Sleep Science

ORIGINAL ARTICLE

Validation of the Children Sleep Habits Questionnaire and the Sleep Self Report for portuguese children

Validação do Children Sleep Habits Questionnaire e do Sleep Self Report para crianças portuguesas

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ABSTRACT

This study provides validation of the Children Sleep Habits Questionnaire (CSHQ) and the Sleep Self Report (SSR) for Portuguese children, using community and clinical samples. The community sample included 574 parents, who fulfilled the CSHQ-PT, and 306 children (Age: M = 8.26; SD = 0.92) who answered the SSR-PT. The clinical sample included 60 parents, who filled the CSHQ-PT, and 30 children (Age: M = 8.73; SD = 1.14) who answered the SSR-PT. Concerning the CSHQ-PT, the community sample showed a total mean score of 43.83 (SD = 6.12), an internal consistency of 0.77, a test-retest reliability of 0.80, and the clinical sample showed a total mean score of 53.99 (SD = 10.43), and an internal consistency of 0.86. Comparisons between the community and clinical samples indicate statistical significant differences (z = -7.91, *p* = .000). A Receiver Operator Characteristic Curve (ROC) indicated a cut-off total score of 44 (sensitivity of 81%; specificity of 64%). Concerning the SSR-PT, the community sample showed a total mean score of 34.93 (SD = 5.71), internal consistency of 0.70, and the test-retest reliability of 0.75, and the clinical sample showed a total mean score of 39.87 (SD = 7.81), and internal consistency of 0.81. Comparisons between samples indicate statistical significant differences (z = -3.34, *p* = 0.001). Correlations between parents and children were statistically significant in 14 items of the community sample, and in 12 items of the clinical sample (in a total of 16 items). These results demonstrate that both questionnaires have good psychometric properties, and consistently differentiate the community and clinical samples. In accordance, they can be useful in screening sleep disturbances and habits in Portuguese school-aged children.

Keywords: child, questionnaires, sleep, validation studies.

RESUMO

Este estudo apresenta a validação do Children Sleep Habits Questionnaire (CSHQ) e do Sleep Self Report (SSR) para crianças portuguesas, usando amostras comunitárias e clínicas. A amostra comunitária incluiu 574 pais, que preencheram o CSHQ-PT, e 306 crianças (Idade: M = 8,26; DP = 6,12), que responderam ao SSR-PT. A amostra clínica incluiu 60 pais, que preencheram o CSHQ-PT, e 30 crianças (Idade: M = 8,73; DP = 1,14), que responderam ao SSR-PT. Relativamente ao CSHQ-PT, a amostra comunitária apresentou um resultado médio total de 43,83 (DP = 6,12), consistência interna de 0,77, e uma fiabilidade teste-reteste de 0,80, e a amostra clínica apresentou um resultado médio total de 53,99 (DP = 10,43), e consistência interna de 0,86. A comparação entre as amostras indicou diferenças estatisticamente significativas (z = -7,91, *p* = ,000). A curva ROC indicou um ponto de corte de 44 (81% sensibilidade; 64% especificidade). No que diz respeito ao SSR-PT, a amostra comunitária apresentou pontuação média total de 34,93 (DP = 5,71), consistência interna de 0,70, e fiabilidade teste-reteste de 0,75, e a amostra clínica apresentou pontuação média total de 39,87 (DP = 7,81), e consistência interna de 0,81. A comparação entre as amostras indicou diferenças estatisticamente significativas (z = -3,34, *p* = 0,001). As correlações entre pais e filhos foram estatisticamente significativas em 14 itens na amostra comunitária e 12 itens na amostra clínica (num total de 16 itens). Estes resultados evidenciam que os questionários apresentam propriedades psicométricas adequadas, diferenciando entre amostras clínicas e comunitárias. Assim, ambos são úteis na identificação de problemas e de hábitos de sono de crianças portuguesas em idade escolar.

Descritores: criança, estudos de validação, questionários, sono.

INTRODUCTION

Sleep is a critical issue in child development and its importance has been associated with a healthy physical, cognitive and behavioral development[1-3]. The prevalence of sleep disorders in children is between 25% and 40%[4,5]. Sleep influence on the subsequent adults' development of medical and psychological diseases (e.g., obesity, diabetes, hypertension and other cardiovascular problems, anxiety, and depression) has been demonstrated[3,6,7]. In Portugal, preliminary studies indicate the

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Received: October 24, 2013; Accepted: January 06, 2014.

existence of a high number of sleep complaints and deleterious sleep habits in children[8]. However, relatively few studies have addressed sleep habits in healthy school-aged children. Moreover, these studies evaluated children's sleep using a variety of instruments which made difficult a comparison between their results.

Surveys are a recognized method to evaluate sleep in large populations, but they imply valid, reliable and internationally accepted instruments[9,10]. There are several questionnaires to study children's sleep habits and problems[11,12]. The *Children's Sleep Habits Questionnaire* (CSHQ) and the *Sleep Self Report* (SSR) are examples of questionnaires internationally recognized as useful assessment instruments[13,14]. The CSHQ[13] is one of the most used around the world. Since its development in 2000 in the USA, it has already been translated, adapted and culturally validated to several countries, such as China[5], Israel[15], The Netherlands[16], and Germany[17]. Recently, it has also been published a study by Silva et al.[3], with a sample of 315 parents of Portuguese children aged between 2 and 10 years old. The CSHQ has proved to be an efficient method to screen sleep habits in school-aged children, from the parents' point of view.

The SSR[14] is a questionnaire addressed to assess sleep habits from the children's point of view. It was originally developed in the USA[14], and it has already been translated, adapted and culturally validated in The Netherlands in 2010[10], and also in Spain in 2012[18]. In the first two studies, children's results were compared to the parents' fulfillment of the CSHQ, and in spite of the low to moderate correlations, these instruments seem to be complementary to an accurate perception about sleep habits.

Literature on this domain indicates the need to assess and compare parental and children's perception about sleep problems, and previous studies demonstrate the existence of discrepancies between the two groups. Typically, children indicate more sleep problems than their parents believe. This may be related to a lack of a realistic perception from parents about their children's sleep, or to an absence of accuracy in the children's self description.

This study aims to provide validation of the Children Sleep Habits Questionnaire (CSHQ) and the Sleep Self Report (SSR) for Portuguese children, using community and clinical samples, and were named CSHQ-PT and SSR-PT, respectively[19,20].

METHOD

Study design

In the community sample participated a total of 4 urban and suburban schools in the Lisbon district. In March 2011, a total of 928 questionnaires were sent home, together with information on the study's goal, an informed consent, and a socio-demographic questionnaire. Response rate was 61.8%. The SSR-PT was answered in class, to minimize parental influence. All questionnaires were coded with a case number that allowed the linking between the child's and their respective parents' answers. A total of 574 questionnaires were considered for analysis after applying the following exclusion criteria: (a) more than 20% items unanswered, and (b) presence of diseases that could interfere with sleep (e.g., ADHD, anxiety, depression). The test-retest occurred in a total of 64 parents and 37 children, one month later, following the same ethical procedures.

In the clinical sample participated three different sleep centers, in order to assure different social backgrounds. As in the original study, three different pathologies were selected: (a) Sleep Related Breathing Disorder (SRBD), (b) Parasomnia, and (c) Behavioral Sleep Disorder. All children with SRBD made a type 1 full polysomnography according to international recommendations (AASM 2007), both for recording and visual scoring, using the Alice 5 Respironics® equipment. The clinical and polysomnographic (AHI > 1/h) norms for SRBD classification were used. The *International Classification of Sleep Disorder II*[21] was also used in the diagnosis of the two other groups.

The CSQH-PT took, approximately, 15 minutes to be answered, and the SSR-PT took, on average, 20 minutes to be completed.

Measures

After permission of the original author, both questionnaires were translated into Portuguese by two independent translators, and then revised by a sleep specialist. These preliminary versions were applied to ten parents and ten children, in order to identify ambiguity and inadequate terms. Both questionnaires were then re-translated by bilingual translators and revised again. The final version* was tested in a pilot study using the "think aloud method" in twenty parents and twenty children[22].

The CSQH is a parental questionnaire about a child's average sleep in the most recent typical week[13]. It is composed by 33 items, grouped in eight subscales: (a) Bedtime Resistance (BTR), (b) Sleep Onset Delay (SOD), (c) Sleep Duration (SD), (d) Sleep Anxiety (SA), (e) Night Wakening (NW), (f) Parasomnias (PS), (g) Sleep-Disordered Breathing (SDB), and (h) Daytime Sleepiness (DTS). There are 2 items (Item 5 and 8) that are common to the BTR and SA subscales. Answers are rated on a three-point Likert scale, in which 3 means "*Usually*", 2 means "*Sometimes*", and 1 means "*Rarely or never*". Items 1, 2, 3, 10, 11, 26 are scored in reverse. A total score can be obtained by summing up the scores of the 33 items, and 8 subscale's scores can be obtained by summing up their respective items. Higher scores indicate more sleep problems. The cut off in the original version is 41[13].

The SSR is a questionnaire designed for children between 7 and 12 years old. It is composed of 26 items[14], 23 of which are answered with a three-point Likert scale in which 3 means "*Usually*", 2 means "*Sometimes*" and 1 means "*Rarely or never*". From these, items 4, 5, 6, 8, 11 and 26 are scored in reverse. A total score can be obtained by summing up the scores of the 23 items, and higher scores indicate more severe sleep problems.

* The Portuguese versions of CSHQ-PT and SSR-PT are available at www.sonoescolas.com.

From these 23 items, 13 are common to the CSQH. A total score considering these 13 items was also computed to favor the cultural comparison.

Statistical analyses

The data was analyzed using the Statistical Package for Social Sciences for Windows version 20.0. Descriptive analyses were made, and internal consistency was assessed with Cronbach's alpha coefficients. A Receiver Operating Characteristic (ROC) curve was studied and a cut-off point was determined to the CSHQ-PT. Afterwards, both questionnaires were validated by comparing the community and the clinical sample's results, using a Mann-Whitney *U* Test. To analyze the correlation between parents and children's assessments, Spearman's correlations were computed to the subscale scores. Test-retest reliability was calculated using Pearson's correlations. Significance level was $p < 0.05$.

RESULTS

Participants

Parents' participants at the community sample were 574 who fulfilled the CSHQ-PT about their children, aged 7.2 years (SD = 1.5; Min = 4; Max = 10), 52.1% male. From these parents, 306 children, 155 (50.7%) male, with a mean age of 8.2 years (SD = 0.9; Min = 7; Max = 10) answered the SSR-PT. At the clinical sample, 60 parents fulfilled the CSHQ-PT about their children with a mean age 6.4 years (SD = 2.2; Min = 4; Max = 10). From these parents, 30 children, 15 (50%) male, with a mean age of 8.7 years (SD = 1.1; Min = 7; Max = 10) answered the SSR-PT.

Children's Sleep Habits Questionnaire (CSHQ-PT)

Descriptive statistics and internal consistency

Table 1 presents descriptive statistics and the internal consistency for items and subscales, for the community and clinical samples. The total score for the community sample ranged from 33 to 78 (M = 43.83; SD = 6.12). The following mean scores for the subscales were: BTR: 7.59 (2.21); SOD: 1.21 (0.49); SD: 3.52 (0.98); SA: 5.42 (1.73); NW: 3.68 (1.10); PS: 8.32 (1.59); SDB: 3.37 (0.79); DTS: 13.41 (2.72). For the clinical sample, the total score ranged from 37 to 80 (M = 53.99; SD = 10.43). The following mean scores for the subscales were: BTR: 8.87 (2.93); SOD: 1.62 (0.83); SD: 4.49 (1.70); SA: 6.50 (2.36); NW: 5.07 (1.73); PS: 10.75 (2.77); SDB: 5.12 (2.05); DTS: 14.80 (3.36). Mean scores are higher in the clinical sample, when considering the subscales, and also when considering the items. The exception is found on the item 26 "W*akes by himself*" (Community sample = 2.30 ± 0.73; Clinical sample = 2.17 ± 0.79).

For the community sample, the Cronbach's alpha for the 33 items was 0.77, and for the clinical sample, the Cronbach's alpha was 0.86. The subscales' Cronbach's alpha ranged from 0.54 (SDB) to 0.72 (BTR), for the community sample, and from 0.57 (NW) to 0.81 (SDB), for the clinical sample. A comparison between the obtained results in the community and the clinical samples indicates that the Cronbach's alpha of the CSHQ-PT is higher in the clinical sample. Considering each subscale, the results of the Cronbach's alpha are also higher in all of the clinical sample's subscales, except in the NW subscale.

Comparison of the CSHQ -PT scores between the community and clinical samples

Results indicated the existence of statistical significant differences between the two samples considering the total score ($Z = -7.91$, $p = 0.000$; Community sample = 43.83 ± 6.12; Clinical sample = 53.99 ± 10.43). As shown in Table 1, the comparison of the subscales between samples shows statistical significant differences on all subscales, with higher results in the clinical sample.

Cut-off point from a ROC curve

Similarly to the original study, sensitivity and specificity were examined using the ROC curve. A higher sensitivity was considered in order to avoid false negatives. Results indicate an intersect point of sensitivity and specificity of 44. Using this cut-off score, sensitivity was 0.81 and specificity 0.64. The area under ROC curve was 0.82. In the community sample, 42% of the children have a superior or equal score. In the clinical sample, 15% of the children had a lower score and would not be diagnosed using this cut-off.

Test-retest reliability

Test-retest reliability was assessed with 64 parents of the community sample. Results showed a positive correlation between the total score of both assessment moments, demonstrating that the higher the results at Time 1, the higher the results at Time 2 ($r = 0.80$, $p = 0.000$). Correlations for the subscales ranged from 0.45 ($p = 0.000$) in the NW subscale to 0.86 ($p = 0.000$) in the SDB subscale. Pearson' correlations for each of the subscales are presented in Table 2.

Sleep Self-Report (SSR-PT)

Descriptive statistics and internal consistency

Table 3 presents the items' descriptive statistics, for the community and clinical samples. For the community sample, the total mean score of the 23 items was 34.93 (SD = 5.71; Min = 24; Max = 55). For the clinical sample, the total mean score was 39.87 (SD = 7.81; Min = 26; Max = 56). Mean scores are also higher in the clinical sample when considering the items. Exceptions are found in the item 23 "Do you have trouble waking up in the morning" (Community sample = 2.04 ± 0.73; Clinical sample = 1.97 ± 0.81), and in item 25 "Do you take naps during the day" (Community sample = 1.15 ± 0.42; Clinical sample = 1.13 ± 0.43).

The internal consistency in the community sample, for the 23 items was 0.70, and for the clinical sample was 0.81 (see Table 3).

Comparison of the SSR-PT scores between the community and clinical samples

Results of the comparison of the community and clinical samples indicated the existence of statistical significant differences when considering the total score ($Z = -3.34$, $p = 0.001$; Community sample = 34.93 ± 5.71; Clinical sample = 39.87 ± 7.81). As shown in Table 4, the clinical sample has higher results than the community sample.

Table 1. Children's Sleep Habits Questionnaire-PT: descriptive statistics for items and subscales, and mean difference between the community and clinical samples.

CSHQ-PT	Community sample (n = 574)		Clinical sample (n = 60)		Z
Subscale/Item	Mean (SD)	Cronbach's α (if item deleted)	Mean (SD)	Cronbach's α (if item deleted)	
1. Bedtime Resistance	7.59 (2.21)	0.72	8.87 (2.93)	0.74	-3.45***
1	1.11 (0.34)	0.73	1.18 (0.47)	0.76	
3	1.35 (0.70)	0.60	1.58 (0.83)	0.67	
4	1.30 (0.61)	0.67	1.47 (0.68)	0.70	
5	1.39 (0.70)	0.63	1.60 (0.85)	0.68	
6	1.14 (0.42)	0.73	1.42 (0.70)	0.74	
8	1.30 (0.60)	0.66	1.62 (0.85)	0.64	
2. Sleep Onset Delay*	1.21 (0.49)	----------	1.62 (0.83)	----------	-4.68***
2	1.21 (0.49)	----------	1.62 (0.83)	----------	
3. Sleep Duration	3.52 (0.98)	0.61	4.49 (1.70)	0.75	-5.06***
9	1.14 (0.41)	0.59	1.45 (0.65)	0.57	
10	1.17 (0.43)	0.40	1.58 (0.77)	0.75	
11	1.22 (0.47)	0.52	1.46 (0.67)	0.44	
4. Sleep Anxiety	5.42 (1.73)	0.59	6.50 (2.36)	0.68	-3.51***
5	1.39 (0.70)	0.52	1.60 (0.85)	0.44	
7	1.55 (0.78)	0.56	1.93 (0.94)	0.42	
8	1.30 (0.60)	0.38	1.62 (0.85)	0.67	
21	1.18 (0.46)	0.59	1.35 (0.66)	0.34	
5. Night Wakening	3.68 (1.10)	0.59	5.07 (1.73)	0.57	-6.72***
16	1.29 (0.55)	0.41	1.58 (0.77)	0.47	
24	1.32 (0.59)	0.35	1.98 (0.83)	0.36	
25	1.07 (0.29)	0.61	1.50 (0.75)	0.32	
6. Parasomnia	8.32 (1.59)	0.55	10.75 (2.77)	0.69	-7.07***
12	1.09 (0.34)	0.57	1.28 (0.61)	0.01	
13	1.33 (0.54)	0.46	1.70 (0.72)	0.53	
14	1.40 (0.62)	0.43	2.20 (0.80)	0.51	
15	1.06 (0.24)	0.52	1.23 (0.56)	0.37	
17	1.20 (0.48)	0.59	1.33 (0.60)	0.24	
22	1.05 (0.25)	0.49	1.38 (0.64)	0.65	
23	1.20 (0.42)	0.49	1.62 (0.72)	0.53	
7. Sleep-Disordered Breathing	3.37 (0.79)	0.54	5.12 (2.05)	0.81	-8.67***
18	1.25 (0.52)	0.57	2.12 (0.85)	0.64	
19	1.06 (0.25)	0.47	1.57 (0.84)	0.70	
20	1.05 (0.25)	0.36	1.43 (0.72)	0.66	
8. Daytime Sleepiness	13.41 (2.72)	0.61	14.80 (3.36)	0.64	-2.89**
26	2.30 (0.73)	0.55	2.17 (0.79)	0.43	
27	1.38 (0.54)	0.57	1.51 (0.62)	0.41	
28	2.56 (0.70)	0.56	2.57 (0.72)	0.22	
29	1.70 (0.71)	0.51	1.95 (0.83)	0.71	
30	1.32 (0.55)	0.55	1.55 (0.83)	0.52	
31	1.28 (0.48)	0.61	1.62 (0.69)	0.16	
32	1.29 (0.66)	0.63	1.62 (0.89)	0.25	
33	1.59 (0.83)	0.60	1.83 (0.89)	0.08	
Total score	43.83 (6.12)	0.77	53.99 (10.43)	0.86	-7.91***

Cronbach's Apha was not calculated to the SOD subscale since it is composed by one item only; * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

Table 2. Test-retest reliability of the Children's Sleep Habits Questionnaire-PT in the community sample (n = 64).

CSHQ score (n = 64)	T1			T2			r
	Mean (SD)	Min-Max	α	Mean (SD)	Min-Max	α	
Bedtime Resistance	7.59 (2.22)	6-17	0.72	6.98 (0.18)	6-12	0.67	0.84***
Sleep Onset Delay	1.21 (0.49)	1-3	---	1.13 (0.45)	1-3	---	0.56***
Sleep Duration	3.52 (0.98)	3-9	0.61	3.31 (0.89)	3-7	0.66	0.76***
Sleep Anxiety	5.42 (1.73)	4-12	0.59	5.00 (1.55)	4-10	0.62	0.81***
Night Wakening	3.69 (1.10)	3-8	0.59	3.30 (0.66)	3-6	0.62	0.45***
Parasomnia	8.32 (1.59)	7-17	0.55	7.86 (1.27)	7-13	0.51	0.77***
Sleep-Disordered Breathing	3.37 (0.79)	3-9	0.54	3.22 (0.72)	3-8	0.66	0.86***
Daytime Sleepiness	13.41 (2.72)	8-22	0.61	12.77 (2.28)	8-20	0.54	0.61***
Total score	43.83 (6.12)	33-78	0.77	43.56 (5.58)	35-69	0.75	0.80***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

Table 3. Sleep Self-Report (SSR-PT): descriptive statistics for items and mean difference between the community and clinical samples.

SSR-PT	Community sample (n = 306)			Clinical sample (n = 30)			Z
Item	Mean(SD)	Cronbach's α (if item deleted)	Corrected item-total correlation	Mean (SD)	Cronbach's α (if item deleted)	Corrected item-total correlation	
4	1.42 (0.61)	0.69	0.23	1.47 (0.57)	0.80	0.28	
5	1.29 (0.50)	0.69	0.16	1.37 (0.56)	0.80	0.28	
6	1.38 (0.69)	0.69	0.20	1.60 (0.77)	0.79	0.48	
7	1.38 (0.64)	0.69	0.20	1.60 (0.77)	0.80	0.34	
8	1.58 (0.75)	0.69	0.24	2.00 (0.91)	0.79	0.49	
9	1.41 (0.63)	0.68	0.30	1.60 (0.72)	0.79	0.58	
10	1.49 (0.70)	0.68	0.28	1.67 (0.76)	0.80	0.35	
11	1.48 (0.66)	0.69	0.16	1.63 (0.77)	0.80	0.40	
12	1.92 (0.93)	0.70	0.17	2.13 (1.01)	0.81	0.15	
13	1.40 (0.72)	0.68	0.27	1.70 (0.79)	0.80	0.29	
14	1.27 (0.60)	0.68	0.30	1.61 (0.76)	0.79	0.67	
15	1.48 (0.72)	0.68	0.37	1.73 (0.87)	0.79	0.61	
16	1.65 (0.79)	0.68	0.31	1.83 (0.79)	0.79	0.52	
17	1.89 (0.84)	0.73	0.14	1.73 (0.78)	0.83	0.40	
18	1.50 (0.69)	0.67	0.41	2.07 (0.87)	0.79	0.61	
19	1.65 (0.79)	0.67	0.41	2.17 (0.87)	0.80	0.28	
20	1.75 (0.66)	0.69	0.27	2.06 (0.74)	0.80	0.34	
21	1.28 (0.56)	0.68	0.29	1.53 (.078)	0.79	0.51	
22	1.32 (0.58)	0.67	0.43	1.77 (0.86)	0.78	0.63	
23	2.04 (0.73)	0.68	0.28	1.97 (0.81)	0.82	0.03	
24	1.62 (0.70)	0.67	0.40	1.77 (0.73)	0.80	0.32	
25	1.15 (0.42)	0.69	0.19	1.13 (0.43)	0.81	0.15	
26	1.61 (0.76)	0.69	0.20	1.73 (0.79)	0.80	0.26	
Total score	34.93 (5.71)	0.70	----------	39.87 (7.81)	0.81	----------	-3.34***

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

Test-retest reliability

Test-retest reliability was assessed with 37 children of the community sample. Pearson's correlation of the 23 items (excluding items 1, 2 and 3) indicated a positive correlation between the total score, demonstrating again that the higher the results at Time 1, the higher the results at Time 2 (r = 0.75, $p = 0.000$; T1 = 33.67; T2 = 32.14).

Correlation of the CSHQ-PT/SSR-PT in the community and clinical sample

Spearman coefficients were used to study correlation between 16 of the parents' answers (CSHQ-PT) and 16 of the children's corresponding answers (SSR-PT).

For the community sample, there were identified statistically significant correlations between 14 items. The correlations

Table 4. Spearman's correlation between the CSHQ-PT and the SSR-PT in the community and clinical samples.

CSHQ-PT Item	SSR-PT Item	Community sample (n = 306)			Clinical sample (n = 30)		
		CSHQ-PT	SSR-PT Mean (SD) Mean (SD)	r_{sp}	CSHQ-PT Mean (SD)	SSR-PT Mean (SD)	r_{sp}
goes to bed at same time	bed at same time	1.10 (0.30)	1.43 (0.61)	0.17*	1.17 (0.46)	1.47 (0.57)	0.42*
falls asleep in other people´s bed	falls asleep in other people´s bed	1.28 (0.60)	1.38 (0.64)	0.40***	1.47 (0.64)	1.60 (0.77)	0.62***
fall asleep in 20 min	fall asleep in 20 min	1.19 (0.48)	1.58 (0.75)	0.18***	1.77 (0.90)	2.00 (0.91)	0.67***
struggles at bed time	fight about going to bed	1.10 (0.36)	1.41 (0.63)	0.09 n.s.	1.53 (0.73)	1.60 (0.72)	0.41*
afraid sleeping in the dark	afraid of the dark	1.47 (0.72)	1.34 (0.72)	0.28***	1.90 (0.96)	1.70 (0.79)	0.52**
afraid sleeping alone	afraid sleeping alone	1.28 (0.59)	1.27 (0.60)	0.32***	1.70 (0.92)	1.61 (0.76)	0.53*
sleeps too little	sleep too little	1.11 (0.37)	1.65 (0.79)	0.09 n.s.	1.57 (0.72)	1.83 (0.79)	0.22 n.s.
moves to other people´s bed	go to someone´s bed	1.23 (0.51)	1.32 (0.58)	0.28***	1.43 (0.723)	1.77 (0.856)	0.55**
hard time getting out of bed	trouble waking up in the morning	1.69 (0.71)	2.05 (0.73)	0.30***	2.07 (0.87)	1.97 (0.81)	0.70***
ready for bed	ready for bed usual bed time	2.55 (0.64)	1.48 (0.66)	-0.13*	2.20 (0.76)	1.63 (0.77)	-0.27 n.s.
needs special object	needs special object	1.57 (0.83)	1.91 (0.92)	0.48***	1.80 (0.93)	2.13 (1.01)	-0.79***
awakens during night	awakens during night	1.04 (0.19)	1.51 (0.69)	0.17**	1.47 (0.68)	2.07 (0.87)	-0.10 n.s.
pain during night	pain during night	1.10 (0.33)	1.28 (0.56)	0.20***	1.37 (0.61)	1.53 (0.78)	0.25 n.s.
Total score (13 items)	17.71 (6.63)	19.61 (8.87)	-----	21.45 (9.90)	22.91 (10.50)	-----	
falls asleep in own bed	fall asleep same bed*	1.34 (0.69)	1.29 (0.50)	0.18***	1.63 (0.85)	1.37 (0.56)	0.36*
needs parent in room to sleep	fall asleep alone*	1.35 (0.67)	1.38 (0.69)	0.50***	1.40 (0.77)	1.60 (0.77)	0.40*
alarmed scary dream	have nightmares*	1.17 (0.40)	1.75 (0.66)	0.21***	1.77 (.77)	2.06 (0.74)	0.55**

* $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$.

for those items ranged from -0.13 ($p = 0.025$) in the item "ready to bed at usual bed time" to 0.50 ($p = 0.000$) in the item "needs parent in room to sleep/fall asleep alone". Positive correlations indicate that parents and children have similar perceptions about sleep problems. The exceptions, with no significant correlations, were found in the "struggles at bed time/fight about going to bed" ($r_{sp} = 0.09$, $p = 0.115$) and "sleeps too little" ($r_{sp} = 0.09$, $p = 0.117$).

For the clinical sample, the Spearman's correlation showed a statistically significant correlation between 12 items, with correlation values ranging from -0.79 ($p = 0.001$) in the item "needs special object" to 0.36 ($p = 0.000$) in the item "fall asleep in own bed". The exceptions without significant correlations were found in the items "sleeps to little" ($r_{sp} = 0.22$, $p = 0.243$), "ready for bed" ($r_{sp} = -0.27$, $p = 0.157$), "awakens during night" ($r_{sp} = -0.1$, $p = 0.604$), and "pain during night" ($r_{sp} = 0.25$, $p = 0.185$). See Table 4.

DISCUSSION AND CONCLUSION

This study aimed to adapt, among a Portuguese sample, two assessment instruments of sleep habits in school-aged children.

The descriptive study of CSHQ-PT showed that scale's total score is superior in the clinical sample, situation which is also observed when considering the subscales or items. These results show that parents of the clinical sample identified a higher number of sleep problems in their children than those of the community sample. This situation may be due to the fact that sleep disorders impact negatively upon sleep and sleep habits. Comparing these results with those of international studies, the average scores for the total scale are higher in the USA study[13] and in the Israel study[15], and lower in German[17] and Chinese[5] studies. These results may reflect cultural differences in child care practices (e.g., parent-child room sharing, attitudes and sleep habits[5,15]).

Regarding internal consistency there were higher rates to the critical threshold of 0.70[23] in the total scale. However, these results are suboptimal, in most cases, when we consider the subscales of each sample, indicating the existence of some consistency problems for the Sleep-Disordered Breathing, Parasomnia, Night Wakening, Sleep Anxiety, Sleep Duration and Daytime Sleepiness subscales, in the community sample, and for the Night Wakening, Daytime Sleepiness, Sleep Anxiety, and Parasomnia subscales, in the clinical sample. Results

regarding Cronbach's alpha were higher for the clinical sample, considering the total scale and the majority of subscales. These results are consistent with those reported in several studies: Cronbach's alpha were between 0.68 in the USA and German studies[13,17], 0.78 in another Portuguese study[3], and 0.81 in the Hebrew study[15]. In the USA study[13], Cronbach's alpha in the clinical sample is higher than in the community sample (0.78 versus 0.68).

By establishing the ROC Curve considering a sensitivity of 81% and a specificity of 64%, a cut-off point of 44 was obtained, which may be considered reliable since a healthy population was used. The original study done in the USA[13] indicates a cut-off of 41, with a sensitivity of 80% and a specificity of 72%. The German study[16] also developed these analyses considering each subscale, which makes it impossible to compare with previous studies. As in the original study, we considered very important the determination of a cut-off point for our Portuguese population, since it is a useful tool in the clinical practice. Nevertheless, children with lower scores, and therefore not identified by the questionnaire, may have a sleep problem in a specific "non-behavioral" area. This situation is due to the fact that the CSHQ is oriented to identify behavioral sleep disorders; therefore the partial results obtained in each subscale should be individually analyzed, avoiding false negatives and thereby contributing to a more effective screening[13].

Differences between the community and clinical samples indicate that parents of the clinical sample identify more problems regarding sleep, when compared with parents of the community sample. Parents of the clinical sample believe that their children are more resistant (e.g., struggles at bedtime), and have more anxiety (e.g., afraid of sleeping alone) at bedtime, have more parasomnias and breathing disorders (e.g., obstructive sleep apnea), and also have a sleep duration that is less suitable, taking sometimes more time to sleep and waking more times during the night, which in turn results into difficulty awaking in the morning and staying alert during the day. These results confirm the presence of adequate validity levels stressing the usefulness of the CSHQ-PT in distinguishing between healthy children and children with sleep disturbances[13,17]. These results are consistent with those obtained in the German study[17], in which statistically significant differences were found between the generality of the subscales.

Test-retest reliability was conducted for the community sample, indicating a high consistency for the total scale and the subscales (parents answers are in agreement over time, both in terms of disturbance quality and severity)[13]. These results are similar to those obtained in previous studies, notably in the USA(13), The Netherlands[16], Portugal[3], and Germany[17].

In regards to the SSR-PT, the descriptive study showed that the average total score is superior in the clinical sample (Community sample: M = 34.93; SD = 5.71; Clinical sample: M = 39.87; SD = 7.91). This also occurs when considering the mean score from only 13 of the items (Community sample: M = 19.61; SD = 8.87; Clinical sample: M = 22.91; SD = 10.50). These results show that children in the clinical sample identified themselves has having a greater number of sleep problems, when compared to their peers of the community sample. A comparison of these results with the obtained in different cultural studies becomes complicated due to the use of a different number of items. For example, the Spanish study[18] used 16 items (M = 7.79; SD = 5.18). In the USA study[24] (Community sample: M = 20.55; SD = 5.06; Clinical sample: M = 18.62; SD = 3.28), and also in The Netherlands study[10] the mean score was calculated according to 13 items (M = 19.04 SD = 0.46). However, it is important to note that from these items, some were common to the Portuguese version, but others were quite different.

Regarding the internal consistency of the 23 items, high levels were found in both samples, with superior results in the clinical sample. It is noteworthy that these results are, however, inferior to those obtained in the USA[24] ($\alpha = 0.88$, with 23 items) and in the Spanish[18] studies ($\omega = 0.85$, with 16 items).

The test-retest reliability, conducted with the community sample, indicated a high consistency between assessment moments. In international terms, no previous study conducted this analysis.

The comparison between the results obtained in the community and clinical samples indicated the existence of statistically significant differences. The clinical sample shows more sleep-related problems. This result states that SSR is a good instrument to distinguish between healthy and sleep disturbed children.

Finally, statistically significant correlations between the considered items of the CSHQ-PT and SSR-PT were identified. These correlations were positive but low to moderate in 13 of the items, for the community sample, and in 9 of the items, for the clinical sample, indicating that the parental and children perceptions about sleep problems are congruent in most cases. It should be noted that in the USA study[13], no correlations were found in the healthy group, but correlations exceeding 0.30 in the clinical sample were reported. In The Netherlands' study[10], correlations were small to moderate in 6 of the 11 items. Parental questionnaires show adequate correlation with objective sleep measures, but in assessing sleep quality, parents are less accurate[10]. In the literature[14] children tended to identify more sleep problems, particularly sleep onset delay and night awakenings than did their parents.

In conclusion, the added value of our work was the demonstration that both questionnaires (CSHQ-PT and SSR-PT) have validity, consistency, and differentiate clinical from non-clinical populations. In future research it would be important to deepen the study of their psychometric qualities, including the development of exploratory and confirmatory factor analysis. It would also be important to expand the number of participants, particularly as regards the clinical samples of parents and children. In spite of the clinical usefulness of the used tools we would recommend in a second step the use of specific scales for sleep disturbances, namely the Children Sleep Disturbance Scale as implemented and validated by Bruni et al.[25], and culturally adapted and validated more recently to Portuguese language by Ferreira et al.[26] in Brazil.

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