Psychometric properties of questionnaires to measure social ecological influences in Vietnamese children

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ABSTRACT

Physical activity data in primary school-aged children are limited in Vietnam. Although tools to measure social ecological influences on physical activity are validated in English, they are not available in Vietnamese. Due to cultural and contextual differences, their psychometric properties need to be tested. Five scales were translated into Vietnamese and evaluated for internal consistency and test re-test reliability, including self-efficacy, perceived social influences, and beliefs self-administered by students, and parental support for physical activity and parental perceived safety of the neighbourhood, self-administered by parents. Compared to the original scales, two items from the parental perceived neighbourhood safety were removed due to the cultural context. Another item of the self-efficacy scale was also removed as it correlated poorly with the other items in the scale at both administrations. The adjusted scales were found to be reliable and appropriate for use among students and parents to measure social ecological influences on physical activity in the Vietnamese context.

Introduction

Physical activity (PA) is an important lifestyle factor that is associated with multiple health-related conditions. However, a majority of children in many countries do not meet the PA recommendation of engaging in moderate-vigorous PA (MVPA) for at least 60 min/day. In many low and middle income countries (LMIC) including Vietnam where urbanisation and mechanisation are resulting in a more sedentary lifestyle, population-based PA data objectively measured in primary school-aged children are limited. Our recent study in urban areas of Ho Chi Minh City (HCMC), Vietnam showed that only about 18% of children met the PA recommendation and 52.7% were overweight/obese which clearly emphasized a need for interventions to improve PA. However, information about correlates of PA among primary-school aged children needed for designing and implementing effective interventions was not available in Vietnam.

Although many instruments to measure correlates of PA among children are available, their psychometric properties have not been examined among Vietnamese children. As the target population are young children, testing the instruments is necessary to provide information to improve the questions accounting for the children’s cognitive development. There are also differences in Vietnamese culture and context. For example, the most common means of transportation are motorbikes whereas cars are not popular in Vietnam. The local streets are usually used not only for transportation but also as playgrounds for children and as retail sites. Therefore, it was important to ensure that psychometric properties of instruments are tested before using them in different cultural contexts.

Five scales reflecting intrapersonal (self-efficacy, beliefs, and perceived social influences), interpersonal (parental support for PA), and environmental levels (parental perception of neighbourhood safety) were selected due to their important roles and potential effects on children’s PA. The first three scales were originally developed in English but were commonly used among fifth-grade students in South Carolina, USA, and third-to-fifth-grade students in Virginia, USA, and adolescents in Kuantan, Malaysia and Singapore. The parental support for PA and parental perception of neighbourhood safety, which are designed for parents/caregivers to complete, were developed respectively by Trost
Developed by Carver et al. 200813 has 14 items asking about parents stood, processed and responded to the scale items using a method of context. Vietnamese versions of the scales were then reviewed by two Vietnamese equipment version of Vietnamese. The back-translated version was then compared with the orig-

The practice suggested by Beaton et al. (2000) was modiﬁed and applied.16 The validated scales in English were translated into Viet-

This study speciﬁcally aims to (1) develop the Vietnamese version of the above questionnaires to measure socio-ecological in-

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The self-efﬁcacy scale has 17 items asking (i) whether students have support from parents/other adults or friends for PA; (ii) whether students are conﬁdent to overcome barriers to PA; and (iii) whether students have positive alternatives to PA. The perceived social inﬂuences scale has eight items to assess inﬂuences of family and friends on PA. The beliefs scale has 16 items asking students about consequences of being physically active. Responses for each item in these three scales are recorded as yes/no.

The parental support for PA scale which was developed by12 has ﬁve items asking during a typical week, how often would a mother/female or father/male adult in the household (i) “encourage your child to do physical activity or play sports”; (ii) “play outside with your child or do physical activity or sports with your child”; (iii) “ride or provide transportation to a place your child can do physical activity or play sports”; (iv) “watch your child participate in sport, physical activities, or outdoor games”; and (v) “tell your child that sports or physical activity is good for their health”. Responses for these questions are “never”, “<1 time-
s/week”, “1–2 times/week”, “3–4 times/week”, “5–6 times/week”, or “daily”.

The parental perceived safety of the neighbourhood scale which was developed by Carver et al. 200813 has 14 items asking about parents’ perception of road safety, incivilities, and personal safety of a child. Each question has a response of “strongly agree”, “agree”, “disagree”, and “strongly disagree”.

Development of the Vietnamese versions of the scales

The instruments to be tested included two questionnaires: one to be self-administered by students under supervision in the classroom and the other to be self-administered by their parents at home. The student questionnaire included three scales: self-efficacy, perceived social in-

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Participants and setting

Two urban primary schools in HCMC were purposively selected for the study. Students in four 5th-grade classes (n = 129 students) from one school were invited to complete the student survey on two occasions. Written consent forms were given to students to take home for their parents/caregivers to sign and return to school if they agreed for their children to participate. As a test-retest on parents of 5th-grade students in this school was unable to be conducted, the parents of students from two 4th-grade classes (n = 80 parents) in a neighbouring school from the same school district were invited to participate. Ethics approval from the Queensland University of Technology Human Research Ethics Commit-

data collection

The student questionnaire was administered during class time on a Monday morning at the beginning of the school day. A research assistant, provided instructions and supervised students while students completed the questionnaire. For parents/caregivers who participated in a test-

Discussion around the format included font size, type, and design of the questionnaires for readability. The content discussion included checking the understanding of each question, exploring responses and verifying answers. General probes and probes for specific questions were used to test issues related to wording, technical terms, reference periods, and vagueness.

Methods

Description of the instruments

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As a result of the interviews, changes in format and wording were made including increasing space between sentences; underlining or italicizing words for emphasis; replacing a matrix format with a simple text format; and using words “less than” instead of the symbol “<”. Items 5 and 13 were removed from the parental perceived safety scale due to the environmental context in HCMC in which fifth-grade students almost never take the bus to school and there are few traffic slowing devices in neighbourhoods.

evaluation of psychometrics

After the cognitive interviewing phase, the questionnaires were administered to parents and students from a single school to determine the psychometric properties of each scale.

Data analysis

SAS Version 9.4 and IBM SPSS Statistics Version 22 were used for the analyses. For the self-efficacy, social inﬂuences, and beliefs scales, a response to each item was assigned a score (yes = 1, no = 0) except that scores were reversed for items 2, 6, 8, 10, and 11 of the beliefs scale. For the parental support for PA scale, a score of 1–6 was assigned respectively to a response of “Never” to “Daily”. A score of 1–4 was assigned
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respectively to a response of “Strongly agree” to “Strongly disagree” for the parental perceived neighbourhood safety scale; except for items 5, 9, 10, and 11, scores were reversed. Internal consistency reliability was assessed using Cronbach’s alpha.

Total scores were calculated for each scale by summing scores of single items. These scores were used to compute Intra-class Correlation Coefficients (ICC) between two administrations (single measures coefficients were reported from two-way mixed effects model with absolute agreement).

Results

There were 129 students and 80 parents invited to participate in the study. A total of 99 students (54 boys and 45 girls) and 61 parents completed the first administration of the questionnaires, resulting in a response rate of 76.7% for students and 76.3% for parents. However, 96 students (74.4%) and only 41 parents (51.3%) completed the repeat administration of questionnaires one week later. At pre-test, students’ average age was 10.1 (SD = 0.3) years. Parents’ average age was 38.6 years (SD = 4.8) with 40% having an education level of high school/above at pre-test and 38.2 years (SD = 6.2) with 63.3% having an education of high school/above at post-test.

Internal consistency reliability

Cronbach’s alphas for the scales are presented in Table 1. All scales had moderate internal consistency reliability (alphas from 0.61 to 0.76). Due to low item to total score correlations (< 0.06), item 17 in the self-efficacy scale that asked whether students think they “can be physically active at least three times a week for the next 2 weeks” was removed from the final questionnaire.

Test-retest reliability

Test-retest reliability for the five scales is presented in Table 2. Self-efficacy, beliefs, and parental support showed good reliability, with ICCs ranging from 0.71 to 0.77. Reliability was fair for social influences (ICC = 0.57) and parental perceived neighbourhood safety (ICC = 0.56).

Discussion

This study was designed to develop and test psychometric characteristics of the Vietnamese version of questionnaires to measure socio-environmental influences on children’s PA. Compared to the original scales, two items from the Parental Perceived Neighbourhood Safety scale were removed due to the cultural context. The first item asked about “traffic slowing devices (e.g., speed humps) in our local streets”. These devices are extremely rare in the neighbourhoods in HCMC, and probably throughout Vietnam because the local streets are too narrow for cars to be able to enter, allowing only motorbikes and bicycles. These streets are also usually filled with families undertaking activities of daily life as well as shopkeepers. Therefore, the traffic is usually very slow even though there are no speed regulations or traffic slowing devices.

The other item asked about whether it was “safe walking home from a bus stop or train stop at night”. In HCMC, trains are not currently used because the school was not willing to send questionnaires to parents a second time, the parents of fourth-grade students from a different school because the school was not willing to send questionnaires to parents a second time, the parents of fourth-grade students from a different school. Finally, the study was conducted in two schools in a single school district and the results may not be generalizable to all children and parents in Vietnam. To conclude, the adjusted scales were found to be reliable and appropriate for use among 5th grade students and parents to measure social-

Table 2

| Test-retest Intra-class correlation coefficients (ICC) for each scale. |
|-----------------|---------|---------|
| Scale                        | n   | ICC (95% CI) |
| Self-efficacy                      | 96 | 0.71 (0.59, 0.79) |
| Perceived Social Influences       | 93 | 0.57 (0.42, 0.70) |
| Beliefs                          | 87 | 0.77 (0.67, 0.85) |
| Parental Support for physical activity | 39 | 0.73 (0.55, 0.85) |
| Parental Perceived Neighbourhood Safety | 41 | 0.56 (0.29, 0.74) |

Table 1

| Scales                                   | items | α      |
|------------------------------------------|-------|--------|
| Self-efficacy                            | 16    | 0.63   |
| Perceived Social Influences              | 8     | 0.62   |
| Beliefs                                  | 16    | 0.67   |
| Parental Support for physical activity   | 5     | 0.76   |
| Parental Perceived Neighbourhood Safety  | 12    | 0.74   |
ecological influences on PA in the Vietnamese context.

Conflict of interest

The authors declare no competing interests.

Submission statement

This manuscript is not currently submitted elsewhere. None of the manuscript’s contents have been previously published in any journal. All authors have read and approved the submitted manuscript.

Each authors’ contributions

All authors significantly contributed to the manuscript. QGT, SGT, DG, DVD, HTMT, KGT, LW designed the study. QGT, KGT, DVD, HTMT collected data. QGT drafted the manuscript. QGT, SGT, DVD, KGT, HTMT, KGT, LW critically reviewed the manuscript for important intellectual content.

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