

Investigating the Attitudes of Pre-Service Early Childhood Educators Concerning Their Attitudes toward Physical Activity in the Early Years

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Abstract

Children who participate in vigorous physical activity experience greater gains in academic, physical and social growth. However, children today increasingly experience a sedentary lifestyle rather than an active one. Changing this trajectory requires that teachers and administrators in schools and child care settings create opportunities for physical activity for young children. This study examines the attitudes of pre-service early childhood teachers' toward physical activity among young children in early childhood school settings. A survey was conducted among undergraduate early childhood classes. Results of this survey are discussed in terms of teacher preparation programs and benefits of physical activity for children.

Introduction

The benefits of vigorous physical activity in the early years of a child's life extend beyond the school years and well into the adult's life (Abadie & Brown, 2010; Schachter, 2011). In fact, participating in temperate to dynamic physical activity at a very young age is crucial for health, wellness, and better cognitive functioning in all phases of the life span (Wadsworth, 2012; Abadie & Brown, 2010; Schachter, 2011; National Scientific Council on the Developing Child, 2006; Kramer & Erickson, 2007).

However, today, children are becoming less active as they spend more time watching the television or engaged with the computer. This sedentary lifestyle is even more pronounced when one considers that children are less likely to walk to school and are more likely to travel in cars than they were in the early 1970s (Anderson & Butcher, 2008).

In order to instill a more active lifestyle, children must be educated at a young age about physical activity and exercise, as well as be given plenty of opportunities to participate in physical activity (Abadie & Brown, 2010). This will require a shift in attitudes and practices among those who are closest to young children (i.e. families, caregivers, and teachers).

Literature Review

Several indicators have been noted that are influenced by the lack of physical activity among young children. These factors, solutions, and barriers are described below.

Academic Indicators

Current evidence suggests that there may be a link between lack of physical activity in young children and an inability to perform at the highest academic levels (Wittberg, et al., 2010; Fox, et al., 2010; Welk, et al., 2010).

Results from the International Mathematics and Science study (TIMMS) and the Progress in International Reading Literacy Study (PIRLS) reveal a satisfactory ranking among developed countries but less than stellar ranking among the highest ranking countries. (National Center for Educational Statistics, 2010; U. S. Department of Education, 2013).

It appears that progress has been made in the younger years; however, as children age the scores decrease, painting a picture of students who may not be able to compete on an international level during their adult years. The lack of overall progress on the academic measures presented and the decline in physical activity, indicate a possible link between the two.

Physical Indicators

According to the Centers for Disease Control and Prevention (CDC), obesity affects 17 percent of all children and adolescents in the United States. This is triple the rate from one generation ago. Obesity is defined as body mass index (BMI) for age and sex at or above the 95th percentile of the CDC growth charts, and overweight is defined as BMI for age and sex from the 85th up to the 95th percentile of the CDC growth charts (Ogden et al., 2008). Today the number of obese children is increasing in the United States. Between 1988-1994 and 1999-2000 the percentage of obese children increased for all age groups (Ogden et al., 2008). The number of preschoolers who meet overweight status criteria in the United States has increased in the last 30 years from five percent to 12.4 percent (Derscheid et al., 2010). Approximately 17 percent, 12.5 million, of children between the ages of two and nineteen years old are obese (Ogden et al., 2008). Changes in children's physical activity and diet have been proven to increase the likelihood of obesity today (Danner, 2008; Gortmaker, 1990; McMurray et al, 2000).

According to the CDC, obesity in children and adolescents age two to nineteen has grown from three percent in 1970 to 16.9 percent in 2008. Each year has revealed a progressive increase. From 1970 to 2008, the percentage of obesity in two to five year olds has increased from three percent to 10.4 percent. In this same time period obesity in six to eleven year olds has increased from 4.2 percent to 19.6 percent. In children ages 12-19 years old obesity has accelerated from 4.6 percent to 18.1 (Ogden & Carroll, 2010).

For every age group, ethnicity, and gender, obesity has also had a progressive increase over the past twenty-five years. Between 1988-1994 and 2007-2008, obesity in non-Hispanic white boys grew from 11.6 percent to 16.7 percent. In this same time frame, obesity in non-Hispanic black boys has expanded from 10.7 percent to 19.8 percent. For Mexican-American boys obesity almost doubled from 14.1 percent to 26.8 percent. Between 1988-1994 and 2007-2008 obesity in non-Hispanic white girls has increased from 8.9 percent to 14.5 percent. In this same time frame, obesity in non-Hispanic black girls grew from 16.3 percent to 29.2 percent. For Mexican-American girls obesity has increased from 13.4 percent to 17.4 (Ogden & Carroll, 2010).

Benefits of Early Physical Activity

Early development of physical activity has been shown to help increase physical activity in later stages of life (Abadie & Brown, 2010). In addition, vigorous physical activity can increase academic achievement and cognitive control (Fox et al., 2010; Wittberg et al., 2010; Welk et al., 2010; Hillman et al., 2009; National Scientific Council on the Developing Child., 2006; Kramer & Erickson, 2007). Activities, such as recess, have shown not only to positively affect children's health and physical development, but their brain development, attention, memory, social and emotional adjustment, language development, and manners in the classroom (Waite-Stupiansky & Findlay, 2001). Moreover, physical activity protects against the development of neurodegenerative diseases (Kramer & Erickson, 2007) and may even build a neural reserve against brain disorders (Gomes et al., 2011). Finally, physical activity can be used to help manage diabetes and is considered as one of the main ways to prevent diabetes (Tompkins et al., 2009).

Physical activity also has many benefits that will impact children for the rest of their lives. Physical education and sports have been shown to help develop children's fundamental movement skills and physical capabilities. In addition, when presented appropriately by teachers, parents and coaches, physical education and sports can support the progress of social skills, social behaviors, self-esteem, and attitudes about school (Bailey, 2006.).

Nutrition and Physical Activities

The amount of calories consumed by a person and the amount of calories burned is vitally important (Corbin & Pangrazi, 2004). Research has shown that food patterns for children, especially in adolescence, can determine

their future dietary preferences and eating behavior as adults. In addition, evidence also shows that an unhealthy diet and lack of physical activity during childhood can lead to problems in adulthood such as, heart disease, obesity, type 2 diabetes, osteoporosis, and some types of cancer (Weichselbaum & Buttriss, 2011). The amount of nutrition a child needs correlates with their size and physical activity level. Data from the *National Diet and Nutrition Surveys* (NDNS) showed that boys and girls in the older age group had low intakes of almost all minerals and vitamin A. A low intake of zinc was clear for the younger age group of children. Results from the *Low Income Diet and Nutrition Survey* (2003-2005) and the 1997 NDNS showed that children from low-income families usually have more whole milk, fat spreads, meat and processed meats, and non-diet soft drinks compared to other children from the general population (Weichselbaum & Buttriss, 2011).

For children to achieve optimal health, they need to eat healthy and be physically active. Young children are naturally more active than adults, and this natural inclination to be active drops dramatically in the teen years. If children are given the chance to be active, they will do so. Therefore, adults must make sure that children are given these opportunities. If active opportunities decrease for children, so will physical activity for people of all ages (Corbin & Pangrazi, 2004). People who believe they can be successful in physical activity are more likely to be active. Therefore, it is imperative to build confident feelings towards activity in young children (Corbin & Pangrazi, 2004).

Elementary Schools and Physical Activity

Students in the United States spend an average of 886 hours in school per school year (Center for Public Education, 2013). This large amount of time necessitates daily physical activity within the school setting (Corbin & Pangrazi, 2004). However, only four percent of elementary schools, eight percent of middle and junior high schools, and two percent of high schools provide daily physical education to students (Story, Nanny, & Schwartz, 2009). Administrators and teachers can enhance physical activity in their school through three major strategies: (1) individualize activities and feedback for students, (2) enhance role models of physical activity, and (3) focus on life-long physical skills that students can utilize throughout their life. These strategies are described below.

First, it is suggested that schools individualize activities and feedback so that all students have opportunities to take part and excel in many different kinds of physical activity. If children are not able to perform certain activities or exercises, they are less likely to enjoy exercise and more likely to have a negative attitude towards physical activity (Corbin & Pangrazi, 2004). Often teachers only reinforce students who score the highest, run fastest, or do the most repetitions of exercises. However, this practice overlooks students who are trying their best, but are not achieving a predetermined standard. Individualized support and feedback creates an atmosphere of encouragement that promotes physical activity and positive attitudes about physical activity. Students who feel valued will more likely take part in the overall physical education program (Corbin & Pangrazi, 2004).

Second, it is very important for teachers and other adults at the school to be positive, active role models for children. Teachers need to take the time to tell students about how they choose to be active and what benefits they reap from it. Teachers should not just talk about being active to students; they need to live that way as well (Corbin & Pangrazi, 2004).

Third, administrators and teachers must integrate physical activities within the daily program that children can do for the rest of their lives into adulthood. Activities such as hiking, walking, jogging, and biking are areas of fitness that children are more likely to participate in through adulthood. At times teachers need to implement activities that are not competitive, can be done alone, promote enjoyment, and activities that help the children feel successful (Corbin & Pangrazi, 2004).

Physical Activity Pyramid Model

The Physical Activity Pyramid (Corbin & Pangrazi, 2004) is a tool created to enable providers a plan for appropriate physical education experiences for young children. The pyramid is developed around four levels with an emphasis on planning a wide range of activities throughout the child's day. (See Figure 1)

Level 1 describes everyday activities that children pursue. Level 2 describes vigorous activities including aerobics and sports and recreation. Level 3 highlights exercises that promote flexibility and muscle fitness. Level 4 consists of inactivity or sedentary living.

Barriers to Physical Activity

The literature reveals at least four barriers to physical activity for children today. These include issues such as gender, scheduling, family motivation, and child care practice.

First, it is noted that a barrier to physical activity in young children can be their gender. Preschool girls take part in much less total physical activity and moderate-to-vigorous physical activity than preschool boys. On weekdays, boys take part in approximately 155.4 minutes of physical activity, while girls only take part in about 128.22 minutes. During the weekend, boys spent 111.2 minutes of physical activity compared to 90.5 minutes for girls (Vale, et al., 2010).

Second, situational factors such as a weekly schedule, geographic living areas, or child-care arrangements can contribute to variations of physical activity for children (Vale et al., 2010). For instance, children are able to be more physically active during the week while they are at daycare or school than they are on weekends when they are at home. In addition, students from urban areas have the lowest levels of physical activity (Beth, Molnar, Gortmaker, Bull, & Buka, 2004). Moreover, half-day preschool programs are linked with more obese children than full day programs (Frisvold & Lumeng, 2011).

Third, there appears to be personal and family characteristics that lead to inactivity. For instance, some people have trouble providing a place for children to take part in physical activity due to financial restrictions, time, or motivation. When adults do not make physical activity a priority in their own life, it does not become a priority for their children (Riethmuller et al., 2009).

Fourth, many daycare providers assert the value of physical activity for young children. However, this interest does not positively correlate with increased physical activities planned for young children (Riethmuller et al., 2009).

Methodology

Research Question

Physical activity among young children can be increased by helping teachers develop positive attitudes about physical activity in the early years and by increasing their personal activity level (Webster, Monsma, & Erwin, 2010). Therefore, this study will investigate the following two research questions.

Do pre-service early childhood education teachers have positive attitudes and perceptions concerning the benefits of physical activity for young children who are between Pre-K and 3rd grades?

How are their responses related to their demographic information?

Methodology

Subjects. The participants who took part in the survey were undergraduate students enrolled in early childhood education classes at Texas A & M University-Commerce. Of the 80 students that were surveyed, forty six percent of the participants were between the ages of 21 and 23. Thirty one percent of the students were between 18 and 20 years old, and Eighteen percent were 26 and older. Lastly, two percent of the participants were between 24 and 25 years old.

Seventy nine of the participants were females, leaving one male who participated in the survey.

Sixty eight percent of the participants were white. Twelve percent were African American, 11.4 percent were Hispanic, and 3.8 percent were 2 or more race.

When participants were asked what they considered their socioeconomic status of their family of origin to be seventy seven percent reported being from middle class while 15 percent claimed to be from the lower socioeconomic class. Eight percent stated that they grew up in the higher socio economic class.

Setting. The survey took place in a regional state university located in the Northeast geographic area of Texas. This university has been serving students for 122 years, and reaches out to a diverse population of students. These students represent various countries, states, and urban and rural settings within Texas. Students at this university study a wide range of subjects, ranging from elementary education to neurology and microeconomics. Currently this university offers offering more than 100 courses of study from 26 academic departments. (Texas A&M University-Commerce website, 2013).

Instrument. A survey instrument consisting of nine questions was disseminated to the students through the online survey company, Survey Monkey. This questionnaire was developed around demographic questions and questions concerning attitudes about physical activity. Demographic questions helped the researcher understand age, ethnicity, sex and socioeconomic background of the participants. The four attitudinal questions were created to measure the participant's responses toward physical activity. These questions were measured with a five-item Likert Scale. Questions were designed so that high scores mean positive attitudes towards physical activity. (See Table 1).

The questions emerged from validated guidelines for physical activity for young children (ages 5-12) produced by the National Association for Sport and Physical Education (See Table 1). In the absence of a validated instrument within the literature, these validated guidelines were used as a basis for creating the survey questions (National Association for Sport and Physical Education, 2004).

Procedures. Participants were notified of the survey through a verbal announcement in class by the researcher. Participants followed a link sent to them by their professor, which led them to the survey on Survey Monkey. The participants signed an informed consent before answering the first survey question. An incentive was not provided for survey completion.

Data analysis. The frequencies of all variables were calculated. Descriptive statistics were used to analyze the demographics of the participants (age, gender, ethnicity, socio-economic status, and amount of individual physical activity per day). An overall test for proportion was used to measure the probability for high scores $p=P r$ ($response=4$ or 5) exceeds 0.5. Chi-square test for independence was used to explore relationships between each demographic variable and each attitude question. Gender was not considered in this analysis due to the sample size ($N=1$ male) being too small. The statistical program, SAS, was used for data analyses.

Results

Responses concerning daily physical activity revealed that 41 percent of participants said that they take part in thirty minutes to one hour of physical activity per day. Thirty eight percent of participants claimed to take part in 30 minutes or less of physical activity per day. Fifteen percent said they spend between one to two hours in physical activity per day, and five percent spend more than two hours in physical activity per day.

Quantitative results. Overall the analyses revealed that the respondents overwhelmingly hold a positive attitude toward physical activities in the early childhood years ($p<0.001$). (See Table 2)

However, older teachers (>24 years) tend to demonstrate less support for the idea that children should accumulate at least 60 minutes, and up to several hours, of age-appropriate physical activity on all, or most days of the week. (See Table 3)

Limitations

Several study limitations existed. First, the respondents were not randomly selected from a large pool of pre-service teachers. The announcement was extended to several classes of early childhood education majors and the students themselves self-selected their participation in the survey. Second, the pools of respondents were students classified as juniors or seniors majoring in early childhood education. The prior instruction received in earlier education classes might have influenced their answers. Third, the questions used in the survey were not validated questions. Fourth, the survey respondents represented only one male. A large number of male respondents might have produced varying results. My research showed that gender was a barrier to physical activity since a study with preschoolers showed that boys were more active than girls. If I had more male respondents then the attitudes towards physical activity might have shown more positive.

Discussion and Implications

The purpose of this study was to examine two questions concerning the attitudes of pre-service teachers concerning physical activity among young children in the early childhood years: (a) Do pre-service early childhood education teachers have positive attitudes and perceptions concerning the benefits of physical activity for young children who are between PreK and 3rd grades? and (b) How are their responses related to demographic information?

The analyses revealed that the respondents held a significantly favorable attitude towards physical activity among young children in the early childhood years. In addition, demographic characteristics such as ethnicity, socio-economic status, or daily reported practices of physical activity did not influence their attitudes. However, the data revealed that those students aged twenty-four years and older reported less favorable attitudes than their younger counterparts.

The age discrepancy between younger and older students is worth noting. Although explanations for this variance were not analyzed in this study, it can be a factor in addressing some of the barriers that keep children from participating in physical activity. This is an area for exploration in future research.

Pre Service education. Students enrolled in pre-service early childhood education classes could benefit from greater instruction concerning the benefits of physical activity. By addressing barriers such as gender discrepancy with preschoolers and lack of knowledge within early childhood classes could help reduce the effects of these barriers (Reithmuller et al., 2009).

Elementary education. Opportunities for age related physical education in the elementary schools and within child-care settings must be increased. Targeted programs for the younger pre-service students could extend to their full service careers. Greater knowledge concerning the need for physical education could help prompt administrators to amend weekly schedules and provide greater amounts of time for physical activities.

Family education. Situational factors such as geographic living areas and child-care arrangements have been noted to influence the level of physical activity available for young children. The high proportion of pre-service early childhood teachers who are female insures that they will soon be parents of young children. By targeting this group and enhancing their level of expertise and enjoyment of physical activity, it can be assumed that they will seek solutions to the barriers their parents may have faced.

Textbook development. Textbooks in college classrooms need more information about how to implement physical activity in the classroom and physical activity ideas. These books form a foundation for the pre-service student's knowledge and attitudes about physical education. By enhancing the material, the pre-service teacher will create a greater foundation of understanding and practice.

Future research. More research concerning ways to transition attitude to practice and how much instruction is enough when teaching and designing early childhood education programs for pre-service teachers is needed to develop the literature base. Additionally, more research is necessary to understand the variables that influence the slightly lower attitudes of preservice teachers towards physical activity among young children.

Summary

Young children who participate in physical activity experience benefits that extend into their adult life (Abadie & Brown, 2010; Schachter, 2011). These advantages include greater academic achievement, less childhood and adult obesity, better physical health, and greater social and emotional adjustment. However, the decline in physical activity among young children has produced a sedentary lifestyle with grave consequences for their futures. The hope of producing global leaders in science, math and technology currently proposed by the U. S. Department of Education may also suffer. (National Center for Educational Statistics, 2010; U. S. Department of Education, 2013). In summary, it is paramount for those who care for young children to consider the sparse time that is devoted to physical activity in our nation's schools (Story, Nanny & Schwartz, 2009).

Figure 1: Physical Activity Pyramid (Corbin & Pangrazi, 2004)



Table 1

Preservice Teacher Attitude Survey

1. What is your age?
 - a. 18-20
 - b. 21-23
 - c. 24-25
 - d. 26 and older
2. What is your gender?
 - a. Female
 - b. Male
3. What is your ethnicity?
 - a. White
 - b. Black or African American
 - c. Asian
 - d. Native Hawaiian and other Pacific Islander
 - e. Hispanic
 - f. 2 or more races
4. What do you consider your socioeconomic status of your family of origin to be?
 - a. High
 - b. Middle
 - c. Low
5. How much time do you spend in physical activity per day?
 - a. 30 minutes to less
 - b. 30 minutes to 1 hour
 - c. Between 1 and 2 hours

- d. More than 2 hours
- 6. Please choose the most appropriate answer that corresponds most closely to your desired response concerning the following idea.

Children should accumulate at least 60 minutes, and up to several hours, of age-appropriate physical activity on all, or most days of the week. This daily accumulation should include moderate and vigorous physical activity with the majority of the time being spent in activity that is intermittent in nature.

- a. Strongly disagree
- b. Disagree
- c. Uncertain
- d. Agree
- e. Strongly agree
- 7. Please choose the most appropriate answer that corresponds most closely to your desired response concerning the following idea.

Children should participate in several bouts of physical activity lasting 15 minutes or more each day.

- a. Strongly disagree
- b. Disagree
- c. Uncertain
- d. Agree
- e. Strongly agree
- 8. Please choose the most appropriate answer that corresponds most closely to your desired response concerning the following idea.

Children should participate each day in a variety of age-appropriate physical activities designed to achieve optimal health, wellness, fitness, and performance benefits.

- a. Strongly disagree
- b. Disagree
- c. Uncertain
- d. Agree
- e. Strongly agree
- 9. Please choose the most appropriate answer that corresponds most closely to your desired response concerning the following idea.

Extended periods (periods of two hours or more) of inactivity are discouraged for children, especially during daytime hours.

- a. Strongly disagree
- b. Disagree
- c. Uncertain
- d. Agree
- e. Strongly agree

Table 2: Chart showing test of revealing overall test of proportion

Question Number	\hat{P}	Z-statistic	P-value
7	0.8291	5.850	<0.001
8	0.9156	7.294	<0.001
9	0.9295	7.586	<0.001
10	0.6772	3.153	<0.001

Table 3: Chart showing contingency table for age results

	Ages 18-20	Ages 21-23	Ages >=24
Not positive	3	4	6
Positive	24	32	10

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