Original research

Reliability and validity of the Youth Leisure-time Sedentary Behavior Questionnaire (YLSBQ)

Verónica Cabanas-Sánchez a, David Martínez-Gómez a, Irene Esteban-Cornejo a,b, José Castro-Piñero c, Julio Conde-Caveda c, Óscar L. Veiga a

a Department of Physical Education, Sport and Human Movement, Autonomous University of Madrid, Cantoblanco University City, Spain
b Department of Physical Education and Sports, University of Granada, Spain
c Department of Teaching Physical Education, Fine Arts and Music, University of Cádiz, Spain

A R T I C L E   I N F O

Article history:
Received 28 September 2016
Received in revised form 17 October 2017
Accepted 19 October 2017
Available online xxx

Keywords:
Sedentary
Screen time
Questionnaire
Validation studies
Children
Adolescents

A B S T R A C T

Objectives: To develop a questionnaire able to assess time spent by youth in a wide range of leisure-time sedentary behaviors (SB) and evaluate its test-retest reliability and criterion validity.

Design: Cross-sectional observational.

Methods: The reliability sample included 194 youth, aged 10–18 years, who completed the questionnaire twice, separated by one-week interval. The validity study comprised 1207 participants aged 8–18 years. Participants wore an accelerometer for 7 consecutive days. The questionnaire was designed to assess the amount of time spent in twelve different SB during weekdays and weekends, separately. In order to avoid usual phenomenon of time over reporting, values were adjusted to real available leisure-time (LT) for each participant. Reliability was assessed by using Intraclass Correlation Coefficients (ICC) and weighted (quadratic) kappa (κ), and validity was assessed by using Pearson correlation and Bland–Altman plots.

Results: The reliability of questionnaire showed a moderate-to-substantial agreement for the most (91%) of items (κ = 0.43–0.74; ICC = 0.41–0.79) with three items (4%) reaching an almost perfect agreement (ICC = 0.82–0.83). Only ‘sitting and talking’ evidenced fair-to-moderate reliability (κ = 0.27–0.39; ICC = 0.34–0.46). The relationship between average sedentary time assessed by the questionnaire and accelerometer was moderate (r = 0.36; p < 0.001). Systematic biases were not found between questionnaire and accelerometer sedentary time for average day (r = 0.05; p = 0.11) but Bland–Altman plots suggest moderate discrepancies between both methods of SB measurement (mean = 19.86; limits of agreement = −280.04 to 319.76).

Conclusions: The questionnaire showed moderate to good test-retest reliability and a moderate level of validity for assessing SB in youth, similar or slightly better to previously published in this population.

© 2017 Published by Elsevier Ltd on behalf of Sports Medicine Australia.

1. Introduction

Physical activity (PA) and sedentary behavior in children and adolescents are persistent public health challenges that must to be overcome. Over recent decades, a large body of epidemiological literature has provided evidence supporting the beneficial effects of PA in reducing the risk of many chronic diseases in young people.1 While PA is an accepted public health priority, the interest in sedentary behavior (SB) has been increasing.2 SB has been associated with cardiovascular and metabolic risk, obesity, low physical fitness, and low-grade inflammation in young people.3 Researchers stress that we should consider paradigms that include valid measurements of SB in order to capture overall patterns of human behavior.4 Measurement of SB is, therefore, a current challenge in health-related research.5 A considerable range of methods has been used to quantify SB in young people,5 including objective measures such as accelerometers or pedometers, and self-reported measures such as questionnaires or diaries. Self-reporting is commonly used to evaluate SB in epidemiological research because it involves very feasible methods that provide information about the type and context of the behaviors.5 However, validated questionnaires for SB assessment are extremely scarce in the literature and most are focused on a limited range of activities, which could lead to underestimation or misrepresentation of overall patterns.7 Therefore, a questionnaire to assess the length of time spent doing a wide range of sedentary

https://doi.org/10.1016/j.jsams.2017.10.031
1440-2440 © 2017 Published by Elsevier Ltd on behalf of Sports Medicine Australia.

behaviors that encompass most of the young population’s available leisure-time (LT) is needed.

In this sense, the purpose of this study was to develop a questionnaire, called the Youth Leisure-time Sedentary Behavior Questionnaire (YLSBQ), able to assess a large range of sedentary behaviors, and to evaluate the test-retest reliability and the criterion validity of this tool.

2. Methods

Data for this study are obtained from two different samples. For the reliability study, youth were recruited from four schools in Madrid (n = 208, 107 girls; aged 13.04 ± 2.07 years) and data collection took place in April and May of 2011. The validity study involved 1638 participants (800 girls; aged 12.62 ± 2.48 years) from 41 schools in Madrid and Cádiz, who participated in the UP&DOWN study. Baseline data from the UP&DOWN study included in the present work was collected between September 2011 and June 2012.

The study protocols were approved by the Bioethics Committee of the Scientific National Research Council (Madrid, Spain) and the Ethics Committee of the Hospital Puerta de Hierro (Madrid, Spain). Prior to the study, informed consent was obtained from the parents/guardians and participants involved.

SB was assessed by the YLSBQ (see Supplementary Appendix 1). The participants are asked to think back over the previous week and report the estimated average time devoted to each behavior during weekdays and weekend days, separately. The average time per day spent on each behavior and composite category was calculated as follows: [(weekday_time^5) + (weekend_time^2)]/7. A total sedentary time score was obtained by adding together the time reported for the 12 sedentary behaviors.

Sedentary time was also monitored by the Actigraph™ accelerometers, models GT1M, GT3X and GT3X+ (Actigraph TM, LLC, Pensacola, FL, US). A previous study demonstrated a strong agreement between the three models.

Additionally, information was collected on time spent doing PA on weekdays and weekend days. Sleep time was calculated based on the participants’ responses about their usual bedtimes and waking up times on typical weekday and weekend day. The school timetables were obtained directly from the participating schools (see Supplementary Appendix 2). These variables were taken into account to calculate the participants’ LT.

To evaluate the test-retest reliability, the YLSBQ was administered to the sample group on two occasions one week apart. Subjects who did not complete at least 75% of the questionnaire on the two occasions were excluded from the analysis (n = 14). Two methods were used to examine the test-retest reliability of each behavior and composite category. The Intraclass Correlation Coefficient (ICC) was calculated for items and composite categories. As in previous studies with similar characteristics, weighted kappa coefficients with quadratic weights were also computed for individual items (i.e. weekdays and weekend days). The ICC and weighted Kappa values were characterized as follows: slight agreement (0.00–0.20), fair agreement (0.21–0.40), moderate agreement (0.41–0.60), substantial agreement (0.61–0.80) and almost perfect agreement (0.81–1.00).

The criterion validity of the YLSBQ for assessing total sedentary time was estimated by comparing it with the accelerometer data. Participants were instructed to wear the accelerometers for 7 consecutive days positioned at the lower back attached to a belt. The accelerometer was worn during all time they were awake and was only removed when taking a shower or during sports participation. Data were collected at 2-s epoch and processed using the Actilife software (v.5.2.2 Actigraph TM, Pensacola, FL, US). At least 3 days of recording with a minimum of 10-h registration per day was defined as inclusion criterion. Since the YLSBQ deals with LT, a filter was applied to the accelerometer files in order to remove specific sleep hours and school time for each participant. Non-wear time was defined using the criteria described by Choi et al. Sedentary time was determined as the amount of time accumulated below 100 cpm.

Since over-reporting is a typical phenomenon identified by research using this kind of tool, before examining the validity, the questionnaire responses were subjected to an adjustment method so that the total time reported was adjusted to the participants’ real LT (see Supplementary Appendix 3). To adjust the questionnaire time scores, first, the real LT was calculated separately for week-days and weekend days taking into account information collected about the sleeping and school times of each participant [LT = day time – sleep time – school time (only in weekdays)]. Secondly, the total time reported was computed by adding together sedentary behaviors, as well as the complementary questions on PA. At last, the total time reported was adjusted to the real LT computing a weighted conversion factor for each behavior. Each behavior was adjusted according to its relative percentage of the total reported time using the following formula:

\[
T_{i}^{\prime} = \frac{(\text{LT} \times T_{i}^{2})}{\left(\sum_{i=1}^{16} T_{i}^{2}\right)}
\]

\(T_{i} = \text{Adjusted time of behavior}
\)

\(\text{LT} = \text{Leisure-time}
\)

\(T_{i} = \text{Unadjusted time of behavior}
\)

In order to examine the criterion validity, Pearson correlation coefficients were computed between reported sedentary time and accelerometer outputs. In order to explore which of the questionnaire outputs works better, correlations were calculated using the unadjusted reported time and the adjusted values. Finally, the Bland–Altman method was applied in an effort to explore the absolute grade of agreement between the accelerometer and questionnaire outputs, as well as to identify any potential systematic biases.

Data were analyzed using the SPSS for Windows statistical software package version 21.0 (SPSS Inc., Chicago, IL, USA) establishing a significance level of \(p < 0.05\).

3. Results

The YLSBQ design and selection of items was based on the qualitative analysis of the young people’s usual sedentary behaviors identified in the Project STIL (Sedentary Teenagers and Inactive Lifestyles) where an ecological momentary assessment method was used. Initially, our questionnaire included the behavioral categories referred to as LT and identified as relevant for young people on the aforementioned Project. In order to examine the comprehensibility, applicability and duration of completion, the questionnaire was pre-tested on a small sample of students (n = 47; aged 13.05 ± 0.82 years). Based on information from this pilot study, certain questionnaire items were modified. For example, ‘doing home chores’ and ‘doing paid work’ items were removed because the mean time reported in these activities was close to 0. Moreover, the item related to study time was divided into (i) doing homework/study with computer and (ii) doing homework/study without computer.

Thus, the final version of the YLSBQ was designed to assess the amount of time spent doing 12 sedentary behaviors that could be merged in four composite categories: screen time: (i) watching TV/videos, (ii) playing computer/video games and (iii) internet surfing; Non-Screen Sedentary Time (NSST)-Educational: (iv) doing...
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات