

Cross-Cultural Adaptation and Psychometric Properties of SATAQ-4R for Brazilian Adolescents

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Abstract

The aim of this study was to culturally adapt and to evaluate the psychometric properties of *Sociocultural Attitudes Towards Appearance Questionnaire – 4R* (SATAQ-4R) among Brazilian adolescents. This scale evaluates the influence from parents, peers, media and significant others on body image. In the first stage, the conceptual, semantic, operational and content equivalences were assessed. In the second stage, 285 girls ($M_{\text{age}} = 15.54$; $SD = 1.59$ years old) and 323 boys ($M_{\text{age}} = 15.34$; $SD = 1.66$ years old) took part. The results from Exploratory Factor Analysis showed a factorial structure composed of 7 factors for girls and 6 factors for boys. Associations between SATAQ-4R and body dissatisfaction, body change behavior, eating attitudes and self-esteem suggested good convergent validity. We concluded that the SATAQ-4R is a valid and reliable instrument for Brazilian adolescents, which is considered a good tool for the evaluation of the beauty ideal internalization and socio-cultural influences.

Keywords: Body image, Cultural Characteristics, Psychometrics, Validation Studies, Questionnaires

Adaptação transcultural e avaliação psicométrica do SATAQ-4R para adolescentes brasileiros

Resumo

O objetivo deste estudo foi adaptar culturalmente e avaliar as propriedades psicométricas do *Sociocultural Attitudes Towards Appearance Questionnaire – 4R* (SATAQ-4R) entre adolescentes brasileiros. Essa escala avalia influência dos pais, amigos, mídia e pessoas próximas na imagem corporal. Na primeira etapa, foram atestadas as equivalências conceitual, semântica, operacional e de conteúdo. Da segunda etapa, participaram 285 meninas ($M_{\text{idade}} = 15,54$; $DP = 1,59$ anos) e 323 meninos ($M_{\text{idade}} = 15,34$; $DP = 1,66$ anos). Os resultados da análise fatorial exploratória apontaram estrutura fatorial com sete fatores para meninas adolescentes e seis fatores para meninos adolescentes. Associações entre SATAQ-4R e medidas de insatisfação corporal, comportamento de mudança corporal, atitudes alimentares e autoestima sugerem boa validade convergente da escala. Conclui-se que o SATAQ-4R é um instrumento válido e confiável para adolescentes brasileiros, sendo alternativa para avaliação da internalização dos padrões ideais de beleza e influências socioculturais.

Palavras-chave: imagem corporal, características culturais, psicométrica, estudos de validação, questionários

Adaptación transcultural y evaluación psicométrica del SATAQ-4R para adolescentes brasileños

Resumen

El objetivo de este estudio fue adaptar culturalmente y evaluar las propiedades psicométricas del *Sociocultural Attitudes Towards Appearance Questionnaire – 4R* (SATAQ-4R) entre adolescentes brasileños. Esta escala evalúa la influencia de los padres, amigos, medios de comunicación y personas importantes en la imagen corporal. En la primera etapa, se atestiguaron las equivalencias conceptuales, semánticas, operativas y de contenido. En la segunda etapa, participaron 285 chicas ($M_{\text{edad}} = 15.54$; $DS = 1.59$ años) y 323 chicos ($M_{\text{edad}} = 15.34$; $DS = 1.66$ años). Los resultados del Análisis Factorial Exploratorio mostraron una estructura factorial de 7 factores para las chicas y 6 factores para los chicos. Las asociaciones entre el SATAQ-4R e insatisfacción corporal, la conducta del desarrollo corporal, las actitudes alimentarias y la autoestima sugieren una buena validez convergente. Se concluye que el SATAQ-4R es un instrumento válido para adolescentes brasileños y se considera una buena alternativa para la evaluación de la internalización de los ideales de belleza e influencias socioculturales.

Palabras clave: Imagen Corporal, Características Culturales, Psicométrica, Estudios de Validación, Cuestionarios

Introduction

In the last decade, researchers have pointed out an increase in body dissatisfaction among adolescents in Brazil (Laus et al., 2014). Adolescence is a stage of identity construction, which is very important for the creation of body image (Laus et al., 2014). Researchers are unanimous when they affirm adolescents are subject to social influence and present high levels of body dissatisfaction (Amaral & Ferreira, 2017; Laus et al., 2014). Furthermore, sociocultural influence is the main predictor of body dissatisfaction among Brazilian adolescents (Amaral & Ferreira, 2017), according to studies carried out in many cultural contexts (Cihan et al., 2016; Convertino et al., 2019; Schaefer et al., 2017; Stefanile et al., 2019).

The *Sociocultural Attitudes Towards Appearance Questionnaire* (SATAQ) is the most used questionnaire to assess sociocultural influence on body image (Schaefer et al., 2017). In its first version, the SATAQ analyzes the acceptance of socially established appearance standards through items that measure the internalization and the familiarization with those body ideals spread by the media (Heinberg et al., 1995). Cusumano and Thompson (1997) developed a revised version of SATAQ, with the aim of updating and enlarging the original questionnaire. The SATAQ-3, was suggested by Thompson et al. (2004) and adapted for different populations, including Brazilian adolescents (Amaral et al., 2015). This version analyzes the internalization of beauty standards and of athletic bodies, the pressure that they exert, and the media as a source of information about appearance.

More recently, Schaefer et al. (2015) proposed a new version of the questionnaire, which is consistent with the constructs suggested by *Tripartite Influence Model*. According to this model, there are three primary sources of influence on body image and eating disorders—parents, friends, and media—which affect individuals through internalization and social comparison mediator mechanisms (Thompson et al., 1999). Therefore, SATAQ-4 assesses the internalization of the thinness ideal (for women) and of muscularity (for men), as well as the pressure made by parents, friends, and the media on appearance.

The most recent version of this scale was revised with the aim to overcome four important limitations of the SATAQ-4: (1) elimination of the items related to the ideal of an athletic body, since they include other attributes besides physical appearance; (2) exclusion of

the items that referred to some sort of body change behavior, which permitted an assessment more focused on cognitive aspects; (3) inclusion of items related to the internalization of appearance ideals connected to attractiveness; (4) inclusion of items that assess the pressure made by close people, not only parents and friends (Schaefer et al., 2017). The so-called SATAQ-4R had its psychometric qualities proved among university students (men and women) and adolescent American girls (Schaefer et al., 2017); Turkish women (Cihan et al., 2016); Italian men and women (Stefanile et al., 2019); American sexual minorities (Convertino et al., 2019) and Asian Americans (Lim, 2018).

For the Brazilian population, recently, Claumann (2019) proved its psychometric properties among Brazilian women. As a result, there is still a need to validate this questionnaire for Brazilian adolescents. Considering the relevance of this scale on body image research and eating disorders, as well as the needed assessment of the sociocultural influence among adolescents, its availability to be applied for this population is essential. Therefore, this study has the objective to adapt the SATAQ-4R cross-culturally and assess its psychometric properties among Brazilian adolescent of both sexes.

Methods

Participants

In this study, 285 girls ($M_{\text{age}}=15.54$; $SD=\pm 1.59$ years old) and 323 boys ($M_{\text{age}}=15.34$; $SD=\pm 1.66$ years old) participated, who were recruited at public and private educational institutions in three cities from the Southeast of Brazil. Participants were adolescents aged between 11 and 19 years old, who accepted to participate voluntarily and were present at school on the day data were collected.

The sample size was calculated from Pasquali's recommendation (2010), which argues that the sample needs to be composed of, at least, 10 participants for each item of the scale. This estimation is widely used in national and international studies (Morgado et al., 2017).

Cross-Cultural Adaptation of SATAQ-4R

The cross-cultural adaptation of the scale for its use among adolescents and young Brazilians followed all the procedures recommended by the literature (Beaton et al., 2000; Reichenheim & Moraes, 2007). Such procedures establish carrying out two independent translations (from the original language to the target language), followed by a process of synthesizing both

translations. This synthesis is forwarded to two independent back-translators, who do not know the original instrument. They translate the scale back to its source language. As the last stage, all the instruments produced (translations, synthesis, and back translations) are analyzed by a committee of specialists, who analyze any inconsistencies and create the final version of the scale.

Therefore, after the written permission of the original instrument's author, we carried out the conceptual equivalence of the instrument through literature review (Reichenheim & Moraes, 2007). Next, the original female (SATAQ-4R-Female) and male (SATAQ-4R-Male) versions were translated from their source language (English) into their target language (Portuguese). Two bilingual translators, whose native language is Portuguese, translated the items independently. A synthesis of the translation was produced during a meeting, comparing the texts created by both translators. Two new translators, whose native language is English, back translated the scales into their original language.

Then, a committee of experts analyzed all the texts produced (translations, synthesis, and back translations) in order to reach a consensus about any possible discrepancies. This committee was composed of a linguist, five methodologists, two translators, and the two back translators. Specialists recommended that all items be written as affirmatives, removing all negative items (with reverse score). This change aimed to make items more easily understood by the target population, mainly adolescents. Furthermore, the committee of specialists came to the conclusion that, after translating the scale into Portuguese, some pairs of items were identical. In the female version, items 5 (*I think a lot about my appearance*), 9 (*I don't really think much about my appearance*) and 14 (*I don't think much about how I look*) were translated into: "I spend a lot of time thinking about my appearance.". Furthermore, items 3 (*I want my body to look very thin*) and 11 (*I want my body to look very lean*) were translated into: "I want my body to look very thin". Items 8 (*I want my body to look muscular*) and 10 (*I don't want my body to look muscular*) were translated into: "I want my body to look muscular." In the male version, items 6 (*I don't really think much about my appearance*) and 7 (*I don't think much about how I look*) were translated into: "I spend a lot of time thinking about my appearance."

Therefore, the specialists decided to keep items 3, 5, and 8 in the female version and item 6 in the male

version, excluding any repeated items. Consequently, the instrument versions analyzed in this study were composed of 27 items. The semantic, conceptual, and operational equivalences of the scale were approved by this committee, taking into account its relevance, format appropriateness, instructions, application of scales, and answer options.

Instruments

Sociocultural Attitudes Towards Appearance Questionnaire-4 Revised. We used the questionnaire versions after their cross-cultural adaptation stage for both girls (SATAQ-4R-Female) and boys (SATAQ-4R-Male). Participants gave their answers on a Likert Scale of scores, which varied from 1 (Totally Disagree) to 5 (Totally Agree).

Body Change Questionnaire (BCQ) We used the instrument's version that was validated for both male and female Brazilian adolescents by Meireles et al. (2015). The questionnaire assesses the frequency of adopting behaviors that affect body change through 48 items on a Likert Scale of scores, varying from 1 (Never) to 5 (Always). The BCQ is composed of the following subscales: Eating Habits; Food Supplements; Weight Loss Strategies; Weight Gain Strategies; Muscular Tone Gain Strategy; Muscle Size Gain Strategy. The score is calculated from the sum of all the answers. High values indicate higher frequency and adoption of body change strategies. Internal consistency values of the BCQ for the sample of this study were satisfactory, both for girls ($\alpha = .90$; $\omega = .84$) and for boys ($\alpha = .93$; $\omega = .94$).

Eating Attitudes Test-26 (EAT-26). The EAT-26 versions validated for girls (Bighetti et al., 2004) and boys (Fortes et al., 2016) were used to assess the eating attitudes of participants. The scale is composed of 26 questions that assess diets, bulimia, and concern about food and oral self-control. The answers are given on a Likert Scale, in which (3: always; 2: many times; 1: frequently; 0: few times, almost never, and never). Item 25 has reverse scoring. Total score varies from 0 and 78. Scores above 21 are considered disordered eating attitudes. The EAT-26 showed appropriate internal consistency for the sample of this study, for both girls ($\alpha = .83$; $\omega = .83$) and boys ($\alpha = .89$; $\omega = .89$).

Silhouette Scale (SE). This scale was used to assess body dissatisfaction. We used the version validated for Brazilian adolescents by Conti e Latorre (2009), composed of nine figures, whose weight and body size vary gradually from the thinnest one to the

heaviest one. Participants were asked which the figures represent their current body and the body they want to have. The difference between both figures represents body dissatisfaction. Positive values indicate the desire to reduce body size and negative values demonstrate the desire for a bigger body. In this study, we used absolute values (modulus) dissatisfaction to assess the convergent validity of SATAQ-4R.

Rosenberg Self-esteem Scale (RSES) The RSES version validated for Brazilians aged 10 to 30 years old by Hutz and Zanon (2011) was used to assess the global self-esteem of participants. It is composed of 10 items, with answers on a Likert Scale (from 1: totally disagree to 5: totally agree). The total score is calculated by the sum of the answers; the higher the value, the higher the participant's self-esteem. The RSES presented appropriate internal consistency among girls ($\alpha = .87$; $\omega = .87$) and boys ($\alpha = .83$; $\omega = .83$).

Procedures

In order to collect data among adolescents, initially, we got in touch with school directors in the cities of Rio de Janeiro (RJ), Juiz de Fora (MG), and Barbacena (MG), in order to explain the objectives of the study. After their permission, as well as the permission of the participants' parents, the adolescents were invited to participate in the study.

The Questionnaire application happened in classrooms during school time, and the answers were individual. There was no time limit to fill in the questionnaires. However, the average time for their completion was around 30 minutes.

Procedures adopted were approved by the Research and Ethics Committee for Research in Humans of the Federal University of Juiz de Fora (ruling number 1.942.868). Such procedures are also in accordance with Declaration of Helsinki and the rules number 466/12 from the National Health Council. All participants and/or their parents (in case they were minors) signed up the Free Consent Form, agreeing with their voluntary participation.

Data Analysis

At first, the data were analyzed descriptively (mean and standard-deviation). Mardia's test was carried out to assess its multivariate normality and it revealed non-normal distribution of data ($p < .001$).

Next, an Exploratory Factor Analysis (EFA) was performed in order to verify the construct validity of the scale. Two independent analyses were carried out:

one for the girls and another one for the boys. We chose to adopt the same procedure of the original instrument using, as extraction method, the Principal Axis Factoring (for non-normal data) and Promax rotation. We verified the appropriateness of the sample for the EFA through Bartlett's test of Sphericity ($p < .001$) and through *Kaiser-Meyer-Olkin* (KMO $> .6$) measure. The number of factors was determined based on statistics (*eigenvalue* > 1) and the theoretical framework. Factor charges of items were assessed and values above .35 were considered appropriate (Hair Júnior et al., 2009).

Moreover, the convergent validity (Spearman's correlation coefficient) of the total scores and SATAQ-4R subscales, of the total scores of EAT-26, of the SE, of the RSES, and of the total scores and subscales of the BCQ was assessed. For each of these correlations, we expected positive values, with significant ($p < .05$) and moderate to high results, except for the RSES, for which we expected negative values. Taking into account that such types of correlation are usually underestimated, we also presented the *rho* values corrected by measurement error attenuation, according to what is proposed by Fan (2003). Moreover, we assessed the reliability of Cronbach's Alpha (α) and of McDonald's Omega (ω) of SATAQ-4R and of its factors, for boys and girls.

The multivariate normality analysis was performed in RStudio v.1.2.1093. The EFA and the correlation analyses were performed in SPSS version 21.0, adopting significant levels of 95% ($p < .05$).

Results

Exploratory Factor Analysis

Factor Structure and Reliability of SATAQ-4R for Adolescent Girls

Bartlett's test of Sphericity was significant ($\chi^2 = 3496.380$, $gl = 325$; $p < .0001$) and *Kaiser-Meyer-Olkin* was .86, suggesting that the items were appropriate for the factor analysis. The items of the female scale were grouped into seven factors, similar to the original structure verified for American women (Schaefer et al., 2017), which explains 59.9% of the variance. The first factor grouped the items of the subscale "Pressure: Media" (items 24, 25, 26, and 27). Factor 2 represented the subscale "Pressure: Peers" (items 16, 17, 18, and 19) and factor 3 grouped items of the subscale "Internalization: Muscularity" (items 1, 3, 7, and 11). The fifth

factor grouped the items of the subscale “Internalization: Thinness/Low Body Fat” (items 5, 8, and 10) The items of the subscale “Internalization: General Attractiveness” were grouped in the sixth factor (items 2, 4, 6, and 9). The items of the original subscales “Pressure: Family” and “Pressure: Close People” were grouped into two different factors, one of them related to pressure to be slim or reduce body fat (Factor 4: items 12, 14, 15, 20, and 23) and the other is related to changes in physical shape or appearance (Factor 7: items 13, 21, and 22). These factors were called “Pressure for Thinness/Low Body Fat: Family and Close People” and “Pressure for the ideal appearance: Family and Close People,” respectively. Table 1 has the factor charges of each item.

The total scale presented appropriate internal consistency ($\alpha = .90$; $\omega = .89$), and also each of the SATAQ-4R-Female factors (Table 1).

Factor Structure and Reliability of SATAQ-4R for Adolescent Boys

We verified satisfactory values for Bartlett’s Sphericity Test ($\chi^2 = 4461.598$, $gl = 351$; $p < .0001$) and *Kaiser-Meyer-Olkin* (.89). The factor structure was composed by six factors, which explained 67.25% of variance (Table 2). Factor 1 grouped the items of the subscale “Pressure: Media” (items 22, 23, 24, 25, 26, and 27). Factor 2 grouped the items of the subscale “Pressure: Peers” (items 13, 14, 15, and 16) and item 17, originally from the subscale “Pressure: Close People.” The third factor represented the subscale “Internalization: Muscularity” (items 1, 3, 5, and 7) and item 6, which was originally from the subscale “Internalization: General Attractiveness.” This factor was called “Internalization: Muscularity/General Attractiveness.” Part of the items of the subscale “Pressure: Family” showed factor charge in factor 4 (items 9, 11, and 12). The remaining items of this subscale (items 8 and 10) were grouped into the fifth factor, together with items which originally belonged to the subscale “Internalization: Thinness/Low Body Fat” (items 2 and 4) and “Pressure: Close People” (item 19). This factor was called “Internalization/Pressure: Thinness/Low Body Fat,” for reflecting internalization and pressure items related to the slimness and physical shape. The last factor was composed of the items remaining from the subscale “Pressure: Close People” (items 18, 20, and 21).

The internal consistency of the questionnaire as a whole was appropriate ($\alpha = .91$; $\omega = .91$), as well as all the factors of SATAQ-4R-Male (Table 2).

Convergent Validity of SATAQ-4R for Adolescent Boys and Girls

In Table 3, the correlation values are measured among SATAQ-4R versions, including their factors and convergent measures. There was significant positive correlation with body change measures, eating attitudes and body dissatisfaction. There was negative correlation with self-esteem for adolescents of both sexes. Furthermore, Table 3 shows the correlation indexes among the subscales of SATAQ-4R versions and the BCQ subscales. Associations whose indexes are superior to .40 were found, which indicate moderate or strong correlations (Dancey & Reidy, 2013).

Discussion

This study had the objective of adapting the SATAQ-4R cross-culturally and assessing its psychometric properties among Brazilian adolescent of both sexes. SATAQ is internationally recognized as a useful instrument to assess the internalization of the beauty ideal items and of different sources of socio-cultural pressure (Schaefer et al., 2015; Schaefer et al., 2017). Therefore, the results of this study confirm the usefulness of this scale as a reliable and valid tool for evaluating the sociocultural influence on the target population.

Initially, the original version of the SATAQ-4R was translated and back translated from its source language (English) into its target language (Portuguese), and vice-versa. The committee of professionals pointed out the need to reduce the number of items, since some of them had identical translations, as well as transforming reverse items into affirmative sentences. Despite some possible answer bias, we believed this change would make it easy for adolescents to understand the items. The use of reverse items is frequently problematic, as exemplified in the study of psychometric assessment of SATAQ-3 for young Brazilians, in which reverse scoring items were grouped into an independent factor (Amaral et al., 2013).

As a result, the original female and male versions were composed of 31 and 29 items, respectively. After the cross-cultural adaptation, the number of items became 27 for both male and female versions. SATAQ-4R presented conceptual equivalence in all its items, as well as in its semantic and operational equivalence. It was, then, considered appropriate for psychometric evaluation.

Table 1.

Factor Loads for the Solution of Seven Factors of EFA of SATAQ-4R-Female for Adolescent Girls

Item	Pressure: Media	Pressure: Peers	Internalization: Muscularity	Pressure for Thinness/Low Body Fat: Family and Close People	Internalization: Thinness/Low Body Fat	Internalization: General Attractiveness	Pressure for Ideal Appearance: Family and Close People
24. I feel that the media pushes me to improve my physical shape.	.77						
25. I feel that the media pushes me to look thinner.	.93						
26. I feel that the media pushes me to improve my appearance.	.87						
27. I feel that the media pushes me to reduce my body fat.	.92						
16. My friends encourage me to become thinner.		.63					
17. I feel that my friends push me to improve my appearance.		.79					
18. I feel that my friends push me to improve my physical shape.		.78					
19. My friends push me to reduce my body fat.		.88					
1. It is important for me to look muscular.			.77				
3. I spend a lot of time thinking about being muscular.			.64				
7. I want my body to look muscular.			.91				
11. I would like to have a very muscular body.			.73				
12. I feel that my family pushes me to look thinner.				.51			
14. My family pushes me to reduce my body fat.				.90			
15. My family encourages me to improve my physical shape.				.80			
20. Close people encourage me to become thinner.				.52			
23. I feel that close people push me to reduce my body fat.				.38			
5. I spend a lot of time thinking about being thin.					.77		
8. I want my body to look very thin.					.66		
10. I spend a lot of time thinking about having low body fat.					.47		
2. It is important for me to look beautiful on my clothes.						.57	
4. I spend a lot of time thinking about my appearance.						.51	
6. I want to have a good appearance.						.66	
9. It is important for me to look attractive.						.42	
13. I feel that my family pushes me to improve my appearance.							.51
21. I feel that close people push me to improve my appearance.							.64
22. I feel that these close people push me to improve my physical shape.							.55
% Variance	28.8	8.61	7.96	5.57	3.96	2.66	2.32
Cronbach's Alpha	.92	.83	.81	.83	.71	.64	.75
McDonald's Omega	.92	.83	.82	.83	.71	.65	.76

Table 2.

Factor Loads for the Solution of Six Factors of EFA of SATAQ-4R-Male for Adolescent Boys

Item	Pressure: Media	Pressure: Peers	Internalization: Muscularity/ General Attractiveness	Pressure: Family	Internalization/Pressure: Thinness/Low Body Fat	Pressure: Close People
22. I feel that the media pushes me to improve my physical shape.	.80					
23. I feel that the media pushes me to look thinner.	.77					
24. I feel that the media pushes me to improve my appearance.	.82					
25. I feel that the media pushes me to reduce my body fat.	.78					
26. I feel that the media pushes me to become more muscular.	.92					
27. I feel that the media pushes me to increase the size or the definition of my muscles.	.91					
13. I feel that my friends push me to improve my appearance.		.98				
14. I feel that my friends push me to improve my physical shape.		.91				
15. I feel that my friends push me to become more muscular.		.69				
16. My friends encourage me to increase the size or the definition of my muscles.		.45				
17. I feel that close people push me to improve my appearance.		.49				
1. It is important for me to look muscular.			.85			
3. I spend a lot of time thinking about being muscular.			.54			
5. I want my body to look muscular.			.84			
6. I spend a lot of time thinking about my appearance.			.38			
7. I would like to have a very muscular body.			.62			
9. I feel that my family pushes me to improve my appearance.				.35		
11. I feel that my family pushes me to look more muscular.				.69		
12. My family encourages me to increase the size or the definition of my muscles.				.83		
2. I want my body to look very thin.					.39	
4. I spend a lot of time thinking about being thin.					.73	
8. I feel that my family pushes me to look thinner.					.41	
10. My family encourages me to improve my physical shape.					.27	
19. I feel that close people push me to reduce my body fat.					.43	
18. I feel that these close people push me to improve my physical shape.						.59
20. I feel that close people push me to become more muscular.						.74
21. I feel that close people push me to increase the size or the definition of my muscles.						.56
% Variance	32.27	11.63	8.19	6.24	5.01	3.91
Cronbach's Alpha	.93	.88	.78	.70	.62	.78
McDonald's Omega	.93	.89	.79	.71	.63	.78

Table 3.
Convergent Validity of SATAQ-4R for Adolescent Girls and Boys

	Eating Attitudes (EAT-26)	Body Dissatisfaction (SE)	Self-esteem (RSES)	Body Change (BCQ)	Eating Habits	Food Supplements	Weight Loss Strategy	Weight Gain Strategy	Muscle Tone Gain Strategy	Muscle Size Increase Strategy
Adolescent Girls										
SATAQ-4R-Female	.59**	.46**	-.47	.60**						
Pressure: Media	.43**	.33**	-.35	.37**	.13	.41**	.57**	.20*	.22**	.12
Pressure: Peers	.37**	.41**	-.26**	.43**	.12	.32**	.55**	.13	.23**	.12
Internalization: Muscularity	.49**	.29**	-.37**	.51**	.16*	.53**	.46**	.08	.33**	.30**
Pressure for Thinness/ Low Body Fat: Family and Close People	.54**	.48**	-.45**	.51**	.17*	.50**	.60**	.16*	.22*	.10
Internalization: Thinness/Low Body Fat	.51**	.22*	-.32**	.58**	.13	.56**	.37**	.07	.42**	.47**
Internalization: General Attractiveness	.59**	.40**	-.36**	.58**	.11	.60**	.49**	.05	.34**	.30**
Pressure for Ideal Appearance: Family and Close People	.36**	.36**	-.20*	.43**	.09	.41**	.48**	.11	.25**	.22*
Adolescent Boys										
SATAQ-4R-Male	.49**	.06	-.27**	.60**						
Pressure: Media	.35**	.06	-.13*	.35**	.23**	.24**	.29**	.02	.32**	.29**
Pressure: Peers	.36**	.04	-.14*	.46**	.27**	.43**	.26**	.14*	.40**	.32**
Internalization: Muscularity/ General Attractiveness	.34**	.01	-.09	.68**	.31**	.58**	.18*	.30**	.56**	.64**
Pressure: Family	.30**	.13*	-.20*	.33**	.09	.32**	.12	.20*	.36**	.31**
Internalization/Pressure: Thinness/Low Body Fat	.47**	.38**	-.27**	.38**	.16*	.32**	.61**	.12	.27**	.18*
Pressure: Close People	.34**	.08	-.17*	.43**	.16*	.47**	.27**	.15*	.42**	.38**

**p < .001; *p < .05

Note. Spearman's Correlation Coefficient (*r_{ho}*) corrected for attenuation of measurement errors.

Among girls, EFA presented a solution composed of seven factors, similar to the original structure found for American university students (Schaefer et al., 2017). The three original factors developed for types of internalization (“Internalization: General Attractiveness,” “Internalization: Muscularity” and “Internalization:

Thinness/Low Body Fat”) were kept. The same happened for the factors “Pressure: Peers” and “Pressure: Media.” In the other two factors, however, we determined that items were grouped considering the focus of the pressure, instead of the subject who makes pressure (family or close people). The factor “Pressure

for Thinness/Low Body Fat: Family and Close People” included items related to the pressure of family members and close people to become slim. Similarly, the factor “Pressure for Ideal Appearance: Family and Close People” covered items related to the pressure of having an ideal appearance, coming from family members and close people.

Given the differences from the original which were observed in these two factors, it seems that Brazilian adolescent girls better recognized the objective of the pressure than who is responsible for it (family or close people). Moreover, it seems that there is not a clear difference between the sources of influence: family, friends, and close people. This fact was also observed in the psychometric assessment of the scale for American adolescents, in which the subscales of friends and close people were grouped into one single factor (Schaefer et al., 2017), as well as for the version for Turkish women (Cihan et al., 2016).

The factor structure found for boys was composed of six factors. No other study assessed the psychometric qualities of SATAQ-4R for adolescent boys, which makes it difficult to compare it with other results obtained. The results of this study show similarities with the original version developed for young men (Schaefer et al., 2017), composed of seven factors.

Taking into account the factors related to internalization, the male version of SATAQ-4R has the following three internalization aspects: Muscularity, General Attractiveness, and Thinness/Low Body Fat (Schaefer et al., 2017). For adolescent boys, we verified that the only remaining item of the internalization factor of general attractiveness (item 6) was grouped with the factor related to muscularity, creating a new factor called “Internalization: Muscularity/General Attractiveness.” In the original version, only two items were related to the internalization of general attractiveness. For the cross-cultural adaptation stage, one of these items was deleted, since it presented an identical translation, as one factor cannot be composed of a unique item (Hair Júnior et al., 2009), it was necessary to group it into another factor.

The “Internalization/Pressure: Thinness/Low Body Fat” factor had not only internalization items related to thinness (items 2 and 4) but also items related to pressure from family (items 8 and 10) and from close people (item 19) for the same purpose. This fact shows that the internalization/pressure object (thinness/low body fat) was more relevant and considered the central element of the items, being determinant for this

grouping. This was also observed with Brazilian adolescent girls.

The factors for the four sources of pressure (“Pressure: Family”; “Pressure: Peers”, “Pressure: Close People” and “Pressure: Media”) were kept with a few differences in very specific items, when compared to the male original version (Schaefer et al., 2017). The factors “Pressure: Family” and “Pressure: Close People” kept most of their original items of the young males, but lost a few items to other factors. Item 10 (originally belonging to the factor “Pressure: Family”) and item 19 (originally belonging to the factor “Pressure: Close People”), as previously mentioned, had higher loads for the factors related to the internalization/pressure for thinness. The factor “Pressure: Peers” kept the four original items, except for the addition of one item (17), which originally belonged to the factor close people). This indicates that it is not possible to clearly define the sources of influence for boys, exactly as suggested in other studies (Cihan et al., 2016; Schaefer et al., 2017). Finally, the factor “Pressure: Media” in this study had exactly the same items of the original structure (Schaefer et al., 2017).

Regarding the factor structures for boys and girls, the consistency of the factor connected to the Media Pressure deserves attention. These were the only items that were grouped exactly as in the original study. Especially for the Brazilian population, the influence of the media on body image has been strong among adolescents (Amaral & Ferreira, 2017) and is considered one of the most important sources of pressure about appearance in the Brazilian context.

When it comes to the reliability of the SATAQ-4R, we found good values of internal consistency (Cronbach’s Alpha and McDonald’s Omega, which varied from .64 and .92 for girls and from .62 and .93 for boys). One of the most important indicators of the quality of a scale is its internal consistency (Hutz et al., 2015). This assessment indicates that the items measure the same construct and, consequently, are correlated (Hair Júnior et al., 2009). Some authors establish parameters for interpreting reliability values: above .60 they are considered appropriate; close to .80, they are considered good; and above .90 they are considered excellent (Hair Júnior et al., 2009; Hutz et al., 2015). As a result, we can affirm that all the factors presented appropriate to excellent internal consistency.

When it comes to convergent validity, the SATAQ-4R versions pointed out in the cross-cultural adaptation presented significant correlations with

measures theoretically associated. Participants with higher scores in SATAQ-4R also presented higher scores for adopting body change behaviors, body dissatisfaction, risky eating attitudes, and low self-esteem. Similarly, the factors of each of the proposed versions (for boys and girls) presented significant correlations with these measures. These discoveries corroborate previous studies, which pointed out the relation between the SATAQ and body change behaviors (Yamamiya et al., 2016), body dissatisfaction (Cihan et al., 2016; Schaefer et al., 2017), eating behavior, and self-esteem (Cihan et al., 2016; Stefanile et al., 2019).

Furthermore, we correlated the factors found for SATAQ-4R with BCQ subscales. The results found for boys were especially interesting, because there were stronger associations between the factor “Internalization: Muscularity/General Attractiveness” and the subscales of food supplements, muscle tone gain strategies, and muscle size increase strategies. Furthermore, the factor related to thinness (“Internalization/Pressure: Thinness/Low Body Fat”) also presented moderate and significant correlations with the BCQ’s strategy for weight loss subscale. Among girls, on the other hand, the correlation between the factor “Pressure for Thinness/Low Body Fat: Family/Close People” and the adoption of strategies of weight loss called our attention. The associations found were coherent with the factor structures pointed out. Similarly, Yamamiya et al. (2016), when validating the scale for Japanese adolescents, identified moderate associations between the strategies of weight loss (BCQ) and the subscales of SATAQ-4 related to thinness/Low Body Fat. Therefore, these results attest the convergent validity of SATAQ-4R for Brazilian adolescents of both sexes.

Despite its contributions, this study also has limitations. First, we must mention the difficulty of comparing the versions assessed in this study with validated scales in other countries, due to the difference in the number of items when compared to the original scale. However, the process of cross-cultural adaptation has the objective of creating an instrument to be used with the target population of a different culture, which may cause the exclusion of some items and changes in the application techniques, among others (Beaton et al., 2000; Reichenheim & Moraes, 2007). This process was carefully performed until it arrived at the version proposed in this study. Furthermore, due to the sample size of this study, it was not possible to conduct Confirmatory Factor Analysis, since it would

be necessary to include new participants, respecting the 10:1 recommended proportion. We suggest that future studies perform this analysis in order to prove the questionnaire’s external validity. It is argued, however, that the EFA is the most used technique to assess the validity of constructs on scales (Morgado et al., 2017). It is considered effective for the identification of the latent variables of a measure, through exploring the relations among the variables observed. Finally, socioeconomic variables were not evaluated, which would permit a better description of this study sample.

Despite the limitations mentioned above, this study represents a considerable advance for the fields of body image research and body image interventions. This study presents a valid and reliable instrument for assessing the sociocultural influence on the Brazilian context, together with international studies that tried to incorporate other forms of influence to those assessed by previous versions of SATAQ (Cihan et al., 2016; Convertino et al., 2019; Lim, 2018; Schaefer et al., 2017; Stefanile et al., 2019). The assessed parameters achieved the recommended values, which confirm the validity and the reliability of the questionnaire versions (SATAQ-4R-Female and SATAQ-4R-Male) for assessing the internalization of standards of beauty ideals and sociocultural pressure in Brazilian adolescents of both sexes.

We think that SATAQ-4R, both in its female and male versions, is appropriate for use in Brazilian adolescents. Given the importance of this instrument for the international environment and considering that the body image is strongly influenced by sociocultural factors, the availability of its most current version is relevant, not only for providing support to the clinical context, but also for elaborating and following up preventive programs.

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