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Validation of the Piers-Harris Children Self-Concept Scale – PHCSCSV1-6 in Brazilian Portuguese for adolescents

Validação do Piers-Harris Children Self-Concept Scale – PHCSCSV1-6 para português do Brasil em adolescentes

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ABSTRACT The study validated the Piers-Harris Children Self-Concept Scale (PHCSCSV1-6) for Brazilian adolescents, an instrument for measuring self-concept. The culturally adapted Brazilian Portuguese version (BR-PHCSCS) was administered to 325 adolescents aged 12-18 years at public and private schools in two cities in Northeast Brazil. Psychometric properties analyzed included internal consistency (Cronbach's alpha and McDonald's omega), reproducibility (Intraclass Correlation Coefficient [ICC]), convergent validity (Depression, Anxiety and Stress Scale [DASS-21]), discriminant validity (sociodemographic variables), predictive validity (dental caries and occlusal aspects) and factorial validity (Exploratory Factor Analysis [EFA]). The scale exhibited satisfactory Cronbach's alpha = 0.79; McDonald's omega = 0.78; ICC = 0.97. The scale showed a multidimensional structure with six factors, explaining 45.3% of the variance. Convergent validity was confirmed with BR-PHCSCS and DASS-21 scores (rs = -0.575, p < 0.001). Discriminant validity revealed associations with type of school (p = 0.033), number of children (p = 0.027), guardian's education level (p = 0.008), and monthly income (p = 0.018). The self-concept of BR-PHCSCS was not associated with occlusal problems or caries experience. BR-PHCSCS demonstrated satisfactory psychometric properties for Brazilian adolescents aged 12-18 years and can be reliably used for other situations that exert an influence on the construct.

KEYWORDS Dental caries. Malocclusion. Oral health. Self-concept. Validation study. Reproducibility of results.

RESUMO *O estudo validou a Piers-Harris Children Self-Concept Scale (PHCSCSV1-6) para adolescentes brasileiros, um instrumento para medir o autoconceito. A versão adaptada para o Brasil (BR-PHCSCS) foi administrada a 325 adolescentes de 12 a 18 anos de escolas públicas e privadas do Nordeste do Brasil. As seguintes propriedades psicométricas foram analisadas: consistência interna (alfa de Cronbach e ômega de McDonald), reprodutibilidade (Coeficiente de Correlação Intraclasse [CCI]), validade convergente (Escala de Depressão, Ansiedade e Estresse [DASS-21]), validade discriminante (variáveis sociodemográficas), validade preditiva (cárie dentária e aspectos oclusais) e validade fatorial (análise fatorial exploratória [AFE]). A escala apresentou alfa de Cronbach satisfatório = 0,79; ômega de McDonald = 0,78; CCI = 0,97; e estrutura multidimensional com seis fatores, explicando 45,3% da variância. A validade convergente foi confirmada com os escores do DASS-21 (rs = -0,575, p < 0,001). A validade discriminante revelou associações com tipo de escola (p = 0,033), número de filhos (p = 0,027), escolaridade do responsável (p = 0,008) e renda (p = 0,018). O autoconceito não foi associado a problemas oclusais ou cárie. A escala demonstrou propriedades psicométricas satisfatórias para adolescentes brasileiros e pode ser usada de forma confiável para outras situações que influenciem no construto.*

PALAVRAS-CHAVE *Cárie dentária. Má oclusão. Saúde bucal. Autoimagem. Estudo de validação. Reprodutibilidade dos testes.*

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Introduction

Self-concept regards one's perception of oneself[1,2]. Individuals with less clarity in terms of self-concept normally also have lower self-esteem and tend to maintain relatively unstable self-descriptions over time[3,4]. It is connected to levels of anxiety and personal motivation, which exert psychoeducational interventions[5].

Like self-esteem, self-concept is part of a psychosocial dimension that can directly affect the development of children and adolescents. The perceptions they have about themselves are analyzed not only based on their abilities but are also the result of an in-depth analysis of their social constructions, personal achievements and experiences[6,7].

Adolescence is a period of the construction of one's identity as well as the formation, establishment and improvement of practices that can enhance one's mental health[8]. This developmental stage is often characterized by a heightened awareness of one's body, which frequently coincides with an increase in body image dissatisfaction[9].

Oral health exerts a considerable impact on the quality of life and health of adolescents[10]. Thus, seeking knowledge of the self-concept level of young people in this phase can contribute to the detection of possible environmental and social exposures and diminish the occurrence of mental health problems during this process[6,7,11].

Some measures designed to assess self-concept have been validated, such as the Multidimensional Self-Concept Scale, which uses a self-report format with Likert scale responses[12]. The Piers-Harris Children's Self-Concept Scale (PHCSCS) was originally developed in the 1960s as a short self-report instrument to assess self-concept in children and adolescents[13]. The most recent formulation emerged in Portugal, with the improvement of the psychometric qualities of the scale[14].

After additional analyses, the 30-item PHCSCSV1-6 was developed and validated. In this version, the scale was improved and the number of items was reduced, consequently diminishing the time required to answer the questionnaire. The items maintained the six responses options, with a higher final score denoting a higher level of self-concept[14].

The Brazilian adaptation of this scale offers an important tool for the clinical assessment and monitoring of adolescents in psychotherapy, which facilitates the identification of students with adjustment difficulties and the assessment of emotional well-being among adolescents in vulnerable situations at educational institutions[12-14].

Therefore, the aim of the present study was to validate a self-concept instrument (the Piers-Harris Children Self-Concept Scale – PHCSCSV1-6, in Brazilian Portuguese version) for use on adolescents aged 12 to 18 years, considering the hypothesis that this version will be compatible with culture and language in Brazil and will exhibit adequate psychometric properties (reliability and validity), with the belief that lower self-concept scores would be related to a greater quantity of occlusal problems and caries experience.

Materials and methods

Design

A validation study with an analytical, cross-sectional approach was conducted to validate the Piers-Harris Children Self-Concept Scale PHCSCSV1-6 in Brazilian Portuguese for adolescents. The present investigation followed the guidelines of the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) for validation studies[15].

Participants

The study population was composed of adolescents aged 12 to 18 years duly enrolled at

public and private schools in the municipalities of Santa Luzia and Campina Grande in Northeast Brazil, respectively with an estimated population at the time of 2,342 students and 24,911 adolescents[16]. The decision was made to include participants from two different municipalities to obtain the perceptions of individuals from two different circumstances with regard to the construct addressed on the scale. The study was conducted based on the hypothesis that the scale has validity and reliability for the age group and population described.

Sample calculation

The total sample was composed of 325 students aged 12 to 18 years from public and private schools in the municipalities of Santa Luzia and Campina Grande. This sample size is enough to detect correlation coefficients as low as 0.20, based on a bilateral test, an alpha of 0.05 and a 95% test power[17].

Eligibility criteria

Adolescents aged 12 to 18 years of both sexes duly enrolled in public and private schools in the municipalities of Santa Luzia and Campina Grande, Brazil, were included. The participants could not have any systemic diseases, physical disabilities or learning disabilities (reported by the teachers present at the time of data collection). Adolescents undergoing orthodontic treatment at the time of data collection were excluded, as such treatment could hinder the diagnosis of dental caries during the clinical examination in the school setting.

Calibration

The calibration of the examiner (postgraduate student) for dental caries followed the method proposed by Peres, Traebert and Marcenes[18], using the International Caries Detection and Assessment System (ICDAS). Cohen's Kappa coefficient was > 0.80 ($p < 0.05$).

Malocclusion was assessed using the Dental Aesthetic Index (DAI). The examiner underwent training and calibration exercises, obtaining Cohen's Kappa coefficient ≥ 0.90 ($p < 0.05$). The training of the researchers for the PHCSCSV1-6 scale was achieved during the pilot study and calibration was not necessary.

Cross-cultural adaptation

Prior to the onset of the cross-cultural adaptation, the authors of the original scale were contacted and authorized the translation and validation of the scale for Brazilian Portuguese.

The cross-cultural adaptation process was performed by a team with vast experience in the construct studied and followed a preestablished method[19], the steps of which are described below:

a. Translation: The translation of the scale from English to Brazilian Portuguese by two independent translators native to Brazil.

b. Unification of the questionnaire: A team of specialists unified the two translated versions, defining the writing of the items in the unified version in Portuguese.

c. Back translation: The unified version of the scale in Portuguese was back translated into English by a native English-speaking translator with ample skill in Brazilian Portuguese and no prior knowledge of the scale.

d. Revision of the back translation and unification of the questionnaire: The team of specialists analyzed the back translated version compared to the original scale and produced a second unified version that was sent to the authors of the original scale for their opinion.

e. Pretest of the scale: Interviews with probing questions were held with a group of 25 adolescents enrolled at a public school

to identify possible understanding difficulties of the scale. The participants in this step were encouraged to point out difficulties in terms of clarity and suggest synonyms for terms or words that were difficult to understand.

f. Final discussion of the team of specialists and production of the final questionnaire: The team of specialists met, considered the suggestions of the interviewed adolescents and those of the authors of the original scale, and created the final version of the questionnaire in Brazilian Portuguese (BR-PHCSCS).

Pilot study

Prior to the onset of the main study, a pilot study was conducted to test the proposed data collection methods and the applicability of the questionnaire. This phase was held at two schools (one public and one private) selected by convenience. The 40 adolescents who participated in this phase were not included in the main study.

Nonclinical data collection

The parents/guardians of the adolescents answered a sociodemographic questionnaire with items related to the guardian (sex, ethnicity, marital status, degree of relatedness to the adolescent, number of children, education level, income and main occupation) and the adolescent (age, grade, type of school, sex, date of birth and whether the adolescent had been ill in the previous 15 days).

The questionnaires were then collected and the adolescents were conducted in groups of five to a quiet room at the school for the self-administration of the Brazilian version of the Pier-Harris Self-Concept Scale (BR-PHCSCS) and the Depression, Anxiety and Stress Scale (DASS-21).

The Brazilian version of the BR-PHCSCS is directed at adolescents, addressing the perceptions adolescents have about themselves. The scale is composed of 30 items and has a structure composed of six factors: anxiety, physical appearance, behavioral adjustment, popularity, happiness and intellectual status. The individual items were summed to calculate the score for each participant. Each item is scored from one to six points. For the inverse items (Item 1, Item 3, Item 4, Item 7, Item 9, Item 10, Item 11, Item 13, Item 15, Item 16, Item 19, Item 20, Item 21, Item 22, Item 25, Item 27, Item 28, Item 29, Item 30), the numerical value was reversed prior to entering the final sum of the scores[14].

DASS-21 is also directed at adolescents and used to identify levels of depression, anxiety and stress based on sensations and conduct experienced by adolescents. This is a clear instrument of easy application in both the clinical setting and epidemiological studies and has been translated and validated in Brazil for use on adolescents[20]. DASS-21 is composed of 21 items designed to assess the three disorders simultaneously (depression, anxiety and stress). The final score is multiplied by 2 to correspond to the original DASS-42. A score is calculated for each subscale (depression, anxiety and stress), leading to a classification of normal, mild, moderate, severe and extremely severe, with higher scores denoting more symptoms of each construct[21].

Clinical data collection

After answering the questionnaires, the participants performed supervised toothbrushing, followed by the collection of the clinical data (dental caries and malocclusion) for the divergent validity analyses.

The adolescents were examined individually in a reserved, well-lit room. The clinical examination was performed with the participant sitting in front of the examiner and assistant, who were using personal protective equipment. The intraoral examinations were performed with the aid of a

head lamp (Petzl Zoom head lamp, Petzl America, Clearfield, UT, USA), sterile mouth mirrors (PRISMA, São Paulo, SP, Brazil), sterile probes recommended by the World Health Organization (OMS-621-Trinity, Campo Mourão, PA, Brazil) and gauze to dry the teeth.

The International Caries Detection and Assessment System (ICDAS) was used for the diagnosis of dental caries, which includes non-cavitated and cavitated active and inactive lesions and the assessment of caries in three dimensions: severity, extent and activity. The codes included in the present study ranged from 2 (white spot visible without drying) to 6 (caries with dentin exposed occupying more than half of the surface), which indicated the presence of active and inactive carious lesions with or without cavity and with or without pulp involvement[22].

The Dental Aesthetic Index (DAI) was used to assess malocclusion. The following cutoff points were considered: 13 to 25 = normal occlusion or minimal malocclusion; 26 to 30 = definite malocclusion (treatment elective); 31 to 35 = severe malocclusion (treatment highly desirable); and ≥ 36 = very severe or disabling malocclusion (treatment mandatory)[23].

Statistical analysis

Internal consistency of the scale was analyzed using Cronbach's alpha (α) coefficient and McDonald's omega coefficient[24]. Test-retest reliability was determined using the Intraclass Correlation Coefficient (ICC) for the scores of the scale, considering 95% confidence intervals. For such, the scale was applied a second time after a 15-day interval in 20% of the adolescents in the study at public and private schools (half of the students at each location). The validity of the construct was determined using convergent, divergent and predictive validities. Convergent validity was determined through the correlation of the BR-PHCSCS and DASS-21 scores. Spearman's correlation coefficients were calculated, as the total BR-PHCSCS and DASS-21 scores had nonparametric distribution. Divergent validity was investigated by comparing the BR-PHCSCS scores among the sociodemographic variables using the Mann-Whitney and Kruskal-Wallis tests. Predictive validity was determined by comparing the BR-PHCSCS scores between adolescents with and without malocclusion, with and without caries as well as with and without caries on anterior teeth using the Mann-Whitney test ($p < 0.05$). The hypothesis was that adolescents with a lower self-concept score would also have a greater quantity of occlusal problems and caries experience.

Factorial validity was investigated using Exploratory Factor Analysis (EFA), with the fit of the dataset determined using the Kayser-Meyer-Olkin (KMO) measure (> 0.50) and Bartlett's Sphericity Test ($p < 0.05$). The Promax method was used for rotation. Factor loadings equal to or higher than 0.40 were considered adequate[24].

The entire statistical analysis process was performed using the IBM SPSS Statistics (Statistical Package for the Social Sciences), version 25.0, (IBM Corp., Armonk, NY, USA) and the Mplus program (version 8.2; Muthén & Muthén), with the significance level set at 5% ($p < 0.05$).

Ethical considerations

The project for this study received approval from the Human Research Ethics Committee of Universidade Estadual da Paraíba (approval certificate number: 60413722.0.0000.5187; ethical approval number: 5.539.253). The following documents were sent: the Informed Consent Form, intended for parents or guardians to sign, and the Informed Assent Form, which was duly signed by the adolescent. The study followed Brazilian ethical research guidelines (Resolution No. 466/2012 and Resolution No. 510/2016)[25,26].

Results

Adaptation to Brazilian Portuguese

A total of 25 adolescents aged 12 to 18 years of both sexes answered the BR-PHCSCS in the presence of the researcher with the purpose of determining whether the items and instructions were simple and understandable. The students understood the items well and no suggestions were made for any changes to the writing of the questionnaire.

No changes were needed to the structure of the questionnaire and no linguistic adjustments to the items were necessary, achieving good semantic and cultural equivalence. The authors of the original scale were contacted to assess and authorize the final version of the scale in Brazilian Portuguese.

Characteristics of participants

Three hundred twenty-five adolescents and their respective parents/guardians participated in the study. Adolescents who attended public school (90.2%), those who studied in the morning shift (43.4%), girls (53.2%) and adolescents up to 13 years of age (69.5%) predominated in the sample. With regard to the guardians, most were women (88.3%), with a complete high school education or higher (64.9%), self-declared non-white skin color (73.2%) and with a family income of up to the monthly minimum Brazilian wage (64.5%) (*table 1*).

Table 1. Mean (± SD) PHCSCS scores according to sociodemographic characteristics of participants and guardians. Paraíba, Brazil. 2022

Variables		N (%)	PHCSCS Mean (± SD)	*p-value*
Guardian's sex	Female	38 (11.7)	116.57 (18.22)	.718
	Male	287 (88.3)	118.00 (19.69)	
Guardian's race	White	87 (26.8)	118.39 (17.22)	.397
	Non-white	238 (73.2)	116.57 (19.04)	
Guardian's marital status	With partner	140 (43.1)	118.57 (18.84)	.345
	Without partner	185 (56.9)	115.98 (18.31)	
Degree of relatedness to adolescent	Father	37 (11.4)	118.79 (18.80)	.760
	Mother	257 (79.1)	116.74 (18.48)	
	Other	31 (9.5)	117.90 (19.35)	
Adolescent's school shift	Morning	141 (43.4)	119.27 (18.25)	.106
	Afternoon	118 (36.3)	116.55 (18.47)	
	Full time	66 (20.3)	113.41 (18.96)	
Type of school	Public	293 (90.2)	116.44 (18.62)	.033
	Private	32 (9.8)	122.50 (17.24)	
Adolescent's sex	Male	152 (46.8)	119.70 (18.14)	.080
	Female	173 (53.2)	114.73 (18.65)	

Table 1. Mean (± SD) PHCSCS scores according to sociodemographic characteristics of participants and guardians. Paraíba, Brazil. 2022

Variables		N (%)	PHCSCS Mean (± SD)	*p-value*
Adolescent's age	Up to 13 years	226 (69.5)	117.36 (18.64)	.696
	More than 13 years	99 (30.5)	116.43 (18.44)	
Have other children or ever took care of children other than this one?	Yes	266 (81.8)	116.14 (18.44)	.133
	No	59 (18.2)	121.29 (18.62)	
If yes, how many?	Up to 2	237 (72.9)	118.31 (17.65)	.027
	More than 2	88 (27.1)	113.73 (20.53)	
Schooling of person who answered the questionnaire	Up to complete primary school	114 (35.1)	113.76 (18.29)	.008
	High school or more	211 (64.9)	118.76 (18.50)	
Family income	Up to monthly min. wage	200 (61.5)	115.60 (18.62)	.018
	+ than monthly min. wage	110 (33.8)	119.75 (18.20)	

Source: The authors.

Psychometric properties

The scale exhibited excellent reliability, with good internal consistency (Cronbach's alpha = 0.79; McDonald's omega = 0.78) and test-retest reliability (ICC = 0.97; 95% CI: 0.96-0.98). Among the total correlations of the items, most values were near or higher than 0.40, indicating adequate correlation of the items with the scale. *Table 2* displays the mean total and variance of the scale if one item were deleted. Cronbach's alpha did not increase if any item were removed.

The prerequisites for EFA were met (KMO = 0.764; significant Bartlett's Sphericity Test [$p < 0.001$]). EFA suggested a solution with six factors as the most adequate, explaining 45.3% of the variance. The following is the presentation of each factor and respective items: I. Anxiety (Items 1, 7, 13, 19 and 25) Cronbach's alpha = 0.60; II. Physical appearance (Items 2, 8, 14, 20 and 26) Cronbach's alpha = 0.65; III. Behavioral adjustment (Items 3, 9, 15, 21 and 27) Cronbach's alpha = 0.63; IV. Popularity (Items 4, 10, 16, 22 and 28) Cronbach's alpha = 0.45; V. Happiness (Items 5, 11, 17, 23 and 29) Cronbach's alpha = 0.53; and VI. Intellectual status (Items 6, 12, 18, 24 and 30) Cronbach's alpha = 0.53 (*tables 2 and 3*).

Table 2. Means of scale, variations of scale, total correlation of the item, Cronbach's alpha if the item were deleted from the PHCSCS. Paraíba, Brazil. 2022

Item	Mean total if item were deleted	Variance if item were deleted	Total correlation of item	Cronbach's alpha if item were deleted
1	113.17	326.45	.20	.79
2	112.36	314.00	.42	.78
3	112.92	322.42	.25	.78
4	112.96	314.90	.37	.78
5	11186	319.59	.38	.78
6	112.29	322.43	.32	.78
7	113.13	317.69	.31	.78
8	112.81	313.94	.44	.77
9	112.21	326.80	.19	.79
10	112.56	324.54	.22	.78
11	111.99	320.30	.30	.78
12	112.91	318.56	.37	.78
13	113.79	323.72	.24	.78
14	112.21	323.23	.26	.78
15	113.19	319.16	.32	.78
16	112.24	319.51	.32	.78
17	112.03	315.45	.43	.78
18	113.28	321.38	.19	.79
19	113.14	324.78	.21	.78
20	112.55	314.00	.43	.78
21	111.91	321.24	.37	.78
22	112.62	313.62	.39	.78
23	113.30	329.80	.13	.79
24	113.50	321.81	.28	.78
25	113.37	330.35	.11	.79
26	112.72	328.90	.17	.79
27	111.82	328.12	.21	.78
28	112.65	322.39	.22	.78
29	113.40	307.65	.49	.77
30	113.25	314.50	.37	.78

Source: The authors.

Table 3. Factor loading for six-factor solution of PHCSCS. Paraíba, Brazil. 2022

Item	Factor I	Factor II	Factor III	Factor IV	Factor V	Factor VI
Item 1 – I am often afraid.	.606					
Item 4 – I feel that I am left out (excluded) from things	.566					
Item 7 – I cry easily	.683					
Item 13 – I am nervous	.642					
Item 19 – I get nervous when the teacher calls on me	.475					
Item 25 – I am shy	.359					
Item 29 – I am often sad	.620					
Item 2 – I am good-looking		.722				
Item 8 – I have a pleasant face		.728				
Item 10 – I am one of the last to be chosen for games and sports		.328				
Item 14 – I have nice hair		.634				
Item 20 – My appearance bothers me		.449				
Item 5 – I am happy			.743			
Item 11 – I am unhappy			.623			
Item 17 – I am cheerful			.724			
Item 3 – I often get into trouble				.675		
Item 9 – I get into fights a lot				.702		
Item 16 – My classmates make fun of me				.568		
Item 27 – I behave badly at home				.407		
Item 15 – I get distracted during class at school					.614	
Item 21 – I do many bad things					.454	
Item 22 – I find it hard to make friends					.479	
Item 28 – In games and sports, I watch instead of play					.492	
Item 30 – I forget what I learn					.567	
Item 6 – I am good in my schoolwork						.426
Item 12 – My classmates in school think I have good ideas						.492
Item 18 – I can give a good presentation in front of my class						.392
Item 23 – I am lucky						.628
Item 24 – I am an important person in my class						.647
Item 26 – I am strong						.348

Source: The authors.

Factor I: Anxiety; Factor II: Physical appearance; Factor III: Behavioral adjustment; Factor IV: Popularity; Factor V: Happiness; Factor VI: Intellectual status.

Regarding divergent validity, associations were found between the BR-PHCSCS and some sociodemographic variables. Scores were significantly lower in adolescents who attended public school (p = 0.033), those in families with more than two children (p = 0.027), those whose guardian had up to a complete primary school education (p = 0.008) and those whose family income was up to the monthly minimum wage (p = 0.018) (*table 1*).

Spearman's correlation test was used for the assessment of convergent validity. BR-PHCSCS scores were negatively correlated with the DASS-21 scores (*rs* = -0.575, p < 0.001), demonstrating a statistically significant moderate correlation. The assessment of predictive validity revealed no statistically significant associations between the BR-PHCSCS scores and the presence of active caries (p = 0.24) or the need for orthodontic treatment (p = 0.51), but an association was found with the presence of anterior spacing (diastema) (p = 0.04) (*table 4*).

Table 4. Mean (± SD) PHCSCS scores according to dental caries and Aesthetic Dental Index (DAI). Paraíba, Brazil. 2022

Variables		n (%)	PHCSCS Mean (± SD)	*p-value*
Presence of caries	No	66 (20.3)	119.33 (17.52)	.243
	Yes	259 (79.7)	116.08 (18.56)	
Cavitated lesion	No	126 (38.8)	118.37 (17.64)	.205
	Yes	199 (61.2)	115.71 (18.79)	
Caries in anterior region?	No	112 (34.5)	118.56 (17.49)	.195
Presence of caries	Yes	213 (65.5)	115.78 (18.79)	
Number of cavitated teeth	Up to 2 teeth	223 (68.6)	116.76 (18.62)	.892
	More than 2 teeth	102 (31.4)	116.70 (17.89)	
Final DAI score	Up to 25 (no orthodontic treatment need)	319 (98.2)	116.83 (18.48)	.510
	+ 25 (orthodontic treatment need)	6 (1.8)	111.83 (10.53)	
Diastema in upper midline	No	222 (68.3)	118.16 (18.00)	.040
	Yes	103 (31.7)	113.67 (18.87)	

Source: The authors.

Discussion

The Brazilian version of the PHCSCS has adequate psychometric properties, following the characteristics of the original questionnaire developed in English. This scale had a Cronbach's alpha coefficient of 0.79, which is similar to that found for the original scale (0.90)[1], as well as the versions validated in Portugal (0.87)[12], Greece (0.86)[27] and Taiwan (0.93)[28]. Measures with $\alpha \geq 0.70$ are considered acceptable[24].

The ICC was calculated for the Brazilian version of the PHCSCS, which demonstrated

excellent temporal stability (0.97), even better than that found in other validation studies of the scale[13,14,29]. Temporal stability is an important aspect to ensure an absence of changes in the construct measured. Studies that validated the PHCSCS in Greece[27] and Taiwan[28] performed this assessment, but only the last one described the overall stability result (0.87), which was considered moderate to strong. Other studies, such as the one conducted in Portugal[12], did not assess temporal stability, which limits the comparison of our findings.

In the discriminant validity assessments, a statistically significant association was found between adolescents who attended public school and a lower self-concept score as previously reported[30]. Moreover, the self-concept score was significantly higher among students whose parents had a maximum of two children, high school education or higher, and an income higher than the monthly minimum wage. Individuals in situations of social disadvantage tend to experience an accentuated sensation of psychological suffering[31,32], and adolescents from families with more than five children are more likely to have mental health challenges[33]. Our findings show that socioeconomic factors can exert an influence on the self-concept level of adolescents, whose impact may begin in childhood and promote lower academic self-efficacy[34].

In terms of convergent validity, a moderate negative correlation was found between the scores of the Brazilian version of the PHCSCS and the DASS-21. Adolescents with a higher level of anxiety are more likely to have a negative perception of their self-concept[35]. Neuroeconomic, cognitive, and social accounts suggest a heightened sensitivity during adolescence to reward perception in decision-making, including identity formation and autonomy. Self-esteem and social support are related to health awareness and serve as motivation for healthy behaviors[36,37].

With regard to predictive validity, an association was found between upper midline diastema and a lower self-concept score. Individuals with poor tooth aesthetics and dental problems use strategies to avoid smiling[38], which would explain the lower self-concept level found in the present study. However, the hypothesis of a relationship between self-concept and orthodontic treatment need was not confirmed, which may be explained by the fact that the larger part of the sample was composed of individuals at the onset of adolescence. Self-esteem seems to minimize the perception of orthodontic treatment need in individuals with minor malocclusion[39] and older adolescents with more accentuated occlusal disorders have worse quality of life[40].

Although associations between self-concept and dental caries experience and caries on anterior teeth were nonsignificant, adolescents with these conditions had lower self-concept scores. Children with anterior tooth decay exhibit a higher propensity to avoid smiling[41], which may reflect into lower self-esteem and self-concept. A possible explanation for the lack of a significant association is that the scale may not be sensitive enough to assess dental conditions, but rather deeper existential issues.

EFA revealed multidimensionality of the Brazilian version of the PHCSCS, indicating a six-factor solution as the most adequate. Previous studies found similar results, as in the versions validated in Taiwan[28], Portugal[12] and Greece[27], with a satisfactory fit of the items in six factors.

Although the scale was not significantly associated with dental aesthetics or dental caries, the BR-PHCSCS seems to be a reliable, useful questionnaire for an in-depth analysis of the self-concept of adolescents. The literature has also shown that self-concept is linked to sedentary behaviors and family cohesion in adolescence[42,43], which highlights that BR-PHCSCS could be useful in other areas of research in the health field. The scale can also be employed to investigate the feelings experienced by adolescents and can contribute to the promotion of health actions directed at this population.

The Brazilian version of the PHCSCS represents a significant advance for both research and clinical practice involving adolescents. In the scientific realm, it offers a valid, reliable instrument to assess self-concept in Brazilian adolescents, enabling more precise and comparable studies on the development of self-concept and its relationship with other constructs. Its ease of application and understanding enables adolescents to reflect on their self-image, stimulating self-observation and self-knowledge.

In clinical and educational settings, the PHCSCSV1-6 can be used as a screening tool and complementary diagnostic assessment, assisting in the identification of adolescents with low self-esteem or difficulties related to self-concept. The scale provides valuable information for planning individualized or group therapeutic and psychoeducational interventions, aiming to strengthen self-concept and promote the emotional well-being of adolescents. In educational environments, the instrument can be used to identify students with adjustment difficulties or at risk of mental health problems, enabling the development of support programs and early interventions.

Some limitations of the present investigation should be discussed, such as the lack of studies that have tested the association between oral problems and self-concept, which limits our comparisons. Moreover, the scale did not exhibit sensitivity for the assessment of the oral health conditions investigated. The low participation of students from private schools was due to logistical issues, as few institutions agreed to participate, which was also a limitation of the study. Thus, a more accurate analysis of this construct is needed. Future studies should be conducted with other age groups and involving qualitative assessments to complement and expand the assessment of the convergent, divergent and predictive validities of this complex construct.

Conclusions

The self-concept of BR-PHCSCS was not associated with occlusal problems or caries experience. However, the scale demonstrated satisfactory psychometric properties for Brazilian adolescents aged 12 to 18 years and can be reliably used for other situations that exert an influence on the construct.

Collaborators

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