was calculated by hand based upon a formula that was provided in the questionnaire. The parents who completed the MAQ had a total of 5.16 hours/week of leisure-time activity, and the caregivers had a total of 3.44 hours/week of activity. The children with disabilities also provided MAQ data. Their leisure-time activity was assessed by using The Modifiable Activity Questionnaire for Children/Adolescents which is also a questionnaire that examines activities within the past year. The children with disabilities had a
total of .82 hours/week of leisure-time activity. The results indicated that as the parents were more physically active, the children with disabilities were less active.

Based on the responses from the MAQ data, the parents viewed an average of 2.64 hours/day of television, and the caregivers 3.125 hours/day. The MAQ for children also assessed television viewing for children. The children with disabilities viewed an average of 2.36 hours/day of television. The results indicated that as the parents watched more hours of television per week, the children with disabilities watched less hours of TV per week.

![Figure 5: MAQ Leisure Activity (Hours/Week)](image)

Hypothesis #3 states that the reported physical activity levels of the children with disabilities will be lower than nationally recommended guidelines. The Center for Disease Control recommends that all children engage in at least 60 minutes of physical activity each day.
This hypothesis was correct as the children with disabilities engaged in 7 minutes of activity each day. They totaled 49 minutes of activity each week.

Hypothesis #4 states that the reported physical activity levels of the parents/caregivers will be lower than nationally recommended guidelines. According to the Center for Disease control, adults should accumulate at least 30 minutes of physical activity each day, or 150 minutes/week. The parents accumulated 44 minutes of physical activity each day. The caregivers accumulated approximately 29 minutes each day. The parents had 310 minutes of activity each week; while the caregivers had 206 minutes of activity each week. As a result, hypothesis #4 is false, as the parents/caregivers met nationally recommended physical activity guidelines.

![Figure 6: MAQ Television Viewing (Hours/week)](image)

Also, the parents/caregivers completed The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD) on behalf of the children/adults with disabilities. This
questionnaire assessed activity over the past seven days, and evaluated leisure-time activity, household activity, and work-related activity. The questionnaire asked participants how often they participated in a specific activity over the past 7 days with the answers being never, seldom (1-2 days), sometimes (3-4 days), and often (5-7 days). The questionnaire also asked how many hours per day the participants engaged in these activities with the options being less than 1 hour, 1 but less than 2 hour, 2-4 hour, and more than 4 hour. The activities included stationary activities, walking, light and moderate sports, housework, home repairs, lawn work, caring for another person, and working as a volunteer. An independent samples t-test was performed between the children and adults with disabilities. A significant difference was found in light sport and recreational activities between the two groups (p=.027). There was also a significant difference found between heavy housework (p=.20), and volunteer hours (p=.048). There was no significant difference found between the type of disability that the adults with disabilities possessed and their physical activity levels. However, there was a significant difference found between the type of disability that the children with disabilities possessed and their activity levels (p=.042). The results from this data are shown below.
Figure 7: PASIPD Leisure Time Activity

Figure 8: PASIPD Leisure Time Activity Hours
**Figure 9:** PASIPD Household and Work-Related Activity

**Figure 10:** PASIPD Household and Work-Related Activity Hours
Table 6: *PASIPD t-test*

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Sport</td>
<td>-2.344</td>
<td>25</td>
<td>.027</td>
</tr>
<tr>
<td>Heavy Housework</td>
<td>2.485</td>
<td>25</td>
<td>.020</td>
</tr>
<tr>
<td>Volunteer Hours</td>
<td>2.077</td>
<td>25</td>
<td>.048</td>
</tr>
<tr>
<td>Disability of Children</td>
<td>-2.259</td>
<td>13</td>
<td>.042</td>
</tr>
</tbody>
</table>

**Aerobics Study and PASIPD**

An independent samples t-test was also used to compare the results from The Aerobics study to the results of the PASIPD. Significant differences were found between light, moderate and strenuous activities (p<.001, p=.000). The results from each survey were compared to each other. Light activities may include walking or jogging; moderate activities may include playing sports such as basketball or football, and strenuous activities may include heavy weight lifting. Hypothesis #1 states that there will be a significant difference between the activity levels of the parents/caregivers and the children/adults with disabilities. This hypothesis proved to be true. The individuals with disabilities obtained a higher frequency of light activities than the parents/caregivers. The mean for the parents was 1.5, while the mean for the individuals with disabilities was 5.9. The parents/caregivers had a mean of .29 for moderate activities, while the children/adults with disabilities had a mean of 3.0. The parents/caregivers displayed a mean of 0 for vigorous activities in the Aerobics study, while the individuals with disabilities had a mean of 2.9. An asterisk represents significance.
Table 7: Aerobics Study and PASIPD t-test

<table>
<thead>
<tr>
<th>Variable</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Activity</td>
<td>12.222</td>
<td>24</td>
<td>.000*</td>
</tr>
<tr>
<td>Moderate Activity</td>
<td>10.156</td>
<td>24</td>
<td>.000*</td>
</tr>
<tr>
<td>Vigorous Activity</td>
<td>6.501</td>
<td>24</td>
<td>.000*</td>
</tr>
</tbody>
</table>
CHAPTER V
SUMMARY & CONCLUSIONS

Summary

This study examined the physical activity levels between parents/caregivers and adults and children with disabilities. Thirteen caregivers and fifteen parents provided data. Thirteen adults with disabilities and fifteen children with disabilities were analyzed. The subjects were recruited from the Special Needs Activity Program at Indiana University of Pennsylvania. The parents/caregivers completed The Aerobics Center Longitudinal Study Physical Activity Questionnaire and The Modifiable Activity Questionnaire (MAQ) for adults. They also completed The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD), and The MAQ for Children on behalf of the children/adults with disabilities. The purpose of this study was to determine if these participants were meeting nationally recommended guidelines for physical activity, to compare the activity levels between the different types of disabilities, and to compare the parents/caregivers activity levels to the activity levels of the adults and children with disabilities.

Conclusions

SPSS computer software 17.0 was used to analyze the data. Subject demographics were established, then frequency tests were run between the surveys. The first hypothesis was that there would be a difference between the activity levels of the parents/caregivers and the children/adults with disabilities. Physical activity was divided into light activities, moderate activities, and strenuous activities. Light activities included walking and light jogging; moderate activities included participating in certain sports such as basketball and football, and strenuous activities included heavy weight lifting, among other things. This hypothesis was proven to be
true for all three activity types ($p<.001$, $p=.000$). The second hypothesis was that the physical activity of the children/adults with disabilities would be dependent upon the type of disability that they possess. This hypothesis proved to be false. A one-way ANOVA was used to determine this. There was only a significant difference found in walking ($p=.038$). The third hypothesis was that the reported physical activity levels of the children/adults with disabilities would be dependent upon the type of disability that they possess. This hypothesis proved to be false. A one-way ANOVA was used to determine this. There was only a significant difference found in walking ($p=.038$). The third hypothesis was that the reported physical activity levels of the disabled child will be lower than nationally recommended PA guidelines. It is recommended that children accumulate 60 minutes of physical activity each day. The children in this study accumulated 7 minutes a day of activity, and 49 minutes each week. The third hypothesis was proven to be true. The fourth hypothesis was that the reported physical activity levels of the parents/caregivers of the children/adults with disabilities will be lower than nationally recommended PA guidelines. This hypothesis was proven to be false. Adults should accumulate 30 minutes of physical activity a day or 150 minutes a week. The parents accumulated 44 minutes of physical activity each day. The caregivers accumulated approximately 29 minutes each day. The parents had 310 minutes of activity each week; while the caregivers had 206 minutes of activity each week.

**Limitations**

Limitations of this study were the sample size. Thirteen caregivers and fifteen parents provided complete data; while thirteen adults with disabilities and fifteen children with disabilities were analyzed. The participants were parents/caregivers and children/adults with disabilities who were involved in SNAP at IUP. None of the children or adults with disabilities were wheel-chair users. Future research may include studying individuals who are wheel-chair users as well. Future research may also include analyzing other types of disabilities. This study proved that the parents/caregivers did meet nationally recommended guidelines for physical activity. The children/adults with disabilities did not meet recommended physical activity
guidelines. This study was a paper and pencil study. The subjects completed physical activity surveys. Future research could be directed in performing hands-on lab work in this area. Specific human performance tests could be used to study this topic as well. Treadmill tests or bike tests may be possibilities to study this topic. Tests could be given to the parents/caregivers then to the children/adults with disabilities. Then these results could be analyzed to determine if there was a significant difference in activity between the two groups.
REFERENCES


APPENDICES

APPENDIX A

Name:

Number:

Parents/Caregivers Information

1. Name:
2. Age:
3. Marital Status:
   a. Single
   b. Married
   c. Divorced
   d. Widowed
4. Height and Weight:
5. How many days per week do you exercise?
   a. >5
   b. 3-5
   c. 1-2
   d. Never
6. How many minutes each exercise session?
7. What does your exercise routine consist of?
8. Are you employed: Yes/No
9. If yes, what is your job classification? Professional/Laborer
10. Do you have any physical limitations?

11. What is your highest level of education?
   a. Graduated high school
   b. Graduated college
   c. Advanced college degree (Master’s or Doctorate)
   d. Other

12. Description of your child’s disability:

13. Is your child wheel-chair bound? Yes/No

14. Does your child use assistive devices to move around (walkers or crutches) Yes/No
APPENDIX B

Children/Adolescents Information

1. Name:

2. Parent/Caregiver Name:

3. Age:

4. Height and Weight:

5. Description of Disability:

6. How many days per week do you exercise?

7. How many minutes per day do you exercise?

8. What are your exercise activities?

9. What grade are you currently in?
APPENDIX C

The Modifiable Activity Questionnaire for Adults

1. Please circle all activities listed below that you have done more than 10 times in the past year:
   - Jogging (outdoor, treadmill)
   - Swimming (laps, snorkeling)
   - Bicycling (indoors, outdoor)
   - Softball/Baseball
   - Volleyball
   - Bowling
   - Basketball
   - Skating (roller, ice, blading)
   - Martial Arts (karate, jujitsu)
   - Tai Chi
   - Calisthenics/Toning exercises
   - Wood Chopping
   - Water/coal hauling
   - Walking for exercise (outdoor, indoor, at mall or fitness center, treadmill)

   List each activity that you circled in the "Activity" box below, check the months you did each activity over the past year (12 months) and then estimate the average amount of time spent in that activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>J AN</th>
<th>F E B</th>
<th>M A R</th>
<th>A P R</th>
<th>M A Y</th>
<th>J U N</th>
<th>J U L</th>
<th>A U G</th>
<th>S E P</th>
<th>O C T</th>
<th>N O V</th>
<th>D E C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. In general, how many HOURS per DAY do you usually spend watching television?  
   [ ] hrs

3. Over this past year, have you spent more than one week confined to a bed or chair as a result of an injury, illness or surgery?  
   [ ] Yes______ [ ] No______  
   If yes, how many weeks over this past year were you confined to a bed or chair?  
   [ ] weeks

4. Do you have difficulty doing any of the following activities?  
   a. getting in or out of a bed or chair?  
      [ ] Yes______ [ ] No______  
   b. walking across a small room without resting?  
      [ ] Yes______ [ ] No______  
   c. walking for 10 minutes without resting?  
      [ ] Yes______ [ ] No______

5. Did you ever compete in an individual or team sport (not including any time spent in sports performed during school physical education classes)?  
   [ ] Yes______  
   If yes, how many total years did you participate in competitive sports?  
   [ ] yrs

6. Have you had a job for more than one month over this past year, from last _________ to this _________?

List all JOBS that the individual held over the past year for more than one month. Account for all 12 months of the past year. If unemployed/disabled/retired/homemaker/student during all or part of the past year, list as such and probe for job activities of a normal 8 hour day, 5 day week.

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Job Code</th>
<th>Min/Day</th>
<th>Mos/Yr</th>
<th>Day/Wk</th>
<th>Hrs/Day</th>
<th>Hrs Sitting</th>
<th>Check the category that best describes job activities when not sitting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A</td>
</tr>
</tbody>
</table>

**Category A**
(includes all sitting activities)

- Sitting
- Standing still w/o heavy lifting
- Light cleaning - ironing, cooking, washing, dusting
- Driving a bus, taxi, tractor
- Jewelry making/weaving
- General office work
- Occasional/short distance walking

**Category B**
(includes most indoor activities)

- Carrying light loads
- Continuous walking
- Heavy cleaning - mopping, sweeping, scrubbing, vacuuming
- Gardening - planting, weeding
- Painting/Plastering
- Plumbing/Welding
- Electrical work
- Sheep herding

**Category C**
(heavy industrial work, outdoor construction, farming)

- Carrying moderate to heavy loads
- Heavy construction
- Farming — hoeing, digging — mowing, raking
- Digging ditches, shoveling
- Chopping (ax), sawing wood
- Tree/pole climbing
- Water/coal/wood hauling

**JOB CODES**

- Not employed outside of the home:
  1. Student
  2. Home Maker
  3. Retired
  4. Disabled
  5. Unemployed

- Employed (or volunteer):
  6. Armed Services
  7. Office worker
  8. Non-office Worker

http://images.journals.lww.com/acsm-msse/Original.00005768-199706001-00015.TT31B.j... 2/10/2011
APPENDIX D

The Modifiable Questionnaire for Children

1. How many times in the past 14 days have you done at least 20 minutes of exercise hard enough to make you breathe heavily and make your heart beat fast? (Hard exercise includes, for example, playing basketball, jogging, or fast bicycling; include time in physical education class)
   ( ) None
   ( ) 1 to 2 days
   ( ) 3 to 5 days
   ( ) 6 to 8 days
   ( ) 9 or more days

2. How many times in the past 14 days have you done at least 20 minutes of light exercise that was not hard enough to make you breathe heavily and make your heart beat fast? (Light exercise includes playing basketball, walking or slow bicycling; include time in physical education class)
   ( ) None
   ( ) 1 to 2 days
   ( ) 3 to 5 days
   ( ) 6 to 8 days
   ( ) 9 or more days

3. During a normal week how many hours a day do you watch television and videos, or play computer or video games before or after school?
   ( ) None
   ( ) 1 hour or less
   ( ) 2 to 3 hours
   ( ) 4 to 5 hours
   ( ) 6 or more hours

4. During the past 12 months, how many team or individual sports or activities did you participate in on a competitive level, such as varsity or junior varsity sports, intramurals, or out-of-school programs.
   ( ) None
   ( ) 1 activity
   ( ) 2 activities
   ( ) 3 activities
   ( ) 4 or more activities

What activities did you compete in?
List each activity that you checked above in the "Activity" box below.
Check the months you did each activity and then estimate the amount of time spent in each activity.

<table>
<thead>
<tr>
<th>Activity</th>
<th>J</th>
<th>F</th>
<th>M</th>
<th>A</th>
<th>M</th>
<th>J</th>
<th>J</th>
<th>A</th>
<th>G</th>
<th>O</th>
<th>N</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aerobics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Band Drill Team</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baseball</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basketball</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bowling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cheerleading</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dance Class</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Football</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Garden/Yard Work</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Months per Year: 12, Days per Week: 5, Minutes per Day: 60*

http://images.journals.lww.com/aesm-msse/Original.00005768-199706001-00016.TT35Bj... 2/10/2011
APPENDIX E

The Aerobics Study Longitudinal Physical Activity Questionnaire

**Name:**

**Number:**

**The Aerobics Center Longitudinal Study Physical Activity Questionnaire**

In this section we would like to ask you about your current physical activity and exercise habits that you perform regularly, at least once a week. Please answer as accurately as possible. Circle your answer or supply a specific number when asked.

**Exercise/Physical Activity**

1. For the last 3 months, which of the following moderate or vigorous activities have you performed regularly? (Please circle YES for all that apply and NO if you do not perform the activity; provide an estimate of the amount of activity for all marked YES. Be as complete as possible.)

**Walking**

NO YES→ How many sessions per week?

How many miles (or fractions) per session?

Average duration per session? (minutes)

What is your usual pace of walking? (Please circle one)

| CASUAL or STROLLING (<2mph) | AVERAGE or NORMAL (2 to 3 mph) | FAIRLY or BRISK (3 to 4 mph) | BRISK or STRIDING (4 mph or faster) |

**Stair Climbing**

NO YES→ How many flights of stairs do you climb UP each day? (1 flight=10 steps)

**Jogging or Running**

NO YES→ How many sessions per week?

How many miles (or fractions) per session?

Average duration per session? (minutes)
Treadmill
NO
YES → How many sessions per week?
Average duration per session? (minutes)
Speed? (mph)    Grade? (%)  

Bicycling
NO
YES → How many sessions per week?
How many miles per session?
Average duration per session? (minutes)

Swimming Laps
NO
YES → How many sessions per week?
How many miles per session? (880 yds = 0.5 miles)
Average duration per session? (minutes)

Aerobic Dance/Calisthenics/Floor Exercise
NO
YES → How many sessions per week?
Average duration per session? (minutes)

Moderate Sports
(e.g. Leisure volleyball, golf, social dancing, tennis)
NO
YES → How many sessions per week?
Average duration per session? (minutes)

Vigorous Racquet Sports
(e.g. Racquetball, singles tennis)
NO
YES → How many sessions per week?
Average duration per session? (minutes)

Other Vigorous Sports or Exercise Involving Running (e.g. Basketball, soccer)
NO
YES → Please specify:
How many sessions per week?
Average duration per session? (minutes)

Other Activities
NO    YES→ Please specify:
      How many sessions per week?
      Average duration per session? (minutes)

Weight Training (Machines, Free Weights)
NO    YES→ How many sessions per week?
      Average duration per session? (minutes)

Household Activities (Sweeping, vacuuming, washing clothes, scrubbing floors)
NO    YES→ How many hours per week?

Lawn Work and Gardening
NO    YES→ How many hours per week?

2. How many times a week do you engage in vigorous physical activity long enough to work up a sweat? (times per week)
APPENDIX F

The Physical Activity Scale for Individuals with Physical Disabilities (PASIPD)

Instructions: This questionnaire is about your current level of physical activity and exercise. Please remember there are no right or wrong answers. We simply need to assess your current level of activity.

Leisure Time Activity

1. During the past 7 days how often did you engage in stationary activities such as reading, watching TV, computer games, or doing handicrafts?
   1. Never (Go to question #2)
   2. Seldom (1-2d)
   3. Sometimes (3-4d)
   4. Often (5-7d)

What were these activities?

On average, how many hours per day did you spend in these stationary activities?
   1. Less than 1 hr
   2. 1 but less than 2 hr
   3. 2-4 hr
   4. More than 4 hr

2. During the past 7 days, how often did you walk, wheel, push outside your home other than specifically for exercise. For example, getting to work or class, walking the dog, shopping, or other errands?
   1. Never (Go to question #3)
   2. Seldom (1-2d)
   3. Sometimes (3-4d)
   4. Often (5-7d)

On average, how many hours per day did you spend walking, wheeling or pushing outside your home?
   1. Less than 1 hr
   2. 1 but less than 2 hr
   3. 2-4 hr
   4. More than 4 hr

3. During the past 7 days, how often did you engage in light sport or recreational activities such as bowling, golf with a cart, hunting or fishing, darts, billiards or pool, therapeutic exercise (physical or occupational therapy), or other similar activities?
   1. Never (Go to question #4)
   2. Seldom (1-2d)
   3. Sometimes (3-4d)
   4. Often (5-7d)
What were these activities?

On average, how many hours per day did you spend in these *light sport or recreational* activities?
1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr

4. During the past 7 days, how often did you engage in *moderate sport and recreational* activities such as doubles tennis, softball, golf without a cart, ballroom dancing, wheeling or pushing for pleasure or other similar activities?
1. Never (Go to question #5)
2. Seldom (1-2d)
3. Sometimes (3-4d)
4. Often (5-7d)

What were these activities?

On average, how many hours per day did you spend in these *moderate sport or recreational* activities?
1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr

5. During the past 7 days, how often did you engage in *strenuous sport and recreational* activities such as jogging, wheelchair racing (training), off-road pushing, swimming, aerobic dance, arm cranking, cycling (hand or leg), singles tennis, rugby, basketball, walking with crutches and braces, or other similar activities?
1. Never (Go to question #6)
2. Seldom (1-2d)
3. Sometimes (3-4d)
4. Often (5-7d)

What were these activities?

On average, how many hours per day did you spend in these *strenuous sport or recreational* activities?
1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr
6. During the past 7 days, how often did you do any exercise specifically to increase muscle strength and endurance such as lifting weights, push-ups, pull-ups, dips, or wheelchair pushups, etc?

1. Never (Go to question #7)
2. Seldom (1-2d)
3. Sometimes (3-4d)
4. Often (5-7d)

What were these activities?

On average, how many hours per day did you spend in these exercises to increase strength and endurance?

1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr

**Household Activity**

7. During the past 7 days, how often have you done any light housework, such as dusting, sweeping floors or washing dishes?

1. Never (Go to question #8)
2. Seldom (1-2d)
3. Sometimes (3-4d)
4. Often (5-7d)

On average, how many hours per day did you spend doing light housework?

1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr

8. During the past 7 days, how often have you done any heavy housework or chores, such as vacuuming, scrubbing floors, washing windows, or walls, etc?

1. Never (Go to question #9)
2. Seldom (1-2d)
3. Sometimes (3-4d)
4. Often (5-7d)

On average, how many hours per day did you spend doing heavy housework or chores?

1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr
9. During the past 7 days, how often have you done *home repairs* like carpentry, painting, furniture refinishing, electrical work, etc?
   1. Never (Go to question #10)
   2. Seldom (1-2d)
   3. Sometimes (3-4d)
   4. Often (5-7d)

On average, how many hours per day did you spend doing *home repairs*?
   1. Less than 1 hr
   2. 1 but less than 2 hr
   3. 2-4 hr
   4. More than 4 hr

10. During the past 7 days how often have you done *lawn work or yard care* including mowing, leaf or snow removal, tree or brush trimming, or wood chopping, etc?
    1. Never (Go to question #11)
    2. Seldom (1-2d)
    3. Sometimes (3-4d)
    4. Often (5-7d)

On average, how many hours per day did you spend doing *lawn work*?
    1. Less than 1 hr
    2. 1 but less than 2 hr
    3. 2-4 hr
    4. More than 4 hr

11. During the past 7 days, how often have you done *outdoor gardening*?
    1. Never (Go to question #12)
    2. Seldom (1-2d)
    3. Sometimes (3-4d)
    4. Often (5-7d)

On average, how many hours per day did you spend doing *outdoor gardening*?
    1. Less than 1 hr
    2. 1 but less than 2 hr
    3. 2-4 hr
    4. More than 4 hr

12. During the past 7 days, how often did you *care for another person* such as children, a dependent spouse, or another adult?
    1. Never (Go to question #13)
    2. Seldom (1-2d)
    3. Sometimes (3-4d)
    4. Often (5-7d)
On average, how many hours per day did you spend caring for another person?
1. Less than 1 hr
2. 1 but less than 2 hr
3. 2-4 hr
4. More than 4 hr

**Work-Related Activity**

13. During the past 7 days, how often did you work for pay or as a volunteer? (Exclude work than mainly involves sitting with slight arm movement such as light office work, computer work, light assembly line work, driving a bus or van, etc)
   1. Never (Go to END)
   2. Seldom (1-2d)
   3. Sometimes (3-4d)
   4. Often (5-7d)

On average, how many hours per day did you spend working for pay or as a volunteer?
1. Less than 1 hr
2. 1 but less than 4 hr
3. 5 but less than 8 hr
4. 8 hr or more

**Reference:**