Validation of Interviewer-Assisted Recall for Measuring Minutes of Moderate to Vigorous Physical Activity in Elementary School Children, Grades 3 and 5

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ABSTRACT

Objective: To test the validity of interviewer-administered recall for measuring moderate to vigorous physical activity (MVPA) in third- and fifth-grade children who reported physical activity (PA) only or both PA and diet, using a short (same-day recall in the afternoon) or long (previous-day recall in the morning) retention interval.

Methods: Randomly selected children (n = 95) wore an accelerometer 1 day in school. Interviews occurred in the afternoon of the day on which the accelerometer was worn or on the next morning. Assignment to interview content was random. Spearman correlations were calculated between MVPA interview and MVPA accelerometer minutes.

Results: The MVPA interview minutes were positively associated with the MVPA accelerometer minutes when the interview focused on PA only ($r = .34$; $P = .02$) but not when children recalled PA and diet ($r = .12$; $P = .40$). The MVPA interview minutes for the previous day was associated with the MVPA accelerometer minutes ($r = .33$; $P = .02$), but not for the same day ($r = .17$; $P = .26$).

Conclusions: A recall interview method that focuses solely on PA is a promising approach to assessing children's school-day PA.

Key Words: accelerometer, child, diet, physical activity (*J Nutr Educ Behav*. 2016;48:152-156.)

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INTRODUCTION

In recent decades, childhood obesity rates have soared in the US.[1] Consequently, the influence of the school environment on children's physical activity (PA) and dietary behaviors has come under intense scrutiny.[2] Many school-based interventions have attempted to increase PA and improve the dietary intake of children,[3] often with mixed or unclear results. Efforts to evaluate such interventions require valid measures of children's PA and dietary intake during the school day, but many existing measures have limited use in the school setting. For example, direct observation can be used to measure both PA and dietary intake, but it involves a heavy staff burden and high cost.[4] Accelerometry estimates of PA have been shown to be a valid measure of PA[5] but they provide no information on specific types of activity (including resistance training and bone-loading activities recommended for children in PA guidelines[6]) or the context in which the activity occurs. Surveys in which children self-report their PA and dietary intake can be used in school settings; however, the validity of existing survey instruments is limited and acceptable only for children over age 10.[7]

Studies of obesity prevention approaches in the school environment require good measures of both PA and dietary intake. One measurement tool that holds promise for assessing both behaviors in children, the interviewer-administered recall, typically performs better than self-report questionnaires.[8] However, little is known about the best way to conduct interviewer-administered recalls for school-based studies. For example, should interviews be focused on PA and dietary intake separately or measure them simultaneously in an integrated manner, as one study did in children aged 7–15 years[9] and a pilot study did in third- and fifth-grade children?[10] Combining PA

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and dietary intake into a single interview could reduce time spent collecting data, for both subjects and researchers. In addition, this study explored whether a shorter or longer retention interval (ie, elapsed time between events to be reported and the interview) was appropriate for elementary school children and whether there are developmental differences in recall ability. Thus, the purpose of this study was to assess the ability of an interviewer-administered recall to measure moderate to vigorous physical activity (MVPA) in third- and fifth-grade children who were asked to recall only their PA or both their PA and dietary intake, using either a short retention interval (same-day recall in the afternoon) or a long retention interval (previous-day recall in the morning). The researchers hypothesized that there would be no differences between the genders and the 2 interview contents, 2 retention intervals, and 2 grades.

METHODS

The University of South Carolina's Institutional Review Board approved the study procedures.

Study Design and Participants

Recruitment occurred in 21 third-grade classes and 21 fifth-grade classes in August and early September, 2010, at 4 public elementary schools in Columbia, SC. Of the 877 children invited to participate, the parents of 513 (58.5%) provided written informed consent. Children provided written assent. Race, ethnicity, and gender distributions of the 877 children who were invited were similar to the 513 participating children.

The study used a cross-sectional design. Training and practice data collection occurred in mid-September through October, 2010. Data were collected from November, 2010 through February, 2011. Children who consented were randomly selected and asked to wear an accelerometer for a day at school and/or were observed eating school-provided breakfast and lunch on the same day at school. From the pool of consented children who wore accelerometers and/or were observed, interviews occurred with randomly selected children until a total of 144 children were interviewed. Assignment to groups was random with the constraint that data collection continued until each of the 3 groups had 48 children with 24/retention interval (same-day afternoon [SDA]; previous-day morning [PDM]), and within retention interval, 12/grade with 6 boys and 6 girls per grade.[11] (Sample size calculations suggested that data from 144 children, with 48/group, would provide adequate power for the aims of the study.[11]) The 48 children in the first group were interviewed once each about PA that occurred at school on the day the accelerometer was worn; this was the PA-only group. The 48 children in the second group were interviewed once each about both PA and dietary intake that occurred at school on the day the accelerometer was worn and school meals were observed; this was the PA and diet group. The 48 children in the third group were interviewed once each about dietary intake at school for the day when school meals were observed; this was the diet-only group. Because the current article's purpose concerned MVPA, interviews by the 48 children in the diet-only group were not analyzed. (Results concerning dietary recall accuracy are provided elsewhere.[11]) Thus, this article concerns the 96 children assigned to the 2 PA interviews (PA-only; PA and diet) crossed with the 2 retention intervals (SDA; PDM). Each of these 4 combinations (referred to here as PA-only–SDA; PA-only–PDM; PA and diet–SDA; PA and diet–PDM) had equal numbers of third and fifth graders and boys and girls (8 subgroups with 12 children in each). Neither school staff nor children knew in advance which children would be interviewed, whether a child would be interviewed about PA-only or PA and diet, the day on which an interview would occur, or the retention interval (SDA or PDM) to be used in an interview. To allow for random selection for interviews, more children were consented than were needed, and more children wore accelerometers than were needed.

Accelerometry

Children wore an ActiGraph accelerometer (Model GT3X; The ActiGraph, LLC; Pensacola, FL) for 1 day while in school. Monitors were placed on the children in the school cafeteria before breakfast and were worn until the end of the school day. Monitors were initialized to save data in 1-minute intervals. Children wore the monitor on an elastic belt on their right hip (anterior to the iliac crest). ActiGraph files were summarized for MVPA, calculated using age-specific cut points for a threshold of 4 metabolic equivalents.[12,13] Sixty minutes of consecutive 0 values were considered non-wear time. Minutes per day of MVPA was the primary variable derived from the accelerometry data (MVPA accelerometer).

Interview Protocols

Four written multiple-phase interview protocols, modeled on the Nutrition Data System for Research protocol (Nutrition Coordinating Center, University of Minnesota, Minneapolis, MN), were developed for the 4 combinations of interview content and retention interval. A chronological format was used during the interview protocol rather than a free recall format, based on results from a qualitative study of interview-administered PA recalls by children.[14] Prompts concerning PA information were also incorporated into the interview to improve detail about how long the PA occurred and the intensity, based on a pilot study.[10] Interviewers participated in training that included role playing and practice interviews with research staff and children. After training, 1 of 3 interviewers conducted interviews in private locations at children's schools either after lunch (Monday through Friday for SDA) or after breakfast (Tuesday through Friday for PDM). Interviewers used paper forms to note information reported by children. Each interview was audio recorded and transcribed. For quality control, a non-interviewing researcher reviewed both the audio recording and the typed transcript of each interview. Quality control assessment indicated that interviews with 8 children failed to abide by the specific protocol (eg, the interviewer failed to ask questions as indicated in the protocol for an event [about PA or intake] reported by the child). Interviews with another 5 children had inadequate