

Do Physically Active Parents of Preschool Aged Children have Physically Active Children?

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Lack of physical activity is a leading cause of childhood obesity. For this study, children between the ages of 3-to-6 years-old were observed in a childcare setting during their normal playtime. Children had the opportunity to choose from 2 sedentary activities and 2 physical activities. Observations were carried out to investigate the choices made over a 20-minute period. Height and weight measurements were collected and one-on-one interviews were conducted with each child using flash cards to assess children's preferences for different activities. Parent questionnaires were used to gather data from parents on their own physical activity levels and their children's overall physical activity levels. We hypothesized that will be tested is that children with parents that engage in high levels of physical activity would be more likely to have children that take part in physical versus sedentary activities in a childcare setting compared to children with parents with lower levels of participation in physical activity.

INTRODUCTION

Understanding what motivates children to take part in moderate to vigorous physical activity will help researchers to develop programs to increase children's participate in physical activity (Kimiecik, Horn, & Shurin, 1996). The structural and environmental features of a community relates to physical activity levels in which a family can engage in (Soubhi, Potvin, & Paradis, 2004). Peers, communities, coaches, teachers, school, media, and families are all involved in determining children's physical activity behavior (Anderssen & Wold, 1992; Kimiecik, Horn, & Shurin, 1996). The role of the family is most essential, because children grow up in the family environment for many years, providing an opportunity for parents to influence their children's behaviors (Kimiecik, Horn, & Shurin, 1996). In addition to the family environment, area of residence influences physical activity (Soubhi, Potvin, & Paradis, 2004).

Since physical activity behaviors that are learned by children may persist into adulthood (Gustafson & Rhodes, 2006), parents that instill healthy behaviors in their children at a young age will make a difference in their child's life as he or she ages. Children learn by observing individuals in the environment in which they are surrounded. Parents and

siblings serve as the most important behavioral role model in early childhood (Sallis, 2000). A moderate predictor of short and long term health of children is physical activity (Gustafson & Rhodes, 2006). Sedentary activities are replacing physical activities and promoting children to have more structured activities, hence, causing children to become less active. Parents of young children have some control over the types of activities that their children engage in, as parents are usually responsible of determining how children spend their time.

To study children's physical activity levels it is important to study their parents, because it is assumed that active parents have active children (Pan, Frey, Bar-Or, & Longmuir, 2005) (Sallis, Prochaska, & Taylor, 2000). The activity patterns of parents correlate with those of their preschool school-aged children (Irwin, He, Bouck, Tucker, & Pollett, 2005). Children that engage in more physical forms of activity will reduce their chances of becoming obese. Parents' physical activity levels may be important in modifying children's physical activity and in treating pediatric obesity (Kalakanis, Goldfield, Paluch, & Epstein, 2001).

Recent studies suggest that overweight parents tend to have overweight children (Davison & Birch, 2002). Childhood obesity is determined by genetic predisposition, dietary intake and energy expenditure (Irwin, He, Bouck, Tucker, & Pollett, 2005). Families show similarities in behavioral risk factors associated with obesity which include physical activity (Davison & Birch, 2002) (Anderssen & Wold, 1992; Freedson & Evenson, 1991; Moore et al., 1991; Sallis, Patterson, McKenzie, & Nader, 1988) (Wold & Anderssen, 1992). Because parents' and their children's activity levels are related (Kalakanis, Goldfield, Paluch, & Epstein, 2001), families can be successful in shaping healthy behaviors in the members of their family (Soubhi, Potvin, & Paradis, 2004) (Sallis et al., 1993).

Developmental changes during youth include substantial declines in physical activity with age (Sallis, Taylor, Dowda, Freedson, & Pate, 2002). Family influence on youth participation in physical activity decreases with age while the influence of physical activity from a peer increases with age (Sallis, Taylor, Dowda, Freedson, & Pate, 2002). Un addition, after-school recreation is associated with more physical activity than sedentary activity (Sallis, Taylor, Dowda, Freedson, & Pate, 2002). It is essential for parents to encourage their children to become involved in sports and recreation in order to gain some control over the type of activities that their children engage in.

Most children in the United States are enrolled in school or some form of childcare which provides ongoing contact to study activities that children participate in (Stolley et al., 2003). Parents that send their children to licensed daycare programs feel that their child receives a routine physical activity experience (Irwin, He, Bouck, Tucker, & Pollett, 2005). However, through observations researchers found that children that are in childcare settings are engaged in both physical activity and structured sedentary activities. Children are limited to the scheduled physical activity they can engage in while in childcare. When children in childcare settings are given the opportunity to take part in

activities, some children will choose physical activities and some will choose sedentary activities.

The purpose of the present study was to assess associations between parents' physical activity levels and that of their children. The study investigated children's reported activity preferences and observations of children's physical activity in a childcare setting. This paper will explain the importance of prevention programs to reduce the chances of children becoming obese.

METHODS

Participants

Participants consisted of 51 three to six- year-old African American, Caucasian, and Asian boys and girls and their parents. Eligibility criteria for each boy and girl included a child, three to six years old that had the ability to be physically active. Parents were required to complete questionnaires providing information about their family background, their own activities, and their children's activities at home. Families were recruited during multiple visits to childcare centers with posters advertising the study, information explaining the study, and consent forms.

Measures

Family Background. Parents provided information on several background and demographic variables, including combined family income, parental education and family history of disease.

Child Activity Preferences. Children's preferences for physical activity were measured using (1) a behavioral observation procedure (2) a pictorial rating system. We used a 20-minute behavioral observation protocol was used to rate children's preferences for standard sedentary activities such as reading and listening to a book on tape, and children's preferences for moderate to vigorous physical activities such as jumping rope and dancing along to music. Children were able to choose from 4 activities (2 sedentary, 2 active) during this 20-minute period. Trained research assistants observed and rated the choices children made during activity time and the length of time they participate in each activity. Lastly, children were asked to view pictures of several different activities ranging from very sedentary (e.g. reading or watching television), to very vigorous (e.g. swimming or running around outside) and rated their preference for that activity on a scale of 1 (do not like) to 3 (really like).

Parents' Physical Activity Level. The amount of time parents have spent being physically active in the last 7 days were assessed using the International Physical Activity Questionnaire (IPAQ) developed by Craig and colleagues (Craig et al., 2003). The measure consisted of 7 items pertaining to job-related physical activity (i.e. *During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, heavy construction, or climbing up stairs as part of your work?*), 6 items related to transportation physical activity (i.e. *During the last 7 days, on how many days did you travel in a motor vehicle like a train, bus, or car?*), 6 items related to housework, house maintenance, and caring for family activity (i.e. *During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, chopping wood, shoveling snow, or digging in the garden or yard?*), 6 items related to recreation, sport and leisure time physical activity (i.e. *During the last 7 days, on how many days did you do vigorous physical activities like aerobics, running, fast bicycling, or fast swimming in your leisure time?*), and 2 items on time spent sitting (i.e. *During the last 7 days, how much time in total did you usually spend sitting on a weekday?*). Activities are defined as either vigorous or moderate, vigorous being those activities that take hard physical effort and make breathing much harder than normal and moderate being those activities that take some physical effort and make breathing somewhat harder than normal. Scoring was based upon the time spent involved in each type of activity.

Procedure

Prior to making the childcare center visits, the Family Health Study research team obtained permission from the directors of each center. The study was approved by the Institutional Review Board. The team met with teachers and parents to give a brief overview of the study. Parents provided written consent for their child prior to data collection. Visits were made to the childcare centers on 6 different occasions. The first two visits consisted of observations that were made to investigate the children's activity choices made over a 20- minute period. The third visit was to drop off 2 sedentary activities and 2 physical activities after introducing each activity to the children. The 2 sedentary and 2 physical activities were in the childcare centers for a 1-week acclimation period before the research team began making observations. During the fourth and fifth visits, observations were conducted to investigate children's activity choices made over a 20-minute period after new activities were placed in the childcare centers. On the last visit, height, weight, and bioimpedance measurements were collected. To gain more knowledge about activity preferences of children, a one-on-one interview was conducted using flash cards to rate different activities.

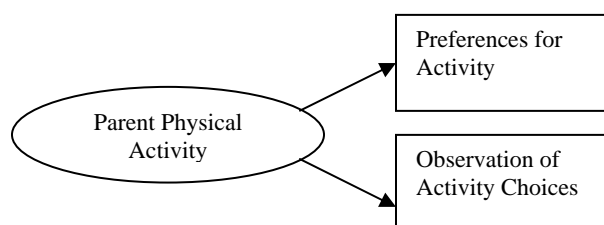
The study was conducted in the Child Development Laboratory and the Bennett Family Childcare Center at The Pennsylvania State University. The Activity Choices in Youth Study was completed during the summer of 2006 by the Family and Child Health Laboratory research team.

RESULTS

Statistical Analyses

Descriptive statistics were used to describe the variables of interest in this study. Multiple regressions were used to test the hypothesis that parents' physical activity level is associated with children's activity preferences. Outcome variables of interest include (1) children's activity preferences measured by the pictorial rating system and (2) children's activity choices measured using the behavioral observation in the childcare setting. Figure 1 outlines the conceptual model that will be tested in this study.

Figure 1. Conceptual Model



Descriptive Statistics

The parents in the study had an income level above \$50,000, had fourteen years plus of education, had a two-parent family household, and were over the age of 30. Descriptive statistics for children's pre-toys and post-toy observations, activity level, and activity choices appear in Table 1. On average most children reported a high preference for sedentary, moderate, and vigorous activities on the pictorial measure, and participated in slow, easy movement level activities during the observations.

Table 1. Mean levels of children's pre-toys and post-toy observations, including activity level and activity choices

Variable	B	Mean	SD	Range
Pre-Toys Activity Level	48	2.3	.23	1.6 - 2.9
Post-Toys Activity Choice	48	2.8	.59	1.5 - 3.8
Pre-Toys Activity Level	48	2.5	2.0	2.0 - 3.8
Post-Toys Activity Choice	46	2.9	1.0	1.0 - 4.1

Note. Activity level refers to the level of energy expended (1=no movement, 4=fast, vigorous movement). Activity choice refers to the type of activity children chose (1=sedentary activity, 4=vigorous activity). SD = standard deviation

Parents' Physical Activity Level

Descriptive information on parents' physical activity level appears in Table 2. Fathers reported slightly higher levels on all activity variables compared to mothers, apart from walking; mothers reported slightly higher levels of walking than fathers. Mothers and

fathers reported participating in vigorous and moderate forms of physical activity approximately 2 days each week. Mothers reported walking approximately 4 days each week, while fathers reported walking approximately 3 days each week. Both mothers and fathers reported sitting for approximately 7 hours each day.

Table 2. Mothers' (N = 27) and fathers' (N = 24) mean levels of physical activity.

Variable	<u>MOTHERS</u>		<u>FATHERS</u>	
	Mean	SD	Mean	SD
Vigorous Activity (days/week)	1.6	1.6	2.0	2.2
Vigorous Activity (minute/session)	53.7	25.9	94.1	57.9
Moderate Activity (days/week)	2.1	2.4	2.3	2.3
Moderate Activity (minute/session)	45.0	28.5	52.9	33.3
Walking (days/week)	4.2	3.0	3.1	2.6
Walking (minutes/day)	50	40.7	62.1	62.9
Sitting (minutes/day)	409.5	130.7	440.6	197.7

Parents' Influence on Children's Physical Activity

Correlations among parent and child variables appear in Table 3. Mothers that reported engaging in vigorous activities had children that engaged in physical activity in their normal childcare setting during pre-toy observations. In the childcare setting, children's pre-toy activity level was correlated with their mothers' activity levels. There was a trend for mothers' moderate physical activity level to be correlated with children's reported preference for vigorous activity. We did not find any other activities with moderate and sedentary activities.

Among fathers, fathers who reported higher levels of moderate physical activity had children who reported a higher preference for vigorous physical activity. There were no other relationships between fathers' and children's physical activity.

Table 3. Correlations among parent and child physical activity variables

Variable	N	Child Preference for Vigorous Activity	Child Pre-Toy Activity Level
Mothers' vigorous activity (days/week)	26	NS	.40*
Mothers' moderate activity (days/week)	24	.34†	NS
Mothers' walking (days/week)	18	.40†	NS
Fathers' moderate activity (days/week)	13	.56*	NS

*p ≤ .05, †p < .10 (trend)

DISCUSSION

The primary goal of this study was to determine whether children with parents that engage in high levels of physical activity were more likely to have children that take part in physical versus sedentary activities in a childcare setting compared to children whose parents had lower levels of participation in physical activity. The hypothesis was supported by mother's moderate activity level correlating with their children's vigorous activity levels. The results of the study indicate that when both parents are physically active, their children are as well. However, the small sample size for this study may decrease the generalizability of the results.

In examining the relationship between parents and their preschool-aged children's physical activity levels, this study determined that children's physical levels correlate with their parents' physical activity levels. Mothers that engage in vigorous activities have children that participated in more physical activities in the childcare setting during pre-toy observations. This data indicated that mothers that reported daily vigorous activities may be role models for their children in the home and the behavior is put to use in the childcare centers.

In the literature the association between physical activity levels and children is influenced by family, communities, teachers, coaches, peers, and media. Family is the most influential of all. Parents and siblings are role models to children in fostering healthy behaviors during early childhood. It is important for parents to introduce healthy physical activity behaviors to their children at a very early age. Because children grow up in a home environment for many years, it is essential that parents influence their children's choices in different activities.

By replacing some of the sedentary and physical activities in each childcare center it gave children the opportunity to choose from different activities from those normally found in their childcare setting. The approach that was implemented gave the Family and Child Health Laboratory research team a better understanding of which activities children are more likely to participate in. The new styles and structures of the sedentary activities are what captured young children's eyes. When debating between using a physical activity or an interactive book, children preferred sedentary activities that were fun and easy to use.

Most children are not always given the opportunity to go outside and be active. Sedentary activities can be of use when the space is limited inside. However, activities that promote physical activity are best for a child's overall health and development. It is important for parents to promote activities for their children that are educational and healthy. In the home, a child should have access to and be able to choose from as many physical activities as sedentary activities. One limitation of this study was not being able to observe children and their parents at their home to see if what was self-reported about their physical activity levels was true.

Parents that engage in high levels of physical activity should participate in high levels of physical activities with their children. Parents that have their children involved in sports and recreational activities at a young age will allow children to get used to being physically active into adulthood and reduce their children's chances of becoming obese. Parents that are overweight tend to have children that are overweight as well. If being physically active is a way to keep a child living happy and healthy and avoiding childhood obesity it is worth it. An additional limitation of this study was that it relied solely on self-reported measures of parents' physical activity levels. The parent physical activity levels were measured using an International Physical Activity Questionnaire (IPAQ). Another limitation of this study was not being able to observe children in an outdoor environment. Even though the study was limited to indoor environment it allowed the opportunity to explore more activities that children are more likely to engage in when they are inside.

RECOMMENDATIONS

Recommendations for further studies most consider implementing activities that will give children in childcare settings the opportunity to be more physically active. When considering a childcare setting to observe, consider the supportive environment. It is important to study with a center that has a supportive staff. It is especially essential to examine a childcare center that has both physical activities and sedentary activities available for children to engage in. Focus on the childcare environment and the amount of space that is available for a child to engage in physical activity and the time observations are conducted. Therefore, future research must consider parents as a key factor in finding modeling healthy behaviors and encouraging their children to participate in more physical activities versus sedentary activities.

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