ARTIGO DE INVESTIGAÇÃO

Portuguese adaptation of the Child Health and Illness Profile, Child Edition (CHIP-CE)

Adaptação portuguesa do Child Health and Illness Profile, Child Edition (CHIP-CE)

Adaptación portuguesa del perfil de salud infantil (Child Health and Illness Profile, Child Edition, CHIP-CE)

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Abstract

Background: Valid and comprehensive instruments that allow us to obtain self-reports of children's health and health-related behaviour are invaluable for understanding health and illness trajectories, for health resource planning and for evaluation of policy.
Aim: The aim of this study was to describe the process of adapting the Child Health and Illness Profile, Child Edition (CHIP-CE), a self-report health status instrument for children aged 6 to 11 years, to Portuguese (Riley *et al.,* 2004).
Method: After consensual translation by experts, the CHIP-CE was administered to 255 pupils, mean age 9.93 years, and its internal consistency, construct validity and concurrent validity were evaluated.
Results: The CHIP-CE Portuguese version had good internal consistency. Cronbach's alpha coefficient was 0.83 for Satisfaction, 0.79 for Comfort, 0.67 for Resilience, 0.71 for Risk avoidance, 0.77 for Achievement and 0.88 for the total scale. Factor analysis showed a five-factor structure: Satisfaction, Comfort, Resilience, Risk avoidance and Achievement. This was similar to the original version, explaining 40.83% of the total variance. All Satisfaction and Comfort items had factor loadings on their respective domains of at least 0.30, except for 7 items.
Conclusions: The properties of the CHIP-CE Portuguese version demonstrate its value for measuring children's perceptions of their own health and well-being.

Keywords: child; child welfare; health profile.

Resumo

Enquadramento: Instrumentos válidos e abrangentes que permitam obter o auto-relato de saúde e de comportamentos relacionados com a saúde das crianças são de grande valor para compreender a saúde e as trajectórias de doença, para o planeamento de recursos e para a avaliação de políticas nesta área.
Objectivo: O objectivo deste estudo é descrever o processo de adaptação para o Português do Child Health and Illness Profile, Child Edition (CHIP-CE), instrumento de auto-relato do estado de saúde de crianças com idades compreendidas entre os 6 e os 11 anos de idade (Riley *et al.,* 2004).
Método: Após tradução consensual por peritos, o CHIP-CE foi aplicado a estudantes (n = 255) com idade média de 9,93 anos. Foram medidas a coerência interna, validade de construto e validade.
Resultados: A versão Portuguesa do CHIP-CE revelou boa consistência interna. O alpha de Cronbach para a Satisfação foi de 0,83; 0,79 para Conforto; 0,67 para a Resiliência; 0,71 para Evitamento de Riscos; 0,77 para a Realização e 0,88 para a Escala Total. A análise factorial mostra uma estrutura de cinco factores: Satisfação, Conforto, Resiliência, Evitamento de Riscos e Realização, semelhante à versão original e explicando no total 40,83% da variância total. Todos os itens de satisfação e conforto tiveram carga factorial nos seus respectivos domínios de pelo menos 0,30, à excepção de 7 itens.
Conclusões: As propriedades da versão Portuguesa do CHIP-CE certificam a sua qualidade para medir a percepção das crianças acerca da sua própria saúde e bem-estar.

Palavras-chave: criança; bem-estar da criança; perfil de saúde.

Resumen

Encuadramiento: Instrumentos válidos y abarcadores que permitan obtener el autorelato de salud y de comportamientos relacionados con la salud de los niños son de gran valor para comprender la salud y las trayectorias de enfermedad, para el planeamiento de recursos y para la evaluación de políticas en esta área.
Objetivo: El objetivo de este estudio es describir el proceso de adaptación al portugués del Health and Illnes Profile, Child Edition, CHIP-CE, instrumento de autorelato del estado de salud de niños con edades comprendidas entre los 6 y los 11 años de edad (Riley *et al.,* 2004).
Método: Posteriormente a la traducción consensual por expertos, o CHIP-CE fue aplicado a estudiantes (n = 255) con edad media de 9,93 años. Fueron medidas la coherencia interna, la validad de constructo y la validad.
Resultados: La versión portuguesa del CHIP-CE reveló buena consistencia interna. El alfa de Cronbach para la Satisfacción fue de 0,83; 0,79 para Comodidad; 0,67 para a Resiliencia; 0,71 para Evitar de Riesgos; 0,77 para la Realización y 0,88 para la Escala Total. El análisis factorial muestra una estructura de cinco factores: Satisfacción, Comodidad, Resiliencia, Evitar de Riesgos y Realización, semejante a la versión original y explicando en total 40,83% de la variancia total. Todos los ítems de satisfacción y comodidad tuvieron carga factorial en sus respectivos dominios de por lo menos 0,30, a excepción de 7 ítems.
Conclusiones: Las propiedades de la versión Portuguesa del CHIP-CE certifican su calidad para medir la percepción de los niños acerca de su propia salud y bienestar.

Palabras clave: niño; bienestar infantil; estado de salud

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Introduction

Obtaining children's reports of their health and health-related behaviour is increasingly becoming recognized as critical for health resource planning, evaluation of policy and understanding health and illness trajectories, since they are expected to be predictive of future health outcomes (Riley *et al.,* 2004). Children have unique perspectives on their own health and may be able to provide important information to healthcare professionals, health planners and health policy-makers (Rebok *et al.*, 2001).

Obtaining children's own reports of their health and health-related behaviour involves only one respondent and eliminates the possibility of parents under-reporting their child's emotional problems (Riley *et al.,* 2004). Rebok *et al.* (2001) carried out a study in which they concluded that children as young as 8 years are able to report on all aspects of their health experiences, and children aged 6-7, although having difficulty with some health-related terms, can understand the basic task requirements and are able to report on their health experiences.

The studies by Riley *et al.* (2004) demonstrate that elementary school-aged children have a greater capacity for reliably reporting on their health than previously accepted.

Several instruments that allow children to report perceptions of their health and well-being have been developed. The Child Health and Illness Profile, Child Edition (CHIP-CE), developed by Riley *et al*. (2004), is an alternative for children, 6 to 11 years old, to report their own health and well-being in important domains such as Satisfaction, Comfort, Resilience, Risk avoidance and Achievement. Although no single domain score effectively describes a child's health, the pattern of scores reflects the complexity of child health and provides a measure of the state of health across the interrelated domains.

Some instruments that allow children to report their health and well-being perceptions have been validated for the Portuguese population. Among these we highlight: Kindel's scale, developed by M Bullinger and later reviewed by U Ravens-Sieberer and M Bullinger; the Dartmouth COOP Charts for Children (Nelson *et al.,* 1987); and the Health and Well Being Questionnaire (QBSE-C) (Rodrigues e Hawarylak, 2007).

Since a child's specific pattern of health may be predictive of future health outcomes, it is important to adapt the CHIP-CE to Portuguese . This article describes the process of adapting this instrument to Portuguese.

Methodology

An instrument's validity demonstrates the extent to which the instrument or empirical indicator measures what it is supposed to measure.

For the cross-cultural adaptation of the CHIP-CE, a methodology was adopted to test its measurement properties and equivalence in the new cultural context.

Initially, the CHIP-CE was translated to Portuguese by a specialist in education and by a bilingual English teacher, resulting in version 1. Both versions, i.e. the original and the first version, were compared, resulting in the second version of the CHIP-CE. The English-speaking specialists did the consensual validation by assessing and comparing the different versions in terms of semantic, idiomatic and conceptual equivalence of the item contents. When no consensus could be reached about the suggestions, the highest number of agreements among the judges was preferred. This resulted in the definitive version.

A pre-test was conducted with a sample of 15 children, who did not reveal any difficulty in understanding the content of the statements.

Reliability and construct validity were assessed. Internal consistency was analyzed through corrected item-total correlation and Cronbach's alpha for each scale. Construct validity was assessed through exploratory factor analysis using principal components with orthogonal varimax rotation.

Instruments

The CHIP-CE questionnaire (Riley *et al.,* 2004) is a paper-and-pencil self-report questionnaire designed for children aged 6-11 years.

It is a set of five-point (1-5) Likert type subscales for self-reporting, assessing the following domains: Satisfaction (9 Items) describes the child's assessment of his or her well-being and self-esteem; Comfort (12 items) assesses the degree to which the physical

domain and emotional symptoms and their associated activity limitations are endorsed by the child; Resilience (8 items) characterizes the child's states and behaviours that are likely to enhance future health. The interpersonal aspect of Resilience focuses on the supportive resources provided by the family, including activity items indicative of physical fitness; Risk avoidance (8 items) is the child's perception about how often s/he engages in behaviours that may be a risk to future health or development; Achievement (8 items) addresses how well the child feels s/he performs both academically and socially with peers.
In each item two cartoon illustrations that depict the appropriate extreme state of health are presented, and for each of them 5 possible response circles are given, graduated in size to indicate increasing/decreasing frequency or amount, with item wording placed beneath.
The result is obtained by adding the item scores for each of the five subscales. Higher scores indicate better health.

Sample and Procedures

Before starting data collection, the research project was approved by the Direcção Regional de Educação do Centro (DREC), the Portuguese Data Protection Authority and by the school Boards of each school where data were collected.
Parents received a description of the health assessment by mail and returned a stamped, addressed postcard if they did not want their child to participate.
Confidentiality of all data has been assured and no individuals can be identified.
The CHIP-CE was administered to a sample of 255 pupils attending classes in three schools in Central Portugal, two sub-urban (November 2006) and one urban (19 March, 2007).
Teachers received a 30m training before administering the CHIP-CE in class.
Participants were asked to mark the extent to which each statement applied to them during the past week. Help was available from the researchers and teachers to clarify any doubts.
Selection criteria: all children aged 6-11 years, present in the classroom at the time of data collection at the three schools who were able to understand CHIP-CE questions.

Data Analysis
Study sample characteristics

The study was carried out with 255 pupils, with a minimum age of 8 and maximum of 11 years (mean age 9.91 years and SD 1.04 years); 138 (54.12%) were boys and 117 (45.88%) were girls.
With regard to year of education, 40 pupils (15.69%) were in the third year; 46 (18.04%) were in the fourth year, 95 (37.25%) were in the fifth year and 74 (29.02%) were in the sixth year.

Results

Feasibility

Self-completion of the CHIP by 8 to 11 year olds required 25.2 minutes (range, 15-60 minutes).
Teachers administered the questionnaire to the class, in all grades, and this took less than 1 hour.
The visually informative format of the CHIP-CE/CRF and these procedures effectively assisted children who read poorly.
The rates of missing data were generally low. No teacher or student refused to participate or gave feedback indicating that they had problems in completing the instrument. Overall, 92.6% of the children said that they "liked a lot" or "liked" to answer the questions. Only 5.2% reported that they found the questions "hard" or "very hard" to answer.

Reliability analysis

CHIP-CE revealed strong internal consistency with corrected item-total correlations ranging between 0.20 and 0.64 for each subscale and total scale. Cronbach's alpha was 0.83 for Satisfaction, 0.79 for Comfort, 0.67 for Resilience, 0.71 for Risk avoidance and 0.77 for Achievement.

Construct validation

Factor analysis of the principal components with Varimax rotation (9-10) with Eigenvalues over 1 produced 12 factors explaining 59.83% of the total

variance. However, scree plot analysis revealed a factor break in factor number five.

The factor analysis forced for five factors (Satisfaction, Comfort, Achievement, Risk avoidance and Resilience) suppressing loadings over 0.25 is consistent with the original structure proposed by Riley *et al.* (2004), explaining 40.83% of total variance (Table 1).

TABLE 1 – Principal Component Analysis of CHIP-CE items

	Component				
	Satisfaction	Comfort	Achievement	Risk avoidance	Resilience
(31) How is your health?	.310	.416			
(32) How often do you really like yourself?	.583				
(33) How often do you feel happy?	.669				
(34) How often are you really proud of yourself?	.555				
(35) How often do you feel loved and wanted?	.414				
(36) How often do you have a lot of fun?	.640				
(37) How often do you really like the way you look?	.654				
(38) How often do you feel really strong?	.627				
(39) How often do you feel really healthy?	.553	.321			
(2) In the past 4 weeks, how often did you have a sore throat?		.592			
(3) In the past 4 weeks, how often did you have a bad stomach ache?		.668			
(4) In the past 4 weeks, how often did you have pain that really bothered you?		.618			
(5) In the past 4 weeks, how often did you have trouble breathing?		.346			.315
(6) In the past 4 weeks, how often did your skin itch all day?		.440			
(7) In the past 4 weeks, how often did you feel really sad?	.323	.505			
(8) In the past 4 weeks, how often did you cry a lot?		.494			
(9) In the past 4 weeks, how often did you feel really worried?		.528			
(10) In the past 4 weeks, how often did you feel grouchy?	.319	.334		.431	
(11) In the past 4 weeks, how often did you feel afraid?		.650			
(12) In the past 4 weeks, how often were you too sick to play at home?		.628			
(13) In the past 4 weeks, how often were you too sick to play outside?		.479			
(14) In the past 4 weeks, how often did you play active games or sports?			.321	-.396	
(26) In the past 4 weeks, how often did you get along well with your parents?					.573
(27) In the past 4 weeks, how often did your parents listen to your ideas?	.330				.526
(28) In the past 4 weeks, how often did your parents eat meals with you?					.582
(29) In the past 4 weeks, how often did your parents spend time with you doing something fun?					.569
(30) In the past 4 weeks, how often did you run hard when you played or did sports?			.332	-.442	
(45) How often is there an adult that you can go to for help when you have a real problem?					.500
(46) In the past 4 weeks, how often did you talk to your parents about what you are going to do the next day?					.640
(16) In the past 4 weeks, how often did you have trouble paying attention in school?		.305	.448	.276	
(17) In the past 4 weeks, how often did you get in trouble at school?				.497	
(18) In the past 4 weeks, how often did you pick on other kids?				.550	
(19) In the past 4 weeks, how often did you hang around with kids who get in trouble?				.427	
(25) In the past 4 weeks, that you were in school how often did you get along well with your teacher?					.547
(42) How often do you break rules just to see if you can get away with it?				.583	
(43) How often do you do something dangerous?				.702	
(44) How often have you told someone you are going to hurt them?				.602	
(15) In the past 4 weeks how did you do in your schoolwork?			.745		
(20) How good are you at making friends?	.481		.365		
(21) In the past 4 weeks that you were in school, how did you do in math?			.683		
(22) In the past 4 weeks that you were in school how did you do in reading?			.619		
(23) In the past 4 weeks, how good were you at remembering things you learned in school?			.731		
(24) In the past 4 weeks, how often did you finish your homework?			.441		
(40) How many friends do you have?	.557				
(41) How often do you get along well with your friends?	.517				

All items for Satisfaction and Comfort had factor loadings on their respective domains of least 0.30. Over 87% of the Satisfaction items loaded at 0.40 or higher, as did 91.6% of Comfort items.

However, 3 items of these two domains double-loaded: item "How is your health" in the Satisfaction domain loaded at 0.42 in Comfort; item "How often did you feel grouchy" of the Comfort domain loaded at 0.43 in Risk Avoidance and at 0.32 in Satisfaction and item "How often did you have trouble breathing", also from de Comfort domain, loaded at 0.32 in Resilience.

Six of 8 items for Resilience, Risk Avoidance and Achievement loaded between 0.40 and 0.74 on their respective domains. However, two items in each three domains loaded in a different domain.

Two Resilience items - "In the past 4 weeks, how often did you play active games or sports?" and "how often did you run hard to play or do sports?"- loaded respectively at 0.32 and 0.33 on Achievement.

The two Risk Avoidance items - "How often did you have trouble paying attention in school?" and "How often did you get along well with your teacher?" - loaded respectively at 0.45 on Achievement and at 0.55 on Resilience. The two Achievement items - "How many friends do you have?" and "How often did you get along well with your friends?" - loaded respectively at 0.56 and 0.52 on Satisfaction.

Intercorrelations of the domain scores ranged from 0.17 for Risk Avoidance and Resilience to 0.56 for Satisfaction and Achievement. This result indicates significant interrelationships between the domains but none sufficiently strong to suggest that the domains were overlapping.

Differences in health between genders

The data show differences only in Risk Avoidance, in which boys had a statistically significant lower mean (4.11) than girls (4.34) (Table 2).

TABLE 2 – Differences in health between genders (n=225)

	Gender	n	$\bar{x}$	s	t	p
Satisfaction	male	138	4.02	0.57	-1,01	0 ,31
	female	117	4.09	0.53		
Comfort	male	138	4.33	0.46	1,43	0 ,15
	female	117	4.25	0.51		
Achievement	male	138	3.82	0.64	-,97	0 ,33
	female	117	3.95	0.47		
Risk Avoidance	male	138	4.11	0.54	-3,59	0 ,00
	female	117	4.34	0.47		
Resilience	male	138	3.73	0.62	-1,79	0.07
	female	117	3.80	0.56		

Discussion

In the Portuguese version of CHIP-CE the 5 health domains are assessed by 45 items, as in the original version developed by Riley *et al.* (2004). Children require approximately 25 minutes to complete it on their own.

Teacher administration in classrooms worked very well and required less than one hour. Privacy was an important issue for many children and therefore needs to be addressed in group administration.

The Portuguese version of the CHIP-CE/Child Report Form, in accordance with the original version generated a profile of 5 domain scores, with a standardized mean of 50 and standard deviation of 10. The domain scores were 8 to 12 items long, too short to support separate scoring of the sub-domains. No single domain score described effectively a child's health, but the pattern of scores reflected the complexity of child health and provided a measure of the state of health across the interrelated domains.

The reliability of the domains, ranging from .67 to .83, was comparable with the results of Riley *et al.* (2004), which ranged from .70 to .82.

From a structural point of view, the five CHIP-CE domains were generally supported by the factor analysis and are comparable with Riley *et al.* (2004).

Items for Satisfaction and Comfort discriminate their domains but 2 items in each of the following domains - Resilience, Risk Avoidance and Achievement - loaded in a different domain.

Similar to these results, Riley's *et al.* (2004) research showed that the items "How many friends do you have?" and "How often did you get along well with your friends?" in Achievement domain, loaded respectively at 0.40 and 0.24 on Satisfaction and the items "In the past 4 weeks, how often did you play active games or sports?" and "How often did you run hard to play or do sports?" in Resilience domain loaded at 0.36 and 0.39 on Achievement.

In Riley's *et al.* (2004) study the two items in the Risk avoidance domain - "How often did you have trouble paying attention in school" and "How often did you get along well with your teacher?" - loaded on their respective domain but in the present study, in the Portuguese version, they loaded on Achievement and Resilience.

With regard to gender, there was no meaningful difference in the proportion of girls and boys of the sample.

The results showed differences between genders only in Risk Avoidance. Boys reported higher risks (lower Risk Avoidance scores), as predictable in accordance with the results of Riley *et al.* (2004). Similar results were found by Beitchman *et al*. (1989) in a study with children 6 to 13 years old, in which boys scored higher than girls on Conduct Problems, and also in the Starfield *et al.* (1995) study with adolescents 11-17 years old, in which boys engaged in more risky behaviours.

With regard to age there were no individuals in our study who were less than 8 years old.

Conclusion

The Portuguese version of the CHIP-CE/ Child Report Form appears to be equivalent to the original version developed by Riley *et al.* (2004).

In terms of internal consistency, correlation scores between the items and subscales to which they theoretically belong and Cronbach's alpha values guarantee the reliability of the scale.

Despite these results, the Portuguese version of the CHIP-CE revealed properties that demonstrate its ability to assess children's perceptions of their own health and well-being.

These results validate the use of the instrument with the Portuguese population. However, future researchers should focus on the structural discrepancies and also develop criterion validity studies.

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