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Correlates of Physical Activity and Sedentary Behaviors Among Overweight Hispanic School-aged Children[1]

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ABSTRACT

Purpose: The purpose of this study was to explore potential correlates of physical activity and sedentary screen time behaviors among overweight Hispanic school-aged children, ages 7 to 14 years.
Design and Methods: We conducted an exploratory correlation analysis using baseline data of 40 child-parent dyads from the "Mind Exercise Nutrition Do It!" program conducted in the Western United States.
Results: Child self-esteem and parental vegetable intake were moderately associated with physical activity, while parental vegetable intake and child fruit intake were strongly associated with physical activity among males. Physical activity was not significantly associated with body mass index percentile, sedentary screen time behaviors, or body esteem. Only decreased body esteem in males was correlated with sedentary screen time behaviors.
Conclusions and Practice Implications: Understanding the correlates of physical activity and sedentary screen time behaviors in this underrepresented population allows nurses to better understand the connections between physical activity and other aspects of well-being in children. Further investigation is needed to determine how these relationships can be incorporated into physical activity interventions that improve the health of overweight Hispanic school-aged children.

Physical activity (PA) is a universal need, required for general health and well-being at every age and in every population. Inadequate levels of PA and high amounts of sedentary behaviors increase an individual's risk for non-communicable diseases such as obesity, cardiovascular disease, diabetes, stroke, and cancer (Australian Government Department of Health, 2014; Tremblay et al., 2011; World Health Organization [WHO], 2017). There is strong evidence that PA helps to control body weight and improves metabolic, musculoskeletal, cardiovascular, and mental health. Also, higher levels of PA during childhood and adolescence decrease the risk of health problems later in life (U.S. Department of Health and Human Services [HHS], 2008; WHO, 2009, 2010).

Even though the benefits of regular PA and low amounts of sedentary behaviors are well known, the majority of youth do not meet activity recommendations (WHO, 2017). Recommendations for school-aged children include participating in at least 60 min of moderate to vigorous PA every day and limiting leisure sedentary screen time to <2 h per day (American Academy of Pediatrics, 2016; WHO, 2010). In a United States (U.S.) multistate survey, 57% to 74% of middle school students did not meet recommended levels of PA and 22% to 34% watched three or more hours of television on an average school day. Additionally, 35% to 48% of the middle school students played video games or played on a computer for three or more hours per day. Male students were significantly more likely than female students to achieve adequate levels of PA, but there was not a significant difference in sedentary screen time by gender (Centers for Disease Prevention and Control [CDC], 2016).

In 6 of 11 states surveyed, Hispanic students were significantly more likely than white students to have inadequate levels of PA, and in 7 of 11 states surveyed, Hispanic students were significantly more likely than white students to spend 3 or more hours per day watching television (CDC, 2016). Inadequate PA and high amounts of sedentary behavior among Hispanic youth are of particular concern due to the relationships among activity level, weight control, and physical and mental health (Nyberg, Ramirez, & Gallion, 2011). In addition, obesity among Hispanic youth in the U.S. is estimated to be around 22% while obesity among all U.S. youth is about 17% (Ogden, Carroll, Fryar, & Flegal, 2015).

Research suggests PA in youth is related to both child and parental factors. In a comprehensive review of 108 studies, Sallis, Prochaska, and Taylor (2000) found that increased PA in youth was consistently associated with being male and decreased sedentary behaviors. Healthy diets, such as those including high amounts of vegetables and fruits, were also linked to higher levels of PA in youth. However, results

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were inconsistent regarding the relationships among BMI, body image, self-esteem, and PA (Sallis et al., 2000). Recent research suggests that parental influence and support may play a role in child PA (Bauer, Laska, Fulkerson, & Neumark-Sztainer, 2011; Foran, Cermak, & Spruijt-Metz, 2013; Thomas et al., 2010). Specifically, parental role modeling of PA behaviors has been found to be positively associated with child PA (Garriguet, Colley, & Bushnik, 2017). Although, other researchers have found inconsistent results regarding the relationships between parent and child PA, as well as, sedentary activity (Jago et al., 2017; Jago, Fox, Page, Brockman, & Thompson, 2010). Findings regarding correlates of sedentary behavior have also been inconsistent in recent research, suggesting a need for further investigation (Arundell, Fletcher, Salmon, Veitch, & Hinkley, 2016; Sallis et al., 2000). In addition, researchers have found differences in the correlates of PA and sedentary behavior by child gender (Jago et al., 2010; Sallis et al., 2000).

Due to the inconclusive findings, further examination into the relationships of child and parental factors with child PA is warranted. Examination of these relationships is especially needed for populations that are commonly underrepresented in this type of research, such as the overweight Hispanic youth population. The purpose of this study was to explore potential correlates of PA and sedentary behavior among overweight Hispanic school-aged children, ages 7 to 14 years.

Methods

Study Design

This was an exploratory correlation analysis of secondary data from the Mind Exercise Nutrition Do It! (MEND) 7–13 program conducted in a school district in the Western U.S. during 2015 to 2016. The MEND 7–13 program is a multi-component, community-based, family-focused health intervention developed in the United Kingdom for overweight or obese children and their families (Sacher et al., 2005). The parent study was an adapted intervention study of the 10 week, biweekly group program focused on improving the health, fitness, and self-esteem among children in the U.S.

A convenience sample of five cohorts participated in the program over a year period in a community center setting. The 7–13 MEND program was designed for children ages 7 to 13; however, some of the children in this study were so close to their 14th birthdays at the time of data collection, that their ages registered as 14 years old. Children and their parents were recruited from Sheridan School-based Health Center, Sheridan School District, the MEND website, and community centers in Sheridan, Colorado. Students who met the criteria for overweight, BMI percentile at the 85% but <95% percentile, or obese, BMI percentile at 95% (CDC, 2015), were invited to participate in the after-school program with a parent.

Baseline data from children and their parents who voluntarily participated in the MEND program were used for this secondary analysis study, which focused on hypothesis generation regarding the correlates of PA and sedentary behaviors in overweight Hispanic school-aged children. The selection of variables for inclusion in this study was based on previous literature regarding potential correlates of PA and sedentary behaviors in children, as described in the background section of this article (Arundell et al., 2016; Garriguet et al., 2017; Jago et al., 2010; Jago et al., 2017; Sallis et al., 2000). The child variables included PA, sedentary screen time behaviors, BMI percentile, fruit intake, vegetable intake, self-esteem, and body esteem, which is the affective component of body image (Mendelson & White, 1982). The parental variables included PA, sedentary behavior, BMI, fruit intake, and vegetable intake.

The study was reviewed by the Colorado Multiple Institutional Review Board. Parental consent and student assent were obtained after a description of the study was provided. Data were collected at baseline with anthropometric measures obtained by trained research personnel, although many parents refused to participate in the height and weight measures. Self-report questionnaires were completed via paper and pencil with research assistants on hand to help parents and children with any questions (e.g., questions regarding duration and types of PA). Data were entered into an electronic database by a research assistant. Funding for the MEND 7–13 study was provided by the MEND Foundation.

Measures

All variables, except for BMI, were measured via self-report questionnaires filled out by the child or parent, or collaboratively by both, depending on the instrument. Child BMI percentile and adult BMI were calculated from measured height and weight (kg/m^2) (CDC, 2015). Child PA and sedentary screen time behaviors were measured using single questions from the MEND Physical Activity Questionnaire that was adapted from Slemenda, Miller, Hui, Resiter, and Johnston (1991). The child PA question asked how many days per week the child participated in at least 60 min of moderate PA, with moderate PA being characterized by "building up a sweat, becoming flushed or breathing deeply" (question 3). This item was selected in order to correspond closely with PA guidelines (American Academy of Pediatrics, 2016; WHO, 2010). Sedentary behavior was measured by asking how many hours per week the child spent "watching TV, DVDs, video or playing on the computer or with video games" (question7).

Parent and child fruit and vegetable intakes were self-reported in servings per day using single questions from the MEND nutrition questionnaires, designed by experts at MEND. The questions included examples of one serving size such as an apple, a banana, one cup of 100% fruit or vegetable juice, one cup cooked vegetables, or two cups leafy greens (MEND, 2014a; MEND, 2014b). The serving size examples provided to the participants align with cup-equivalent measurements used in U.S. nutritional recommendations (U.S. Department of Health and Human Services & U.S. Department of Agriculture, 2015).

Child body esteem, defined as someone's feelings towards his or her own body, was measured using the Body Esteem Scale, a 24-item questionnaire with established face validity and split-half reliability (0.85) among school-aged children (Mendelson & White, 1982). The Cronbach's alpha for the scale with the current sample of school-aged children was 0.82. Child self-esteem, defined as how someone evaluates his or her own self-worth, was measured via the Rosenberg Self-esteem Scale (Rosenberg, 1965). The Rosenberg Self-esteem Scale is a widely used and tested self-esteem scale that has been deemed reliable and validated for use in many populations and languages (e.g., Sinclair et al., 2010; Westaway, Jordaan, & Tsai, 2015). The scale is most often used with adolescents and adults (Fischer & Corcoran, 2007); however, in a study of students who were slightly older than this sample (mean age 12.30, SD = 0.49), the scale had an internal consistency of 0.86 (Ciarrochi, Heaven, & Davies, 2007). The Cronbach's alpha for the scale with the current sample of school-aged children was 0.84.

Parental PA was measured using the International Physical Activity Questionnaire Short Form (IPAQ-SF) (Craig et al., 2003), which has been widely used and tested in adults, albeit with inconsistent support for validity and reliability (Lee, Macfarlane, Lam, & Stewart, 2011). Parental sedentary behavior was measured by means of a single question from the IPAQ-SF asking how many hours and minutes per day the parent spent sitting at work, home, school, and during leisure time during the past week. The question included examples such as "sitting at a desk, visiting friends, reading, or sitting or lying down to watch television" (Craig et al., 2003, question 7).

Analysis

SPSS Statistical Software, version 23, was used to conduct the analysis. Missing data analysis revealed large amounts of missing data for parental PA (45% missing), parental sedentary behavior (40% missing),