

Validade e reprodutibilidade da versão brasileira da escala de suporte social para o exercício em adolescentes

Reliability and Validity of the Brazilian Version of Social Support for Exercise Scale for Adolescents

REIS, R.S.; SALLIS, J. Validade e reprodutibilidade da versão brasileira da escala de suporte social para o exercício em adolescentes. **R. bras. Ci e Mov.** 2005; 13(2): 7-15.

RESUMO - O Suporte social é um importante mediador psicossocial para a atividade física em adolescentes. Entretanto, instrumentos válidos para avaliar este mediador em adolescentes Brasileiros são até agora inexistentes. O propósito deste estudo foi avaliar psicometricamente a versão Brasileira da Escala de Suporte Social para o Exercício em Adolescentes. Participaram do estudo 540 estudantes de ensino médio (57.5% meninos) entre 14 e 17 anos. Foram selecionados aleatoriamente 64 participantes para avaliar a reprodutibilidade através do coeficiente Intra-Classe (R). A consistência interna foi avaliada através do coeficiente alfa-Chronbach. A validade critério-concorrente foi avaliada através da Correlação Ordenada de Spearman entre as escalas e: a) minutos por semana de atividade física moderada a vigorosa (MVPA); b) minutos por semana de atividades estruturadas e c) caminhada como transporte. Os valores de alfa variaram de 0.78 a 0.81 e os coeficientes Intraclass de 0.61 a 0.81. Todas escalas apresentaram correlação com ao menos duas medidas de atividade física, evidenciando a validade. As escalas de suporte social apresentaram fidedignidade adequada e validade moderada para o uso em adolescentes Brasileiros. Medidas mais objetivas da atividade física são necessárias para avaliar mais adequadamente a validade.

PALAVRAS-CHAVE - Exercício, Psicologia, Adolescente, Comportamento.

REIS, R.S.; SALLIS, J. Reliability and Validity of the Brazilian Version of Social Support for Exercise Scale for Adolescents. **R. bras. Ci e Mov.** 2005; 13(2): 7-15.

ABSTRACT - Social Support is an important psychosocial mediator of physical activity, particularly in adolescents. However, a valid and reliable instrument to measure this mediator in Brazilian adolescents is not available. The purpose of this study was to evaluate psychometrically a Brazilian-Portuguese version of the Social Support for Exercise Behavior Scale with adolescents. Participants were 540 high-school students (57.5% boys) with ages ranging from 14 to 17 years. A sub-sample of 64 participants was randomly selected to assess one week test-retest reliability by intraclass correlation. Internal consistency reliability was assessed by Cronbach's alpha. Concurrent criterion validity was assessed by Spearman rank-order correlation between the social support scales and minutes per week of moderate to vigorous physical activity (MVPA), minutes of structured activities per week and minutes per week of walking for transport. Cronbach's alpha for subscales ranged from 0.78 to 0.81 and Intraclass coefficients ranged from 0.61 to 0.81. All social support subscales correlated significantly with at least two physical activity measures supporting validity. These social support scales showed adequate reliability and moderate validity with Brazilian adolescents. Objective physical activity measures are needed to evaluate further the validity.

KEYWORDS - Exercise, Psychology, Adolescent Behavior

Rodrigo Siqueira Reis¹
James F. Sallis²

¹ Universidade Federal de Santa Catarina,
Florianópolis – Santa Catarina – Brasil.
Pontifícia Universidade Católica do Paraná,
Curitiba – Paraná – Brasil.
² San Diego State University, San Diego –
California – United States

Estudo Financiado pela
CAPES (BEX 0006/01-04)

Recebimento: 01/08/2004
Aceite: 18/01/2005

Correspondence: Rodrigo S. Reis. 1810, Cypress Avenue #24 San Diego – California - 92103. United States. Phone: (619) 220-7981 / 497-1850.
e-mail: reis.rodrigo@pucpr.br

Introduction

Lack of physical activity is putting many adolescents at risk for health problems. The 2001 Youth Risk Behavior Survey showed that 38% of adolescent boys and 34% of adolescent girls in the United States did not meet recommendations for moderate or vigorous physical activity (7). Adolescence is the time of peak decline in physical activity (17). The proportions of low physical activity from 9th grade to 12th grade increase for boys (20% to 30%) and girls (28% to 48%) in the U.S (7).

To prevent the decline of physical activity observed in youth it is important to understand the factors that have the potential to influence this behavior. A recent review showed that psychosocial factors such as self-efficacy, social support and intention are consistently associated with adolescent physical activity (16).

Indeed, social support seems to play an important role in health habits (9), but its role in physical activity it is somewhat controversial. For instance, social support, particularly from parents and peers, has been related to higher physical activity levels in adolescents and children (16). However, recent findings have shown that social support and objective measures of adolescent physical activity are not correlated (11). Furthermore, social support for physical activity rarely has been studied in developing countries.

A scale to measure social support for exercise has been developed in English (13). Social Support for Exercise Scale consists of three subscales: friends exercising together, family participation and involvement, and family rewards and punishment.

This scale has adequate reliability and validity in adults (13) and has been employed in several studies with adults (14,15) and middle and older-aged women (6). However most of these studies have been carried out in the United States. One exception is the Dutch version of the Social Support for Exercise Scale which showed adequate reliability in that population (18).

The understanding of psychosocial factors related to physical activity in Brazilian adolescents is limited by the lack of reliable instruments. The purpose of the present study was to evaluate the reliability and the validity of a Brazilian version of the Social Support for Exercise Behavior Scale (SSEBR) with adolescents.

Methods

Translation

The translation and adaptation process was conducted as recommended in a recent review (5) and consisted of a two stage procedure. The first stage was an independent translation conducted by one Brazilian-Portuguese native speaker with English skills, who translated the English version to Brazilian-Portuguese, and one American-English native speaker and Brazilian resident, who translated the Brazilian-Portuguese version to English. The two English versions were compared and some semantic discrepancies were identified. After some modifications the first draft was obtained.

During the second stage, an expert committee review verified the coverage of the theoretical construct as well as the instrument format. This committee was composed of four former United States residents, all health or exercise PhD's and Brazilian-Portuguese native speakers. The committee suggested a few modifications to improve the clarity of the instrument. Finally, the second draft was administered to a group of 10 high school students to verify comprehension on the questions and the response format. Though developed for use by adults, the adolescents found the items to be relevant to them.

Participants

The SSEBR plus other self-report measures were administered to 540 high-school students all residents in a large city in south Brazil and enrolled in Physical Education classes at a Federal High School. The questionnaire was administered to groups during the physical education classes. A subsample of 64 participants was randomly selected, and the SSBS-Br was re-administered one week later to assess test-retest reliability.

Measures

The translated version of Social Support for Exercise Scale was administered with all original items (13) and consisted of two sets of 13 items, each set related to one source of support (family and friends). The respondents rated the frequency with which both family and friends had done or said what was described in the items in the previous three

months. For better understanding, a family was defined as “members of the household” and friends as “friends, acquaintances, or co-workers”. The response format was also the same as the original and consisted of a 5 point scale ranging from 1 (none) to 5 (very often). Scores are produced by computing the sums of responses for each scale.

Two different instruments were employed to assess physical activity and provide validity evidence. The first was an adapted version of the Portuguese IPAQ Short-Form - International Physical Activity Questionnaire (4). This instrument was modified and the respondents were asked not to consider the time spent in physical education classes. The minutes per week of vigorous and moderate activity were added to generate a single score (MVPA). IPAQ was also employed to estimate the minutes per week walking for transport. Test-retest reliability scores were 0.86 (CI 0.79-0.91) for MVPA and 0.78 (CI 0.66-0.86) for walking for transport.

The cut-point employed for IPAQ followed the current guideline for youth physical activity (3) and “active” was defined as doing at least 60 min of moderate to vigorous physical activity per day and “less active” were those who did not meet this criterion.

The second instrument was an activity checklist, consisting of common moderate and vigorous structured activities, such as team sports and athletics. These activities were identified in a focus group study and the Compendium of Physical Activities (1) was used to establish intensity levels. The respondents reported the frequency and duration of each activity performed in the last two weeks, and the total minutes per week of moderate and vigorous structured activities (ACT) were computed. This measure had an adequate test-retest reliability ($R=0.70$; CI 0.60-0.81).

Basic demographics and lifestyle activities were collected. Health perception was determined by a four-point scale employed in another adolescent study (7). This measure was dichotomized into two categories, “positive health” and “negative health”. Social economic level (SES) was estimated by the Brazilian Economic Criterion (2). The original SES categories were grouped in three levels A (high), B (medium), and C (low).

Data Analysis

To analyze the construct validity of the SSEBR an exploratory factor analysis was employed and a principal component analysis with Varimax rotation was performed. The sample adequacy was assessed by the KMO statistic. Factors with eigenvalues higher than 1.0 and items with loadings greater than 0.4 were accepted (10).

Criterion validity was assessed by Spearman rank-order correlation between the factors generated in the factor analysis and the physical activity measures. Social support was expected to be positively correlated with all physical activity variables, except walking for transportation because this is not considered “exercise”. Thus, walking for transportation could provide evidence of divergent validity.

Reliability was assessed by internal consistency (Cronbach's alpha) and test-retest (Intraclass correlation-R) with one week test-retest. All analyses were performed using SPSS 11.0 and a significance level of 5%.

Results

Basic socio-demographics and lifestyle habits are shown in Table 1. Participants were adolescents whose ages ranged from 14 to 17, with similar age distributions for boys and girls. Overall, participants were high or medium SES, non-smokers, and reported good health perception. However, almost three-fourths of the participants did not meet the current guidelines for physical activity in youth. As expected, girls were less active than boys.

The factor solution for the Friend Support for Exercise Scale (Table 2) contained two factors with eigenvalues greater than 1.0 and accounting for 55.4% of variance. Factor 1, was identified as “participation and involvement” and contained 6 items. Factor 2 was identified as “exercising together” and had 7 items. The amount of variance explained was similar for both factors.

For the Family Support for Exercise Scale, the factor solution (Table 2) contained three factors with eigenvalues greater than 1.0, accounting for 59.6% of total variance. Factor 1 was identified as “participation and involvement” and had 5 items. Factor 2 was termed “exercising together” and had 5 items. The third factor, labeled “talked about

exercise", had 3 items. Factor 1 had the greatest variance explained as well as the highest eigenvalue.

To assess overlap, factors within a scale were correlated. Factor correlations were 0.56 between the two Friend Support Scales. For the Family Support Scales correlations were 0.49 between participation/involvement and exercising together; 0.48 between participation/involvement and talked about exercise and 0.54 between exercising together and talked about exercise.

Table 4 shows the reliability coefficients. The Cronbach's alpha coefficients ranged from 0.81 to 0.87 for Friend Support Scales and from 0.69 to 0.83 for Family Support

Scales. Only one subscale had an alpha lower than 0.7. The factor test-retest reliability scores (R) ranged from 0.62 to 0.72 for Friend Support Subscales and from 0.61 to 0.78 to Family Support Subscales. All the Intra-class coefficients were acceptable but were lower than 0.7.

The correlations between Social Support factors and physical activity measures are presented in Table 5. For Friend Support, all correlations were significant with the exception of minutes per week walking for transport. However the correlations for "exercising together" were greater and more significant than those observed on "participation and involvement" subscale.

Table 1. Characteristics of Participants in the Study

Variable	Boys(n=328)	Girls(n=242)	Total(n=570)
Age – years (%)			
14	10.4	12.0	11.1
15	28.8	28.5	28.2
16	40.9	37.6	39.5
17	20.7	21.9	21.2
Social-Economic Level (%)			
A (higher)	39.6	37.5	38.7
B (medium)	54.9	55.9	55.1
C (low)	5.7	6.6	6.1
Smokers (%)	2.4	2.5	2.5
Positive Health (%)	88.5	83.0	86.1
At least 60 min/day MVPA (%)	21.3	14.0	18.2

Table 2. Factor analysis of Friend Support for Exercise Scale (n=570)

Scale Items	Factor Loadings	
	Factor 1	Factor 2
1. Exercise with me		0.786
2. Offered to exercise with me		0.757
3. Gave me helpful reminders to exercise		0.612
4. Gave me encouragement to stick with my exercise program		0.551
5. Changed their schedule so we could exercise together		0.561
6. Discussed exercise with me		0.652
7. Complained about the time I spend exercising	0.811	
8. Criticized me or made fun of me	0.880	
9. Gave me rewards for exercising	0.832	
10. Planned for exercise on recreational outings	0.494	
11. Helped plan activities around my exercise	0.678	
12. Asked me for ideas on how they can get me more exercise	0.671	
13. Talked about how much they like to exercise		0.538
Eigenvalue	5.397	1.811
% Variance	30.72	24.72

Table 3. Factor analysis of Family Support for Exercise Scale (n=570)

Scale Items	Factor Loadings		
	Factor 1	Factor 2	Factor 3
1. Exercise with me		0.721	
2. Offered to exercise with me		0.725	
3. Gave me helpful reminders to exercise		0.693	
4. Gave me encouragement to stick with my exercise program		0.650	
5. Changed their schedule so we could exercise together		0.507	
6. Discussed exercise with me			0.526
7. Complained about the time I spend exercising	0.773		
8. Criticized me or made fun of me	0.857		
9. Gave me rewards for exercising	0.822		
10. Planned for exercise on recreational outings			0.761
11. Helped plan activities around my exercise	0.520		
12. Asked me for ideas on how they can get me more exercise	0.556		
13. Talked about how much they like to exercise			0.730
Eigenvalue	4.931	1.716	1.032
% Variance	23.85	19.71	15.50

Table 4. Means, Standard Deviations, Test-Retest Reliabilities (R) and Internal Consistencies (a-Cronbach) of Social Support Subscales

Scale	Means	SD	Test-retest Reliability (n=65)	Coefficient alpha (n=570)
Friends Participation/Involvement	11.71	9.19	0.62 ^a	0.87
Friends Exercising Together	19.76	8.78	0.72 ^a	0.81
Family Rewards/Punishment	10.00	7.52	0.78 ^a	0.83
Family Exercising Together	12.78	6.56	0.61 ^a	0.78
Family Participation/Involvement	7.50	3.75	0.71 ^a	0.69

^a $P < 0.001$

For Family Support subscales there were no correlations with walking for transport. All the subscales but one were significantly correlated with MVPA and ACT. Family participation/involvement had more significant correlations than exercising together, however the actual values were similar.

Discussion

The development of a reliable and valid physical activity social support measure is necessary to improve the understanding of this mediator in Brazilian adolescents. Overall, the results showed reasonable evidence that

the SSEBR had acceptable psychometric performance in this population.

The SSEBR factor structure differed somewhat from the original (13), as well from the Dutch version (18). For instance, family support had three subscales in the SSEBR, while only two subscales were found in these studies. However, the previous studies were carried out in adult populations, which could explain the different factor structure found in SSEBR. The final solution for friend support subscales was similar to the previous studies and also had two subscales.

Table 5. Spearman Correlations of Social Support Factors with Moderate to Vigorous Physical Activities (MVPA), Structured Activities (ACT) and Walking for Transport (WLPA).

Scale	MVPA	ACT	WLPA
Friends Participation/Involvement	0.12 ^b	0.09 ^a	0.04
Friends Exercising Together	0.36 ^b	0.20 ^b	-0.13
Family Rewards/Punishment	0.13 ^a	0.10 ^a	0.03
Family Exercising Together	0.11 ^a	0.19 ^b	0.01
Family Participation/Involvement	0.05	0.08 ^a	0.03

^a $P < 0,05$ ^b $P < 0,00$

Internal consistency reliabilities were adequate and similar to those observed in other studies (13,18), although two scales had alpha values less than the desirable 0.7. The test-retest reliabilities were generally good and even higher than in the original study (13).

All scales, with one exception, correlated with two physical activity measures. These correlations were lower than those reported in other studies which employed the original scale with adults (14,15). However, the consistency of the moderate correlations provides some evidence of validity. The lack of correlation with walking for transport indicates divergent validity, because SSEBR is designed to assess a mediator of recreational physical activity.

Among the friend subscales, “exercising together” was the stronger measure. For the family scales, “talked about exercise” was the weakest one.

Some limitations should be considered with SSEBR. The original scales were developed for adults and may miss important elements of parental support for adolescent physical activity, such as paying for and transporting to physical activity programs. Thus, it is useful to develop additional items for this measure of adolescent physical activity support (11).

The criteria employed to support validity were self reported physical activity measures. A recent review suggests that these measures have low validity compared to interviews and objective measures (12). Additionally, the short IPAQ has overestimated the physical activity level compared to the long-version in Brazilian adults (8).

Most participants were middle to high SES, so the SSEBR may work differently in low SES adolescents. To avoid these limitations future studies should consider qualitative studies, such as focus groups to develop additional items, including adolescents of specific relevance to adolescents. Future studies should include adolescents from more diverse SES backgrounds. Studies should also use objective physical activity measures. In conclusion, although it can be improved, the SSEBR is performed well and can be used for measuring social support for physical activity in Brazilian adolescents.

References

1. Ainsworth BE, Haskell WL, Whitt MC *et al.* Compendium of physical activities: an update of activity codes and MET intensities. **Medicine and Science for Sports and Exercise**. 2000; 32(suppl): 498-504.
2. Brazilian Association of Inquiry Enterprises. **Economic Classification Criterion**. Available in <http://www.anep.org.br/codigosguias/CCEB.pdf> [2004, March 5].
3. Cavil N, Biddle D and Sallis JF. Health enhancing physical activity for young people: statement of the United kingdom expert consensus conference. **Pediatric Exercise Science**. 2001; 13: 12-25.
4. Craig CL, Marshall AL, Sjoström M *et al.* International physical activity questionnaire: 12-country reliability and validity. **Medicine and Science for Sports and Exercise**. 2003; 35: 1381-1295.
5. De Vijver FV and Hambleton RK. Translating tests: some practical guidelines. **European Psychologist**. 1996, 1: 89-99.
6. Eyler AA, Brwonson RC, Donatelle RJ *et al.* Physical activity social support and middle and older-aged minority women: results from a US survey. **Social Science Medicine**. 1999; 49: 781-789.
7. Grunbaum JA, Kann L, Kinchen SA *et al.* Youth Risk Behavior Surveillance- United States, 2001. **MMWR Surveillance Summary**. 2002; 51: 1-62.
8. Hallal PC, Victora CG, Wells JCK, Lima RC and Valle NJ. Comparison of short and full length international physical activity questionnaire. **Journal of Physical Activity and Health**. 2004; 1: 227-234.
9. Perry CL, Stone EJ, Parcel GS *et al.* School-based cardiovascular health promotion: The child and adolescent trial for cardiovascular disease (CATCH). **Journal of School Health**. 1990; 60: 406-413.
10. Pett MA, Lackey NR and Sullivan JJ. **Making sense of factor analysis: The use of factor analysis for instrument development in health care research**. Thousand Oaks, CA: Sage Publications, 2003.
11. Prochaska JJ, Rodgers MK and Sallis JF. Association of parent and peer support with adolescent physical activity. **Research Quarterly for Exercise and Sports**. 2002. 73: 206-210.
12. Sallis JF and Saelens BE. Assessment of physical activity by self report: status, limitations and future directions. **Research Quarterly for Exercise and Sport**. 2000; 71: 1-14.
13. Sallis JF, Grossman, RM, Pinski, RB *et al.* The development of scales to measure social support for diet and exercise behaviors. **Preventive Medicine**. 1987; 16: 825-836.
14. Sallis JF, Hovell MF, Hofstetter CR *et al.* Explanation of vigorous physical activity during two years using social learning variables. **Social Science Medicine**. 1992; 34: 25-32.
15. Sallis JF, Hovell MF, Hofstetter CR. Predictor of adoption and maintenance of vigorous physical activity in men and women. **Preventive Medicine**. 1992; 21: 237-251.
16. Sallis JF, Prochaska JJ, Taylor WC. A review of correlates of physical activity of children and adolescents. **Medicine and Science for Sports and Exercise**. 2000; 32: 963-975.
17. Sallis, JF. Age-related decline in physical activity: a synthesis of human and animal studies. **Medicine and Science for Sports and Exercise**. 2000; 32: 1598-1600.
18. Stevens M, de Dijk AB, de Greef MHG *et al.* A Dutch version of the social support for exercise behaviors scale. **Perceptual Motor Skills**. 2000; 90: 771-774.