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ORIGINAL ARTICLE

# Reliability and internal consistency of scales for parental and peer support for physical activity in children and adolescents in Chile

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## Abstract

**Aim** To evaluate the reliability and internal consistency of scales for parental and peer support for physical activity (PA) in children and adolescents in Chile.

**Subject and methods** This is a cross-sectional study with a sample of 160 youth, including 59 children and 101 adolescents, from the city of Viña del Mar (Chile). The parental support for PA was evaluated through the Family Support for PA Scale, while peer support was determined by the Friends Support for PA Scale, which are five-item and four-item Likert-type scales, respectively. Cronbach's α coefficients were calculated to evaluate the reliability, and the internal consistency was determined by test–retest, Kendall's τ-b coefficients.

**Results** The Family Support for PA Scale showed satisfactory reliability (Cronbach's alpha > 0.70) across the total sample and stratified by age and sex. In the second evaluation (retest), there was an increase in Cronbach's alpha values across all groups except for girls, suggesting enhanced reliability. This scale also showed strong internal consistency and moderate to high reliability in four out of five questions in all analysed groups (k = 0.50–0.69). The Friends Support for PA Scale indicated sufficient internal consistency, with an improvement in the second evaluation. Concerning reliability, data varied across the analysed questions, from low to moderate.

**Conclusion** The Family Support for PA Scale showed strong internal consistency and moderate to high reliability for most questions. At the same time, the Friends Support for PA Scale exhibited sufficient internal consistency and low to moderate reliability across questions.

**Keywords** Social Support · Active behaviour · Youth · Schoolchildren · Parents

## Introduction

Physical activity (PA) is strongly associated with indicators of physical, psychological/social, and cognitive health in youth (Poitras et al. 2016). It is recommended that children and adolescents perform at least 60 min of moderate to vigorous physical activity (MVPA) on average each day to obtain health benefits and for disease prevention (Bull et al. 2020). Unfortunately, Chilean children and adolescents rank fifth among the least active nations, according to the latest report from the Active Healthy Kids Global Alliance (AHKGA), reporting that only 27.4% of children and 18.9%

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of adolescents meet PA recommendations (Aguilar-Farias et al. 2020; Tremblay et al. 2022). As a result, strategies are being urgently sought to increase PA levels in Chilean children and adolescents.

Certain factors can influence the PA levels of children and adolescents. Social support is among the most important and modifiable factors for PA promotion (Glozah and Pevalin 2015). Social support refers to the "help or care received in personal relationships and interpersonal exchanges" (Hosokawa et al. 2023). A positive and significant relationship has been found between social support and compliance with PA recommendations (Trost et al. 2003; Khan et al. 2020). Social support encompasses numerous forms, including direct (e.g., engaging in PA with the children or adolescents), instrumental (e.g., providing transportation to the location of PA), and emotionally supportive behaviours (e.g., praise and encouragement). This support can be logistical, involving greater effort, or non-logistical, which involves verbal encouragement and motivation for the children's PA. In this regard, two parenting attitudes promote PA in children: direct strategies, such as taking children to locations where they can be active, and indirect strategies, including modelling and verbal encouragement (Barr-Anderson et al. 2010).

Parents strongly influence their children's lives and can positively affect PA levels (Loprinzi and Trost 2010). Parental support through provision of transportation and equipment is associated with increased PA in children and adolescents. Furthermore, when parents participate in PA with their children, they are more likely to adhere to PA guidelines (Pyper et al. 2016). As adolescents become more autonomous from their parents, they look more to their friends for behavioural and social cues (Gifford-Smith et al. 2005). Parental support for PA decreases, while peer support becomes increasingly important in determining PA levels (Kirby et al. 2011). Peer support plays an even more important role than family support in PA, since peers have a prominent role in behavioural change in adolescents (Prochaska et al. 2002).

In this context, previous studies carried out in Chilean children on parental support for PA have shown that parental support is positively associated with light PA and negatively associated with sedentary time, in addition to influencing levels of moderate PA performed during physical education classes (Aguilar Farías et al. 2020; Salas et al. 2018). The focus often seems to be on the family. Studies conducted in the United States have also aimed to validate parental and peer support scales. A parental support scale for PA demonstrated internal reliability of 0.77, while the 1-week test–retest reproducibility for this measure was 0.67 (Trost et al. 2003). Similarly, a peer support scale for PA showed 2-week test–retest reliability and internal consistency of 0.54 (Prochaska et al. 2002).

The present study considers that the support of peers and family aids in meeting PA recommendations in children and adolescents. The relevance of the present study thus lies in its proposal to evaluate an instrument that measures a significant aspect of youth behaviours within the specific context of Chile. The study aimed to evaluate the reliability and internal consistency of scales for parental and peer support for PA in children and adolescents in Chile.

## Methods

### Study design and sample

This cross-sectional study was conducted in August to September 2023. This reliability and consistency study was part of the ACTIBESE Project—Active Behaviour in School Education: Ecological Model Application on School Physical Education to improve active behaviours in schoolchildren, whose main objective is to determine the school, interpersonal and personal factors that influence the active behaviour of schoolchildren, considering the ecological theory as a model of interaction at school and in physical education. Initially, a meeting was held with school directors to explain the objectives and procedures of the study and to invite their participation. Following this, two members of the research team attended parent meetings at the schools to provide detailed information about the study and seek consent for their children's involvement. In total, 160 youth participants were recruited from two conveniently selected schools—one publicly subsidized ($n = 130$) and one privately administered ($n = 30$). The final sample included 59 children (aged 9–11) and 101 adolescents (aged 12–17). All participants completed the questionnaires; however, some data were missing (ranging from one to three cases depending on the variable) and were therefore excluded from the analysis. A post hoc power analysis was performed using G*Power software (version 3.1) to estimate the statistical power achieved based on the available sample size of 159 participants. The analysis was performed for correlation tests considering a significance level of $\alpha = 0.05$ and an expected medium effect size ($r = 0.30$). The resulting power ($1 - \beta$) was 0.97, indicating that the sample size was sufficient to detect statistically meaningful associations.

This study was approved by the Ethics Committee of the Pontificia Universidad Católica de Valparaíso (code: BIOPUCV-H 638–2023) and was carried out following the guidelines for ethical procedures in studies with humans in line with the Declaration of Helsinki (World Medical Association 2013).

## Data collection

Before the data collection, all participants signed an informed consent form accepting their participation in the study. Each participant answered the Family Support and Friends Support for Physical Activity Scales twice with an interval of 7 days between evaluations. The questionnaires were answered during physical education class, on the same day and simultaneously in the company of a member of the project who had previously been trained. The time to answer the complete questionnaire, including demographics and other PA domains, ranged between 20 and 40 min.

## Measurements

### Parental support

Parental support was assessed using the Family Support for Physical Activity Scale (Trost et al. 2003), a five-item Likert-type scale. Children and adolescents rated the frequency of their parents' participation in activities that encouraged and supported the practice of PA, as follows: (1) watching the child's or adolescent's participation in PA or sports, (2) encouragement for PA and sports practice, (3) providing transportation, (4) engagement in exercise together, and (5) talking about the importance of PA. The possible answers were never (code 0), 1–2 days (code 1), 3–4 days (code 2), 5–6 days (code 3), and every day (code 4).

### Peer support

Peer support was assessed through the Friends Support for Physical Activity Scale (Prochaska et al. 2002). In this four-item Likert-type scale, participants evaluate the frequency with which their peers carry out the following activities: (1) encouragement for PA and sports practice, (2) engagement in exercise together, (3) friends mocking skills, and (4) friends praising efforts. The possible answers were never (code 0), 1–2 days (code 1), 3–4 days (code 2), 5–6 days (code 3), and every day (code 4).

## Statistical analysis

Cronbach's alpha coefficients were computed to assess the internal consistency and reliability of the questionnaires, considering the total sample and stratifying by sex and age. The threshold used for determining satisfactory internal consistency was 0.70–0.80 (Bland and Altman). The Kendall's τ-b coefficients for ordinal data were used to assess test–retest reliability, indicating the level of agreement between scores while considering the degree of deviation. This test was applied to the total sample and stratified by sex and age. Kendall's τ-b values were categorized as follows: negligible (0.00 to 0.30/0.00 to −0.30), low (0.30 to 0.50/−0.30 to −0.50), moderate (0.50 to 0.70/−0.50 to −0.70), high (0.70 to 0.90/−0.70 to −0.90), and very high (0.90 to 1.00/−0.90 to −1.00). All analyses were conducted using IBM SPSS Statistics v.25.0 software (IBM Corp., Armonk, NY, USA).

# Results

Table 1 presents the internal consistency and reliability results for the family support and peer support scales by age group and sex in the first and second evaluations (test and retest). Family support data indicated sufficient internal consistency in the first evaluation (0.70 and higher) across the total sample, stratified by age and sex. In the second evaluation (retest), Cronbach's alpha values increased across all groups except for girls, suggesting enhanced reliability (e.g., 0.83 in boys). Concerning peer support, the first evaluation indicated sufficient internal consistency for adolescents (0.70) and boys (0.74). However, for the total sample, children, and girls, Cronbach's alpha was higher than 0.60. The second evaluation (retest) showed improved Cronbach's alpha values in the total sample, adolescents, and girls.

**Table 1** Internal consistency of the parental support and peer support scales by age group and sex (test and retest)

| | Parental support | | Peer support | | Parental support | | Peer support | |
|---|---|---|---|---|---|---|---|---|
| | Test | | | | Retest | | | |
| | *n* | Cronbach's alpha | *n* | Cronbach's alpha | *n* | Cronbach's alpha | *n* | Cronbach's alpha |
| Total | 159 | 0.75 | 160 | 0.69 | 157 | 0.79 | 159 | 0.70 |
| Children (9–11 years) | 58 | 0.70 | 59 | 0.66 | 58 | 0.79 | 58 | 0.62 |
| Adolescents (12–14 years) | 101 | 0.76 | 101 | 0.70 | 99 | 0.77 | 101 | 0.74 |
| Sex | | | | | | | | |
| Boys | 71 | 0.79 | 71 | 0.74 | 70 | 0.83 | 70 | 0.69 |
| Girls | 89 | 0.79 | 89 | 0.63 | 87 | 0.72 | 89 | 0.72 |

Table 2 presents the test–retest reliability of the family support scale for the total sample, among boys and girls, and for children and adolescents. The Kendall's τ-b for the total sample was moderate to high (k = 0.56–0.70) for the questions regarding watching PA and sports practice, encouragement for PA and sports practice, providing transportation, and engagement in exercise together. Similar results were observed for the same questions for boys (k = 0.52–0.72) and girls (k = 0.53–0.67). For children, most of the questions (watching PA and sports practice, providing transportation, and engagement in exercise together) showed moderate reliability (k = 0.50–0.69), while for adolescents, this was observed for all questions (k = 0.55–0.67). The question related to talking about the importance of PA was the only one that presented low reliability in the total sample and the groups of boys and children.

Table 3 presents the test–retest reliability of the Friends Support Scale in the total sample, among boys and girls, and among children and adolescents. The first question, which focuses on encouragement for PA and sports practice, demonstrated moderate reliability across all analysed subgroups (k = 0.53–0.65) except children (k = 0.42). The second question, which addressed engagement in exercise together, showed moderate reliability across all subgroups (k = 0.57–0.62). However, the third question, regarding friends mocking others' skills, exhibited low reliability for all subgroups (k = 0.31–0.43). Lastly, the fourth question, concerning praise for efforts, demonstrated moderate reliability overall (k = 0.52–0.53), except for children, where it was low (k = 0.49).

## Discussion

The present study aimed to evaluate the reliability and internal consistency of scales for parental and peer support for PA in children and adolescents in Chile. The main findings indicated that the Family Support for PA Scale showed strong internal consistency and moderate to high reliability in four out of five questions in all analysed groups. The only exception was the question related to talking about the importance of PA, which exhibited low reliability in the total sample and in the groups of boys and children. The Friends Support for PA Scale indicated sufficient internal consistency, with an improvement in the second evaluation. Concerning reliability, data varied across the analysed questions. Questions 1 (encouragement for PA and sports practice), 2 (engagement in exercise together), and 4 (praising efforts) showed moderate reliability in all subgroups except children. Question 3 (friends mocking skills) showed low reliability for all subgroups.

The literature suggests that both friends and parental support for PA are often measured using the same scale,

**Table 2** Test–retest reliability of the Family Support Scale in the total sample, among boys and girls, and for children and adolescents

| Question | Total | | Boys | | Girls | | Children | | Adolescents | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b |
| 1. Watching PA and sports practice | 160 | 0.70 | 71 | 0.72 | 89 | 0.67 | 59 | 0.69 | 101 | 0.67 |
| 2. Encouragement for PA and sports practice | 160 | 0.56 | 71 | 0.52 | 89 | 0.59 | 59 | 0.48 | 101 | 0.59 |
| 3. Providing transportation | 160 | 0.65 | 71 | 0.66 | 89 | 0.63 | 59 | 0.65 | 101 | 0.65 |
| 4. Engagement in exercise together | 157 | 0.56 | 70 | 0.60 | 87 | 0.53 | 58 | 0.50 | 99 | 0.59 |
| 5. Talking about importance of PA | 159 | 0.49 | 71 | 0.45 | 88 | 0.52 | 58 | 0.34 | 101 | 0.55 |

*PA* physical activity; *n* sample size. Probability level is $p < 0.001$ for Kendall's τ-b reliability test and retest evaluations for all analyses

**Table 3** Test–retest reliability of the Friends Support Scale in the total sample, among boys and girls, and among children and adolescents

| Question | Total | | Boys | | Girls | | Children | | Adolescents | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b | *n* | Kendall's τ-b |
| 1. Encouragement for PA and sports practice | 159 | 0.57 | 70 | 0.53 | 89 | 0.59 | 58 | 0.42 | 101 | 0.65 |
| 2. Engagement in exercise together | 159 | 0.60 | 70 | 0.63 | 89 | 0.57 | 58 | 0.51 | 101 | 0.62 |
| 3. Friends mocking skills | 159 | 0.35 | 70 | 0.31 | 89 | 0.38 | 58 | 0.43 | 101 | 0.32 |
| 4. Praising efforts | 159 | 0.52 | 70 | 0.52 | 89 | 0.52 | 58 | 0.49 | 101 | 0.53 |

*PA* physical activity, *n* sample size. Probability level is $p < 0.001$ for Kendall's τ-b reliability test and retest evaluations for all analyses

collectively forming the social support for PA. For example, a study conducted by Mendonça et al. (2022) among Brazilian children and adolescents applied a scale of 15 items, five for each source (father, mother, and friends), and found satisfactory levels of reproducibility and construct validity. This is similar to our findings, although Mendonça et al. did not perform specific analyses by sex and age groups. From the same perspective, Filho et al. (2016) reported that the scales measuring support of parents and friends for PA showed acceptable psychometric properties and construct validity with almost all items.

When considering the total sample, we observed that Cronbach's alpha values and Kendall's τ-b were higher for parental support than for peer support. This indicates that the construct of parental support is more stable over time than the construct of peer support and that the reliability of the parental support scale is higher than that of the peer support scale. This finding aligns with a study that investigated parental and peer support using a similar approach, with short scales of eight and three items, respectively (Reimers et al. 2012). A possible explanation for the discrepancy in reliability between these constructs may be the fact that children have not yet adopted a behaviour fully independent of their parents, and the support for PA from friends is not yet as intense (Jago et al. 2009; Khan et al. 2020). Also, this may be related to the current lifestyle, where 80% of adolescents do not achieve sufficient levels of PA (Guthold et al. 2020). This suggests that these individuals may also be less likely to establish or foster peer support for engaging in PA (Zhou et al. 2023).

Indeed, the contexts of family and friends are primary sources associated with PA among children and adolescents (Lisboa et al. 2021; Hosokawa et al. 2023). They provide various forms of social support, including instrumental, psychological, and instructional, which can vary depending on the type of PA undertaken and the sex and age of the individuals involved (Mendonça et al. 2014; Beets et al. 2015). Boys and girls may perceive support from friends and family for PA differently for various reasons such as social norms and sex expectations, which influence how they are encouraged or discouraged from engaging in PA by their friends and family (Sanz-Martín 2020). Additionally, children and adolescents may have different perceptions regarding social support, and there is some evidence indicating that the importance of support in predicting PA decreases with age (Morrissey et al. 2015). In our study, we found divergent results between boys and girls regarding the parental support and peer support scales, particularly in questions related to discussing the importance of PA. Similarly, differences were observed between children and adolescents in three questions related to peer support.

Another aspect that should be considered is that the family support scale question regarding talking about the importance of PA was the only one that exhibited low

reliability. This could be related to respondents who have varying perceptions of or attitudes towards discussing the importance of PA with their family or friends, contributing to inconsistent responses and decreased reliability. Moreover, cultural or contextual factors may also influence the relevance or salience of discussing the importance of PA within familial or peer relationships, further impacting the reliability of this particular question.

Several strengths of this study should be highlighted. First, the validation of scales for peer support and parental support among children and adolescents in Chile offers a valuable tool for future research, supplying a robust method to assess these dimensions. Additionally, we conducted separate analyses based on sex and age, allowing us to determine the reliability and consistency of the scales across different subgroups. This enhances the overall reliability and applicability of the tool.

Limitations of the present study include the fact that the sample was restricted to participants from the Fifth Region of Chile and involved only private and subsidized schools, which may limit the generalizability of the findings to the broader population. In addition, the use of a convenience sampling method may limit the representativeness of the sample. Another limitation is that parental support was not assessed separately for mothers and fathers, and previous studies suggest that maternal and paternal support may have distinct influences on children's PA habits (Cheng et al. 2014).

In conclusion, the Family Support for PA Scale demonstrated strong internal consistency and moderate to high reliability for most questions in the present study. In addition, the Friends Support for Physical Activity Scale exhibited sufficient internal consistency. Concerning reliability, data varied across the questions, from low to moderate. Therefore, from a practical perspective, this study confirms that the Family Support for PA Scale and the Friends Support for PA Scale could be valuable tools for assessing social support for PA among children and adolescents in Chile.

**Author contributions** Conception and design of the study: CB, NZC, FRR. Acquisition of data: NZC, FRR. Statistical analysis: CB, VBL. Drafting the article and revising it critically for important intellectual content: CB, FRR, VBL, NAF. Final approval of the version to be submitted: all authors.

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**Data Availability** Availability database in: https://drive.google.com/file/d/1ZKknPqi1jZ6jynJPQlk837y5fW2W7mxD/view?usp=share_link

## Declarations

**Conflict of interest** The authors declare no conflict of interest.

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