

# Cross-cultural adaptation and psychometric validation of the Children with Special Health Care Needs Screener<sup>®</sup> for European Portuguese in a school setting

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## Abstract

**Introduction and Objectives:** Children with special health care needs (CSHCN) constitute a growing and heterogeneous group. The Children with Special Health Care Needs Screener<sup>®</sup> (CSHCN Screener<sup>®</sup>) is a brief (five-item), reliable, and clinically useful instrument for identifying these children. The objective of this study was to culturally adapt and evaluate the psychometric properties of the CSHCN Screener<sup>®</sup> for Portuguese children in a school setting, based on the translation and adaptation of the instrument validated for Brazilian Portuguese. **Method:** The study comprised two phases: (a) cross-cultural adaptation with experts and a pre-test, including face validity, with 54 parents/guardians (PG); and (b) reliability assessment in a sample of 301 PG through internal consistency (Cronbach's alpha), test-retest (kappa coefficient), and content validity with experts, using the content validity index (CVI). **Results:** The final instrument is culturally appropriate. The items demonstrated adequate reliability ( $\alpha = 0.75$  and  $0.77$ ). The overall test-retest concordance coefficient (Test 1 – Retest 1 to Test 5 – Retest 5) demonstrated considerable temporal stability ( $\text{kappa} > 0.8$ ). Face validity indicated that the CSHCN Screener<sup>®</sup> is easily understood by PG. Experts agreed on the relevance, comprehensibility, and comprehensiveness of the content (CVI = 1.00). **Discussion:** The CSHCN Screener<sup>®</sup>, culturally adapted to European Portuguese, is reliable and useful for identifying CSHCN who present one or more of the five consequences included in the questionnaire, and will contribute to developing policies that promote health, with an emphasis on transdisciplinary intervention, specifically in the school context. It shows high potential for adaptation and applicability in different care contexts.

**Keywords:** Child health. School health services. Reproducibility of results.

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Received: 22-07-2025

Accepted: 06-11-2025

<https://pjp.spp.pt>

Available online: 08-01-2026

Port J Pediatr. 2026;57(2):92-102

DOI: 10.24875/PJP.25000058

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## **Adaptação transcultural e validação psicométrica do Children with Special Health Care Needs Screener® para o português europeu em contexto escolar**

### **Resumo**

**Introdução e Objetivo:** As crianças com necessidades de saúde especiais (NSE) constituem um grupo crescente e heterogêneo. O Children with Special Health Care Needs Screener® (CSHCN Screener®) é um instrumento breve (cinco itens), fiável e com utilidade clínica para identificar estas crianças. O objetivo foi adaptar culturalmente e avaliar psicometricamente o CSHCN Screener® para crianças portuguesas, em contexto escolar, com base na tradução e adaptação do instrumento validado para português do Brasil. **Método:** O estudo compreendeu duas fases: (a) adaptação transcultural com especialistas e um pré-teste, incluindo a validade de face com 54 pais/encarregados de educação (PEE); (b) avaliação da fiabilidade com 301 PEE através da consistência interna (alfa de Cronbach), do teste-reteste (índice kappa) e validade de conteúdo com especialistas, utilizando o índice de validade de conteúdo (IVC). **Resultados:** O instrumento final é culturalmente apropriado. Os itens demonstraram adequada fiabilidade ( $\alpha = 0.75$  e  $0.77$ ). O coeficiente geral de concordância teste-reteste (Teste 1 – Reteste 1 a Teste 5 – Reteste 5) demonstrou bastante estabilidade temporal ( $\text{kappa} > 0,8$ ). A validade facial indicou que o CSHCN Screener® é facilmente compreendido pelos PEE. Os especialistas concordaram quanto à relevância, compreensibilidade e abrangência do conteúdo (IVC = 1.00). **Discussão:** O CSHCN Screener®, culturalmente adaptado para o português europeu, é fiável e útil para identificar as crianças com NSE que apresentam um ou mais das cinco consequências do questionário, e contribuirá para o desenvolvimento de políticas que promovam a saúde, com destaque para a intervenção transdisciplinar, especificamente em contexto escolar. Evidencia um elevado potencial de adaptação e aplicabilidade em diferentes contextos de cuidados.

**Palavras-chave:** Saúde da criança. Serviços de saúde escolar. Reprodutividade dos testes.

### **Keypoints**

#### **What is known**

- The CSHCN Screener® is considered the “gold standard” for identifying special health needs. The European Portuguese version lacks psychometric validation.

#### **What is added**

- This study provides the first psychometric validation of the European Portuguese version of the CSHCN Screener®, building on the Brazilian adaptation and applying it to a school-based, regionally distinct context.
- The findings confirm the instrument’s reliability, validity, and practical usefulness, reinforcing its applicability across different educational and healthcare settings in Portugal.

### **Introduction**

Children with Special Health Care Needs (CSHCN) represent a heterogeneous and growing population.<sup>1</sup> Since 1998, in international literature, CSHCN have been broadly defined as children who have, or are at increased risk for, a chronic physical, developmental, behavioral, or emotional condition and who require health-related services beyond those used by children generally.<sup>2</sup> Up until then, and for many years, this concept remained limited to children with formal clinical diagnoses or defined disabilities, failing to encompass the broader consequences of chronic health conditions or to include children whose needs fall outside traditional diagnostic categories.<sup>3</sup>

The original Children with Special Health Care Needs Screener® (CSHCN Screener®) was developed in the United States (US) between 1998 and 2000 as part of a national collaborative program, led by the Child and Adolescent Health Measurement Initiative

(CAHMI) and supported by the David and Lucile Packard Foundation and the Agency for Healthcare Research and Quality, using this more comprehensive federal definition of CSHCN from the Maternal and Child Health Bureau (MCHB).<sup>4,5</sup> The MCHB later endorsed the CSHCN Screener as a standardized way to operationalize the definition of CSHCN, and it has since been incorporated into several national and state surveys.<sup>6,7</sup> Specifically, the 2023 National Survey of Children’s Health (NSCH) was the eighth annual production following the redesign and merging of the previous NSCH and National Survey of CSHCN.<sup>8</sup> This survey assesses the prevalence and impact of special health care needs among children in the US, as well as changes over time.<sup>9</sup>

The CSHCN Screener® is a five-item tool based on a parent survey that addresses the need for an efficient and flexible standardized method to identify these children.<sup>5</sup> The first consequence, medication use, is

represented by an item that assesses the need for prescribed medication for a current chronic condition, excluding vitamins (a period of one year or more is considered as classifying a chronic condition). The second domain, use of health services, is represented by three items: the need for more medical care, mental health services, or educational services than most children of the same age; the need for special therapy, such as physical, occupational, or speech therapy; and whether the child has any type of emotional, developmental, or behavioral problem for which he or she needs or receives treatment or counselling. The last domain, functional limitation, is represented by an item that assesses the presence of any limitation or disability in performing activities common to most children.<sup>5,10</sup> The domains in this definition are not mutually exclusive, meaning that a child may qualify in one or more domains.<sup>5</sup>

Studies indicate that allergies, asthma, attention deficit, and emotional issues are among the most common conditions affecting CSHCN. Most of these children live with two or more chronic conditions. In 2019-2020, nearly one in five children (19.4%) in the US had a special health care need, representing 14.1 million children.<sup>6,10</sup>

However, despite being widely used since its inception, until 2011 there were no published studies analyzing the internal psychometric properties of the CSHCN Screener®. It was in that year that its internal psychometric validation was formally established, using classical and modern test theory methods, confirming the instrument's reliability and accuracy in identifying these children.<sup>6</sup> This evidence reinforced the method, consolidating it as the "gold standard" for defining these needs and supporting prevalence estimates in national and state contexts.<sup>11</sup>

But despite the growing international interest in this population, an analysis of Portuguese scientific production on this group, particularly within the school context, reveals a notable lack of studies focused on screening and caring for children with chronic conditions or special health care needs.<sup>12</sup>

The CSHCN Screener® was recently translated and semantically and culturally adapted from the originally published US version into Portuguese. Psychometric properties such as internal consistency and temporal stability were not evaluated.<sup>13</sup> This study therefore complements the validation carried out previously by establishing the psychometric properties of the CSHCN Screener® for European Portuguese, similar to what was done with the original instrument in 2011<sup>6</sup> and

applying it to a sample from a different geodemographic area than that of the previous study.

The development of this methodological study arises from the lack of reliable and accessible records, as well as the absence of official estimates regarding the number of Portuguese CSHCN, which significantly hinders healthcare planning, particularly in the school setting, an environment where children spend most of their time each day.<sup>14,15</sup> The adaptation and psychometric validation of this instrument within the school context is unprecedented and represents an original contribution to the field, filling the gap in information gathering and enabling international comparisons.

This research is part of a broader, multicenter project, the next stage of which involves conducting a prevalence study of CSHCN in school settings.<sup>16</sup>

The main objective of this phase was to culturally adapt the instrument to European Portuguese, based on the previously translated and adapted version for Brazilian Portuguese (conducted in 2016),<sup>17,18</sup> based on the linguistic similarity between the variants. We also aimed to evaluate its psychometric properties in a sample of Portuguese parents/guardians (PG). The research question is: How do the cultural adaptation and psychometric evaluation of the CSHCN Screener ensure its suitability for Portuguese children?

The complete CSHCN Screener® instrument for European Portuguese resulting from this study is available upon request from the authors.

## Method

### Design

We conducted a methodological study in two phases: cross-cultural adaptation and psychometric assessment. These phases include several consecutive steps and are based on the Brazilian Portuguese translation and adaptation of the CSHCN Screener®.

#### *Phase 1: cross-cultural adaptation*

The first phase included the cross-cultural adaptation of the instrument-based Beaton methodology.<sup>19</sup> The cross-cultural adaptation into European Portuguese was based on the Brazilian Portuguese version, as they are variants of the same language.<sup>19</sup> We checked whether the instrument items were understood in the same way (lexical and idiomatic equivalence) and had the same meaning (conceptual and cultural equivalence),<sup>20</sup> that is, we analyzed the impact the terms have in the Portuguese cultural context.

In January 2022, the CSHCN Screener® was independently adapted from Brazilian Portuguese to European Portuguese by two professionals: 1) a Portuguese teacher who was not familiar with the instrument, who aimed to increase linguistic and cultural accuracy; 2) a Brazilian health researcher living in Portugal for more than ten years, also not familiar with the instrument, who compared the version adapted into Portuguese by the Portuguese teacher with the original Brazilian version. This process took place in February 2022. The suggestions and considerations regarding the adaptation were subsequently noted in a comparative table with four columns, constructed by the researchers for discussion and the construction of a consensus version by the panel of experts. In the first column, the validated translation and adaptation from Brazil was entered; in the next two columns, the versions with the adaptations and considerations of the language professionals were placed; and in a fourth column, the adapted parts of the items were highlighted using colors, thus facilitating a comparative analysis.

A preliminary consensus adaptation was agreed at an online expert committee meeting on May 10, 2022. The panel included a methodologist, a linguist, a health professional, and the research team, which included three Portuguese professors with a PhD in Nursing Sciences, the main investigator, and the author of the Brazilian translation and adaptation of the instrument, who has a PhD in Public Health Epidemiology.

Items and terms with 90% agreement between experts were accepted as equivalent.<sup>21</sup> The language used was the most semantically appropriate to the concepts of health in Portugal.

After the preliminary consensus version, we carried out a pre-test to assess face validity. The participants, PG, were asked about the clarity of the content and if they had any difficulties in answering the specific questions.

The standard for reviewing and modifying an item was that less than 80% of the PG understood the item or more than 20% of the participants suggested modifications.<sup>22</sup> As it turned out, the questionnaire did not require any changes as the suggestions the participants made were marginal.

On December 19, 2022, the final adaptation of the CSHCN Screener® tool for European Portuguese was agreed after a further consensus meeting with the panel of experts. Once again, items and terms with 90% agreement between the experts were accepted as equivalent.<sup>21</sup>

## **Phase 2: psychometric assessment**

In the second phase, a pilot study was conducted to assess the quality of the psychometric properties of the European Portuguese adaptation of the CSHCN Screener®.

To assess the methodological quality of the instruments, we selected measurement properties according to the criteria of the Consensus-based Standards for the Selection of Health Measurement Instruments (COSMIN) taxonomy in the most studied domains: reliability and validity.<sup>23</sup>

The internal consistency of the complete set of instrument questions was assessed using the same procedure to assess the psychometric characteristics of the original US instrument.<sup>6</sup> The Cronbach's alpha was first calculated for the five main questions, and a combination of the responses to the items of each consequence was then created in a testlet, which is a set of test items presented together but that can be answered independently.<sup>24</sup>

A child or young person received a score of 1 on the testlet if they met all the criteria for a consequence (e.g., if the child needs or takes prescribed medication as a result of a condition lasting at least 12 months); otherwise, they received a score of 0.<sup>6</sup>

Cronbach's alpha results were classified using weighted data as unacceptable (< 0.6), weak (0.6 and 0.7), fair (0.7 and 0.8), good (0.8 and 0.9), and excellent (0.9 and 1).<sup>25</sup>

The kappa coefficient was used to assess the test-retest reliability, which is recommended for variables that are relatively stable over time and in circumstances in which changes in study variables cannot be predicted.<sup>21</sup>

Considering the above, reliability coefficients above 0.70 are considered as satisfactory and 0.85-0.95 as preferable.<sup>21</sup> In general, research tool test-retest reliability coefficients above 0.9 are considered high and 0.7-0.8 are considered acceptable.<sup>26</sup>

As for the application of the questionnaire, this included general information with two sections: 1) demographic data about the PG and child/young person (only the PG were interviewed and provided information about the child); and 2) final CSHCN Screener® adaptation for European Portuguese.

In the pre-test phase, to check for face validity, the principal investigator and three duly trained nursing students, aware of the purpose of each question, administered the questionnaire by telephone to the PG. In the pilot study phase, the survey was conducted using an online questionnaire in Google Forms, which

was answered by the PG; the questionnaire was administered in schools by the school health teams.

The research team maintained close contact with the school health teams. The research team held a preparatory meeting to provide information and supporting documentation so that the teams' contact persons could implement the data collection process. The documentation included the questionnaire, which contained the Informed Consent Form. An invitation email was also sent so that the contact persons could select, contact, and invite the heads of the school groups to take part in the study. Then, the school health teams contacted the school teaching teams.

To simplify communication between the school and the PG, the teachers were responsible for sending the invitation email with the link to fill in the questionnaire.

For test-retest, the invitation email asked the PG to complete the questionnaire again two weeks later, using the same link. Several reminders were sent to ask participants to do so. As a result, 34 PG repeated the questionnaire.

Survey data were encrypted to ensure the participants' security and anonymity. Unanswered questions were not taken into consideration. "Yes" was scored as one point and "no" as zero points.

The second important validation criterion was validity, which briefly assesses the degree to which the instrument measures the construct it is supposed to measure.<sup>23</sup> Validity was complemented by content validity, which assessed whether the CSHCN Screener® for European Portuguese covers all aspects of CSHCN, and was evaluated by the qualitative judgments of a panel of experts<sup>27</sup> comprising three to five participants.<sup>28</sup>

The experts had to be nursing professionals with a master's degree in nursing and more than five years of experience, who worked in the field of school health and participated in intervention projects focused on CSHCN. To meet these requirements, three nurses from different Community Care Units (CCU) in the Regional Health Administration of Lisbon and the Tagus Valley (RHAlTV) were invited.

The assessment used the content validity index (CVI) between the experts as a validity indicator, classifying each item individually into the following categories: 1 = not relevant; 2 = not very relevant; 3 = relevant; and 4 = quite relevant.<sup>28</sup> More specifically, it analyzed whether the instrument measures what it is supposed to measure and covers all aspects related to the CSHCN, highlighting that the instrument should not include items not related to this construct.

Thus, the experts were asked to rate the relevance, comprehensibility, and comprehensiveness of each

item in the instrument using a four-point scale and to record these ratings in a table created for this purpose. This process culminated on July 12, 2023. Content validity included no statistical treatment, and the index was calculated for the general instrument.<sup>26,29</sup> The CVI is calculated by the number of items scoring 3 and 4 in relation to the total number of items or questions over the total number of statements or questions, with a result greater than 0.80 considered acceptable.<sup>29</sup>

### Data collection

In the first phase, for face validity, during the pre-test, we compiled a non-probabilistic convenience sample of 54 PG of children aged between three and 17 years, enrolled from preschool to secondary school, who were users of a CCU belonging to the central Portuguese Regional Health Administration (RHA). Subjects that were representative of the population analyzed were included but not chosen for the main study. The pre-test was conducted on August 6, 2022.

In the second phase, in the pilot study, the target population included PG in public school groups associated with the corresponding Health Centre Groups (HCG). A non-probabilistic convenience sample was adopted, statistically calculated at a 10:1 ratio, that is, each instrument question equals 10 research subjects.<sup>25</sup> In line with methodological guidance, several authors propose securing more than 100 participants as a very good criterion for assessing internal consistency, estimating measurement error and reliability, testing construct-validity hypotheses, and comparing subgroups;<sup>30</sup> others recommend sample sizes of between 100 and 200 respondents<sup>31</sup> or at least 200 participants.<sup>32</sup> A rule of thumb of 10 participants per instrument item is also frequently cited as appropriate.<sup>33</sup> Furthermore, convenience sampling is considered suitable for this type of study provided that participants exhibit characteristics aligned with the intended use of the instrument.<sup>32,34-35</sup>

Of the five school groups from the corresponding pilot HCG, six schools were included, with a sample of 301 participants. The online questionnaire was administered between January 2 and March 31, 2023.

### Data analysis

Data analysis was performed using IBM SPSS statistical software (version 29.0, IBM, New York, USA). Cronbach's alpha was used to assess reliability through internal consistency. The kappa coefficient was used to analyze the agreement of nominal dichotomous

**Table 1.** Discrepant items and sub-items identified during the semantic, idiomatic, conceptual, and cultural equivalence of the CSHCN Screener® for European Portuguese

| Original item/sub-item/term                                                                                                | Consensus version item/sub-item/term                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| 1a, 2a, 3a, 4a. Is this due to ANY medical, behavioral, or other health condition?                                         | 1a, 2a, 3a, 4a. Is this due to ANY disease, behavioral problem, or other health problem?                                  |
| 2. Does (child's name) need or use more medical, psychosocial, or educational services than most children of the same age? | 2. Does (child's name) need or use more medical, mental health, or education services than most children of the same age? |
| 1, 2, 3, 4, 5. (Child's name)                                                                                              | 1, 2, 3, 4, 5. (Your child)                                                                                               |

variables. To assess the instrument's temporal stability, the test–retest agreement coefficients (kappa) between the items in both applications (Test 1 – Retest 1 and Test 5 – Retest 5) were analyzed, allowing for consistency of responses over time.

### **Ethical considerations**

In both phases, the inclusion criterion was to be a PG for children aged between three and 17 years, enrolled from preschool to high school, who was familiar with the child's health and signed the Informed Consent Form after the study objectives were explained. This study was approved by the Research Ethics Committee of the Health Sciences Research Unit: Nursing (UICISA-E) of the Nursing School of Coimbra (ESENfC) (decision dated December 15, 2021; opinion No. 8811\_10\_2021), and by the Directorate General of Education – Monitoring of School Surveys on February 25, 2022 (Registration No. 0812200001). The Health Ethics Committee of RHALTV issued a favorable conditional opinion on August 17, 2022 (opinion No. 3255/CES/2022). The instrument was adapted with permission from the CAHMI, Baltimore, MD, US, which created the CSHCN Screener®.

## **Results**

The terms modified in the cross-cultural adaptation phase were “clinical, behavioral, or other health condition,” which was repeated four times in dichotomous instrument sub-items 1a, 2a, 3a, and 4a, and the term “psychosocial,” contained in item 2. The sub-items and the item showing discrepancies at this stage are presented in [table 1](#). For the four sub-items, we opted for an adaptation similar to the one described in the Brazilian Portuguese translation and adaptation of the instrument.<sup>18</sup> In the second item, the decision was made after comparing the term psychosocial in the preliminary version with the original term in the original US instrument and its suitability for health concepts in Portugal.

In the items marked 1, 2, 3, 4, and 5, the panel of experts decided to replace the term “(child's name)” with “your child,” as this choice reflects language that is more appropriate to the school context. The decision was made after comparing the wording of the original instrument with the proposed final adaptation, as presented in [table 1](#).

The results of the pre-test face validity assessment suggest that the CSHCN Screener® for European Portuguese instrument has strong face validity, since participants reported that it is easy to understand and complete. Therefore, the five domains and nine dichotomous items of the original instrument, which correspond to the classification criteria for identifying CSHCN, were maintained.

Respondents in the pilot study for the instrument psychometric assessment were predominantly adult highly educated mothers, as presented in [table 2](#).

Most children were girls in elementary school: 26.6%, 28.2%, and 20.9% in the first (six to 10 years of age), second (10-12 years), and third (12-15 years) cycles, respectively, as presented in [table 3](#).

The overall standardized internal consistency for the first questions was  $\alpha = 0.75$  ([Table 4](#)). The item “medication” had the lowest item-total correlation. However, excluding this item would not increase the alpha to the point of justifying its removal.

Testlets had an  $\alpha$  of 0.77. The item “medication” had the lowest item-total correlation. However, excluding this item would not increase the alpha to the point of justifying its removal. The Cronbach's alpha values after excluding each item are reported in [table 4](#).

The use of the main questions and testlets to calculate internal consistency revealed results comparable to those of the original English instrument, with  $\alpha = 0.72$  and 0.78, respectively.<sup>6</sup> The values were also similar to those of the translation and adaptation into Brazilian Portuguese, achieving an overall internal consistency of  $\alpha = 0.8$ .<sup>17</sup> Likewise, the psychometric characteristics show high test-retest agreement.

**Table 2.** Sociodemographic profile of PG who completed the CSHCN Screener® for European Portuguese, Portugal, 2023

| Variables             | n    | %    |                |
|-----------------------|------|------|----------------|
| Sex                   |      |      |                |
| Female                | 269  | 89.4 |                |
| Male                  | 32   | 10.6 |                |
| Relationship          |      |      |                |
| Mother                | 267  | 88.7 |                |
| Father                | 29   | 9.6  |                |
| Another family member | 5    | 1.7  |                |
| Age                   | Min. | Max. | M <sub>e</sub> |
| Years                 | 19   | 58   | 40.8           |
| Education             |      |      |                |
| University            | 134  | 44.5 |                |
| High school           | 118  | 39.2 |                |
| Elementary school     | 48   | 16   |                |
| No education          | 1    | 0.3  |                |

N: number of participants/observations; %: percentage; Min.: minimum; Max.: maximum; Me: median.

**Table 3.** Sociodemographic profile of children and young adults screened by the CSHCN Screener® for European Portuguese, Portugal, 2023

| Variables     | n    | %    |                |
|---------------|------|------|----------------|
| Sex           |      |      |                |
| Female        | 165  | 54.8 |                |
| Male          | 136  | 45.2 |                |
| Age           | Min. | Max. | M <sub>e</sub> |
| Years         | 3    | 17   | 10.8           |
| Education     |      |      |                |
| Preschool     | 29   | 9.6  |                |
| Middle school | 148  | 49.1 |                |
| High school   | 44   | 14.6 |                |

N: number of participants/observations; %: percentage; Min.: minimum; Max.: maximum; Me: median.

The level of agreement regarding the stability of instrument items was measured through the analysis of the test-retest reliability using the kappa coefficient of agreement. The analysis of the correlation matrix between the items and the total scale established that the instrument is quite stable (kappa agreement coefficient between 1.0 and 0.8), except for question 5 (kappa agreement coefficient = 0.38), which obtained a lower value, as shown in [table 5](#). The total cross-tabulation indicates a high kappa, reflecting good overall agreement and stability of the instrument (kappa > 0.80).

After the statistical tests, all the experts classified the items of the CSHCN Screener® instrument in European Portuguese with a relevance scale of 3 or 4. In this

**Table 4.** Cronbach's alpha and descriptive statistics for the main questions and testlets

| First question approach |      |      |                        |                            |
|-------------------------|------|------|------------------------|----------------------------|
| Item                    | Mean | SD   | $\alpha = 0.75$        |                            |
|                         |      |      | Correlation with total | $\alpha$ with item deleted |
| Medications             | 0.11 | 0.32 | 0.37                   | 0.76                       |
| Services                | 0.13 | 0.34 | 0.69                   | 0.63                       |
| Activity limitation     | 0.06 | 0.23 | 0.48                   | 0.72                       |
| Therapy                 | 0.12 | 0.33 | 0.48                   | 0.71                       |
| Counseling              | 0.13 | 0.33 | 0.58                   | 0.68                       |
| Testlet approach        |      |      |                        |                            |
| Item                    | Mean | SD   | $\alpha = 0.77$        |                            |
|                         |      |      | Correlation with total | $\alpha$ with item deleted |
| Medications             | 0.1  | 0.27 | 0.40                   | 0.78                       |
| Services                | 0.1  | 0.30 | 0.71                   | 0.66                       |
| Activity limitation     | 0.04 | 0.20 | 0.52                   | 0.74                       |
| Therapy                 | 0.07 | 0.25 | 0.54                   | 0.72                       |
| Counseling              | 0.09 | 0.29 | 0.56                   | 0.72                       |

$\alpha$ : Cronbach's alpha; SD: standard deviation.

**Table 5.** Test-retest agreement matrix. Kappa coefficient of agreement values for each item of the instrument between the two applications and total cross-tabulation (test and retest)

| Cross-tabulation per item (T × R) | Kappa coefficient of agreement |
|-----------------------------------|--------------------------------|
| T1 and R1 cross-tabulation        | 0.89                           |
| T2 and R2 cross-tabulation        | 0.87                           |
| T3 and R3 cross-tabulation        | 0.78                           |
| T4 and R4 cross-tabulation        | 1.000                          |
| T5 and R5 cross-tabulation        | 0.38                           |
| Total cross-tabulation            | 0.82                           |

T: test; R: retest.

content assessment, the CVI reached 100% consensus, which is considered a perfect consensus (CVI = 1.0).

## Discussion

This study highlights the relevance of cross-cultural adaptation and psychometric evaluation of the CSHCN Screener® into European Portuguese, especially considering that health promotion in schools is a strategic

priority.<sup>14</sup> In this context, governments and policymakers are showing increasing concern for equity and inclusion in education, with the aim of ensuring that all students can develop their potential and participate constructively in increasingly diverse and complex societies.<sup>36</sup>

These principles are particularly relevant for CSHCN, whose inclusion requires intersectoral and multidisciplinary approaches, as their higher rates of school absenteeism may negatively impact their academic performance.<sup>37</sup> In Portugal, intervention with CSHCN must be based on specific, integrated strategies. These include, among others, the National Child and Youth Health Program,<sup>38</sup> the Health Action for Children and Youth at Risk,<sup>39</sup> the National School Health Program,<sup>40</sup> and the National Early Childhood Intervention System.<sup>41</sup>

To support this intervention, healthcare professionals need valid, reliable screening tools that are adapted to the clinical context, such as the CSHCN Screener®, which enables the early identification of CSHCN. The standardized use of this type of tool makes it possible to characterize the profile of this population and guide priorities in terms of surveillance, research, program planning, and public policy formulation.<sup>3</sup> In addition, the data collected are relevant across the board, given that children often interact with different sectors, namely health, education, and social action.<sup>42</sup>

Conducted specifically in the school context, this study is highly relevant and could contribute significantly to identifying these children, characterizing their areas of need, and subsequently defining strategic guidelines that promote health.

From the implementation of this project and the results obtained, namely the cross-cultural adaptation, psychometric validation, and the prevalence study conducted across several regions of Portugal using this version of the CSHCN Screener®, significant progress was achieved in strengthening the coordination between the health and education sectors.

In fact, our team and the group responsible for the recent translation, cultural adaptation, and validation of the CSHCN Screener® into Portuguese, developed from the original US version and carried out in a different region of Portugal, joined efforts to develop a consensual version of the instrument. This new version builds upon the work independently conducted by both teams during the cross-cultural adaptation process and incorporates the psychometric validation performed in this study. This process underscores the collaborative, continuous, and evolving nature of the validation of the CSHCN Screener® in Portugal, thereby consolidating its applicability and relevance in both educational and health contexts.

The original instrument is incorporated into the NSCH, the main source of national estimates in the US.<sup>3,11</sup> It has also been translated, adapted, validated, and implemented in countries such as Brazil,<sup>18</sup> Egypt,<sup>43</sup> Canada,<sup>44</sup> Switzerland,<sup>45</sup> and Poland.<sup>46</sup> With its recent adaptation and validation for the Portuguese context, it is now possible to obtain standardized and comparable estimates of the health needs of this population in Portugal too, contributing to a better understanding and response by health professionals and decision-makers, thereby promoting practices aligned with clinical reality.<sup>6</sup> Furthermore, the content of the instrument aligns with the inclusive multidimensional measure of CSHCN according to Portuguese guidelines. The instrument assesses the consequences of health conditions duly focused on the technical-normative guidelines of the Portuguese School Health Program.<sup>40</sup> Additionally, it considers the legal framework that supports the recent paradigm of inclusive education, as established in Article No. 1, of Decree-Law No. 54/2018 of July 6,<sup>47</sup> as amended by Law No. 116/2019, of September 13,<sup>48</sup> and Decree-Law No. 62/2023, of July 25.<sup>49</sup> This legislation defines the legal framework for inclusive education within primary and secondary education across public, private, cooperative, and solidarity-based networks in Portugal, outlining the support measures for learning and inclusion, as well as the specific resources to be mobilized in order to address the educational needs of children and young people throughout their school journey.

Moreover, it is a simple, quick-to-administer, and self-administered instrument that can also be applied by health professionals.<sup>5</sup>

From a methodological standpoint, throughout the cross-cultural adaptation process, we followed international guidelines and used psychometric methods similar to those used in the original 2011 US validation of the CSHCN Screener®, based on the validated Brazilian version. This last part of the methodology is also interesting and somewhat unprecedented, as it is uncommon to find instruments validated in the same language but across different cultures.

### Limitations

This study had limitations. First, the population was obtained by a non-probabilistic convenience sampling technique, with data collection limited to children and young people from six schools in a single region of the country, which resulted in particularities of their socio-cultural and socioeconomic context. This means that this sample is not representative of all Portuguese

children and young people. Thus, future studies should include a representative number of participants, geographically distributed, and covering different cultural and socioeconomic realities.

Second, this study included only PG of children and young people in a school context; therefore, future research must include other healthcare settings. We suggest the inclusion of the context of functional healthcare units, specifically in Portuguese primary healthcare and hospital care, involving the parents and family members of children and young people.

Furthermore, the expert panel was restricted to three nurses, all from the same region of the country. Other studies should extend the validation to other professionals and to different regions of the country.

Finally, there were limitations regarding the self-administration of the instrument, which may have raised questions during completion.

## Conclusion

The European Portuguese CSHCN Screener® demonstrated adequate reliability and validity for screening CSHCN and could identify if the child has one or more of the five conditions related to special health care needs. Content validity and face validity were the initial steps in establishing the instrument's validity. Additionally, other psychometric properties, such as internal consistency and test-retest reliability, contributed to obtaining robust and comparable conclusions regarding the validity and reliability of the CSHCN Screener® for European Portuguese.

The screening and epidemiological results will be a key organizational planning component to develop a set of interventions for the inclusion of CSHCN, including the school context. Use of the instrument can potentially support the decision-making of other healthcare teams in various clinical practice settings and inform important public health policies.

## Author contributions

M.C. Coelho Monteiro Pires: conceptualization, data curation, formal analysis, investigation, methodology, resources, validation, visualization, writing (original draft), and writing (review and editing). M.C. Barbieri-Figueiredo: conceptualization, data curation, formal analysis, investigation, methodology, resources, supervision, validation, visualization, and writing (review and editing). A. Silva: data curation, formal analysis, investigation, methodology, software, validation, supervision, and writing (review and editing). A. Arrué: data curation, formal analysis, investigation, methodology, validation, visualization, and writing (review and editing). J. Guarda-Rodrigues: formal

analysis, investigation, methodology, validation, visualization, and writing (review and editing). E. Neves: formal analysis, investigation, validation, methodology visualization, and writing (review and editing). E. Menino: conceptualization, data curation, formal analysis, investigation, methodology, resources, supervision, validation, visualization, and writing (review and editing).

## Acknowledgments

The authors would like to thank the translators, nurses, and other health and education professionals from the pilot HCG who made a significant contribution to the development and data collection for this study.

## Previous presentations

This research has been previously presented on the following occasions: 16<sup>th</sup> International Conference on Nursing Research, Lisbon, Portugal, 2022. 1<sup>st</sup> National Meeting of the Portuguese Association of Primary Care Nurses, Lisbon, Portugal, 2023. 27<sup>th</sup> International Meeting on Nursing Research | 10<sup>th</sup> Ibero-American Research Congress, Valladolid, Spain, 2023.

## Funding

The authors received no financial support for the research and authorship of this article.

## Conflicts of interest

None.

## Ethical considerations

**Protection of human subjects and animals.** The authors declare that no experiments on humans or animals were performed for this research.

**Confidentiality, informed consent, and ethical approval.** The authors have followed their institution's confidentiality protocols, obtained informed consent from all patients, and secured approval from the Ethics Committee. SAGER guidelines have been followed as applicable to the nature of the study.

**Declaration on the use of artificial intelligence.** The authors declare that no generative artificial intelligence was used in the writing or creation of the content of this manuscript.

## References

1. Chukuigwe OA, Ilori EO, Agazie O, Umar UO, Okobi OE, Fatuki TA, et al. Children with special health care needs: an analysis of national survey of children's health database. *Cureus*. 2024 Apr 25;16(4):e59005.
2. McPherson M, Arango P, Fox H, Lauver C, McManus M, Newacheck PW, et al. A new definition of children with special health care needs. *Pediatrics*. 1998 Jul;102(1 Pt 1):137–140.

3. Ghandour RM, Hirai AH, Kenney MK. Children and youth with special health care needs: a profile. *Pediatrics*. 2022 Jun 2;149(Suppl 7):S731–S747.
4. Bethell CD, Blumberg SJ, Stein REK, Strickland B, Robertson J, Newacheck PW. Taking stock of the CSHCN screener: a review of common questions and current reflections. *Acad Pediatr*. 2015 Mar;15(2):165–176.
5. Child and Adolescent Health Measurement Initiative. Approaches to identifying children and adults with special health care needs: a resource manual for state Medicaid agencies and managed care organizations. Baltimore (MD): CAHMI; 2002. Available at: <http://www.cahmi.org/wp-content/uploads/2014/06/CSHCN-CMS-manual.pdf>
6. Carle AC, Blumberg SJ, Poblens C. Internal psychometric properties of the Children with Special Health Care Needs screener. *Acad Pediatr*. 2011 Mar;11(2):128–135.
7. Child and Adolescent Health Measurement Initiative (CAHMI); Foundation for Accountability (FACCT). Children with special health care needs (CSHCN) Screener® [Internet]. [place unknown]: CAHMI; [date unknown]. Available at: [https://cahmi.org/docs/default-source/default-document-library/cshcnscreeener-print-version.pdf?sfvrsn=9e98a4b3\\_0](https://cahmi.org/docs/default-source/default-document-library/cshcnscreeener-print-version.pdf?sfvrsn=9e98a4b3_0)
8. U.S. Census Bureau. 2023 National Survey of Children's Health: methodology report [Internet]. Washington (DC): U.S. Census Bureau; 2025. Available at: <https://www2.census.gov/programs-surveys/nsch/technical-documentation/methodology/2023-NSCH-Methodology-Report.pdf>
9. Centers for Disease Control and Prevention (CDC). National Survey of Children with Special Health Care Needs [Internet]. 2022 [cited 2025 Jul 12]. Available at: <https://www.cdc.gov/nchs/slits/cshcn.htm>
10. Health Resources and Services Administration (HRSA), Maternal and Child Health Bureau (MCHB). Children and youth with special health care needs [Internet]. 2022 [cited 2025 Jul 15]. Available at: <https://mchb.hrsa.gov/sites/default/files/mchb/programs-impact/nsch-data-brief-children-youth-special-health-care-needs.pdf>
11. Black LI, Ghandour RM, Brosco JP, Payne SI, Houtrow A, Kogan MD, et al. An expanded approach to the ascertainment of children and youth with special health care needs. *Pediatrics*. 2024;153(6):1-10.
12. Neves ET, Menino EPSG, Arruê AM, Pires MCCM, Figueiredo MCAB, Jantsch LB. Rastreamento e suporte de crianças e adolescentes com condições crônicas no contexto escolar em Portugal e Brasil. In: Quipá Editores, editor. *Doença crônica em crianças e adolescentes: produção de saberes e desafios para a saúde coletiva* [Internet]. 1st ed. Iguatu (BR): Quipá Editores; 2022. p. 98-123. Available at: <https://educapes.capes.gov.br/bitstream/capes/704358/2/ebook%20Doenca%20Cronica%20em%20Crianças%20e%20Adolescentes.%20Producao%20de%20Saberes%20e%20Desafios%20para%20a%20Saude%20Coletiva.pdf>. Portuguese.
13. Pombal F, Sousa L, Almeida S, Pereira A, Ferreira MA, Vieira E, et al. Tradução, adaptação cultural e validação da versão portuguesa do Children with special health care needs screener. *Rev Enferm Ref*. 2024;6(3):1-9.
14. World Health Organization. Guideline on school health services [Internet]. Geneva: World Health Organization; 2021 [cited 2025 Jul 31]. Available at: <https://www.who.int/publications/i/item/9789240029392>
15. National Association of School Nurses (NASN). School nursing: scope and standards of practice. 4th ed. Silver Spring (MD): NASN; 2022.
16. Menino E, Barbieri-Figueiredo, MC, Pires, M, Silva, A, Neves, M, Rodrigues, F, et al. Validação para Portugal do “Children with special health care needs screener®” e estudo de prevalência de crianças e adolescentes com necessidades de saúde especiais em contexto escolar [Internet]. Coimbra: Unidade de investigação em ciências da saúde: enfermagem (UICISA:E); 2022 [cited 2025 Jul 31]. Available at: [https://web.esenfc.pt/public/index.php?module=ui&target=outreach-projects&tipo=UI&id\\_projeto=866&id\\_linha\\_investigacao=1&dado\\_pedido=Descricao](https://web.esenfc.pt/public/index.php?module=ui&target=outreach-projects&tipo=UI&id_projeto=866&id_linha_investigacao=1&dado_pedido=Descricao)
17. Arruê AM, Neves ET, Magnago TSB de S, Cabral IE, Gama SGN da, Hökerberg YHM. Translation and adaptation of the Children with special health care needs screener to Brazilian Portuguese. *Cad Saude Publica*. 2016 Jun 20;32(6):e00130215.
18. Arruê AM, Hökerberg YHM, Jantsch LB, Gama SGN da, Oliveira RVC de, Okido ACC, et al. Prevalence of children with special healthcare needs: an epidemiological survey in Brazil. *J Pediatr Nurs*. 2022 Nov;67:95-101.
19. Beaton D, Bombardier C, Guillemin F, Ferraz MB. Recommendations for the cross-cultural adaptation of the DASH & QuickDASH outcome measures [Internet]. Toronto (CA): Institute for Work & Health; 2007 [cited 2023 Sep 10]. Report No.: 1(1):1-45. Available at: [https://dash.iwh.on.ca/sites/dash/files/downloads/cross\\_cultural\\_adaptation\\_2007.pdf](https://dash.iwh.on.ca/sites/dash/files/downloads/cross_cultural_adaptation_2007.pdf)
20. Marócio JP, Campos JADB, Vinagre MDG, Pais-Ribeiro JL. Adaptação transcultural Brasil-Portugal da escala de satisfação com o suporte social para estudantes do ensino superior. *Psicol Reflex Crit*. 2014;27:247-256. doi:10.1590/1678-7153.201427205. Portuguese.
21. Beck CT, Polit D. Fundamentos de pesquisa em enfermagem: avaliação de evidências para a prática da enfermagem. 9th ed. Porto Alegre: Editora Artmed; 2018. Portuguese.
22. Ruperto N, Ravelli A, Pistorio A, Malattia C, Cavuto S, Gado-West L, et al. Cross-cultural adaptation and psychometric evaluation of the Childhood Health Assessment Questionnaire (CHAQ) and the Child Health Questionnaire (CHQ) in 32 countries: review of the general methodology. *Clin Exp Rheumatol*. 2001 Jul;19(4 Suppl 23):S1-S9. Available at: [https://www.printo.it/docs/JAMAR\\_DOCS/AA\\_Working%20models/2\\_2001\\_CER\\_Ruperto\\_CHAQ-CHQ\\_validation.pdf](https://www.printo.it/docs/JAMAR_DOCS/AA_Working%20models/2_2001_CER_Ruperto_CHAQ-CHQ_validation.pdf)
23. Mookink LB, Prinsen CAC, Bouter LM, de Vet HCW, Terwee CB. The COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) and how to select an outcome measurement instrument. *Braz J Phys Ther*. 2016 Mar;20(2):43-51.
24. McDonald RP. Test theory: a unified treatment. Mahwah (NJ): Erlbaum; 1999.
25. Hill MM, Hill A. Investigação por questionário. 2nd ed. Lisboa: Síbalo; 2008. Portuguese.
26. Keszei AP, Novak M, Streiner DL. Introduction to health measurement scales. *J Psychosom Res*. 2010 Apr;68(4):319-323.
27. Kimberlin CL, Winterstein AG. Validity and reliability of measurement instruments used in research. *Am J Health Syst Pharm*. 2008 Dec;65(23):2276-2284.
28. Sousa LM, Carvalho ML, Veludo F, José HMG, Marques-Vieira C. Fidelidade e validade na construção e adequação de instrumentos de medida. *Enfermagem*. 2015;25-32. Available at: <https://repositorio-cientifico.uatlantica.pt/handle/10884/1016>. Portuguese.
29. Yuseff MSB. ABC of content validation and content validity index calculation. *Educ Med J*. 2019;11(2):49-54. doi:10.21315/eimj2019.11.2.6
30. Mookink LB, Prinsen CAC, Patrick DL, Alonso J, Bouter LM, de Vet HCW et al. COSMIN Study Design Checklist for Patient-Reported Outcome Measurement Instruments [Internet]. Amsterdam: COSMIN; 2019 [cited 2025 Oct 28]. Available from: [https://www.cosmin.nl/wp-content/uploads/COSMIN-study-designing-checklist\\_final.pdf](https://www.cosmin.nl/wp-content/uploads/COSMIN-study-designing-checklist_final.pdf).
31. Tafforeau J, Cobo ML, Tolonen H, Schnell-Nielsen C, Tinto A. Guidelines for the Development and Criteria for the Adoption of Health Survey Instruments [Internet]. Brussels: European Commission; 2015 [cited 2025 Oct 28]. Available from: [https://ec.europa.eu/health/ph\\_information/dissemination/reporting/healthsurveys\\_en.pdf](https://ec.europa.eu/health/ph_information/dissemination/reporting/healthsurveys_en.pdf)
32. International Test Commission. ITC Guidelines for Translating and Adapting Tests [Internet]. Amsterdam: International Test Commission; 2017 [cited 2025 Oct 28]. Available from: [https://www.intestcom.org/files/guideline\\_test\\_adaptation\\_2ed.pdf](https://www.intestcom.org/files/guideline_test_adaptation_2ed.pdf)
33. Sousa VD, Rojjanasirak W. Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *J Eval Clin Pract*. 2011;17(2):268-274.
34. Baker DL, Melnikow J, Ly MY, Shoultz J, Niederhauser V, Diaz-Escamilla R. Translation of health surveys using mixed methods. *J Nurs Scholarsh*. 2010;42(4):430-438.
35. Hernández A, Hidalgo MD, Hambleton RK, Gómez-Benito J. International Test Commission guidelines for test adaptation: a criterion checklist. *Psicothema*. 2020;32(3):390-398.
36. Organisation for Economic Co-operation and Development (OECD). Equity and inclusion in education: finding strength through diversity. Paris: OECD Publishing; 2023.
37. Centers for Disease Control and Prevention (CDC). School nurses help keep students healthy [Internet]. 2023 [cited 2025 May 25]. Available at: [https://www.cdc.gov/healthyschools/features/school\\_nurse.htm](https://www.cdc.gov/healthyschools/features/school_nurse.htm)
38. Direção-Geral da Saúde (DGS). Norma n.º 010/2013 de 31/05/2013 - Programa Nacional de Saúde Infantil e Juvenil [Internet]. Lisboa: DGS; 2013 [cited 2025 Apr 10]. Available at: <https://www.dgs.pt/directrizes-da-dgs/normas-e-circulares-normativas/norma-n-0102013-de-31052013-jpg.aspx>. Portuguese.
39. Direção-Geral da Saúde (DGS). Ação de saúde para crianças e jovens em risco: documento técnico [Internet]. Lisboa: DGS; 2008 [cited 2025 May 10]. Available at: <https://www.dgs.pt/accao-de-saude-para-criancas-e-jovens-em-risco.aspx>. Portuguese.
40. Direção-Geral da Saúde (DGS). Programa Nacional de Saúde Escolar [Internet]. Lisboa: DGS; 2015 [cited 2025 Jan 06]. Available at: <https://www.dgs.pt/pns-e-programas/programas-de-saude/saude-escolar.aspx>. Portuguese.
41. Portugal. Decreto-Lei n.º 281/2009, de 6 de outubro [Internet]. Lisboa: Diário da República; 2009 [cited 2025 Jul 10]. Available at: <https://diariodarepublica.pt/dr/detalhe/decreto-lei/281-2009-491397>. Portuguese.
42. Schiff J, Manning L, VanLandeghem K, Langer CS, Schutze M, Comeau M. Financing care for CYSHCN in the next decade: reducing burden, advancing equity, and transforming systems. *Pediatrics*. 2022 Jun 2;149(Suppl 7):S782-S790. doi:10.1542/peds.2021-0561501
43. Wahdan IH, El-Nimr NA. Identifying children with special health care needs in Alexandria, Egypt. *Pediatr Res*. 2018 Jul;84(1):57-61.
44. Arim RG, Kohen DE, Brehaut JC, Guévremont A, Garner RE, Miller AR, et al. Developing a non-categorical measure of child health using

- administrative data. Health Rep. 2015 Feb;26(2):9-16. Available at: <https://www150.statcan.gc.ca/n1/pub/82-003-x/2015002/article/14140-eng.pdf>
45. Mohler-Kuo M, Dey M. A comparison of health-related quality of life between children with versus without special health care needs, and children requiring versus not requiring psychiatric services. Qual Life Res. 2012;21(9):1577-1586.
46. Mazur J. Adaptation of CSHCN instrument for the use in assessing the prevalence of chronic diseases in children and adolescents in Poland. Przegl Epidemiol. 2009;63(1):137-142. Available at: <https://www.przegl Epidemiol. pzh.gov.pl/pdf-179737-100319?filename=Adaptation+of+CSHCN.pdf>
47. Portugal. Decreto-Lei n.º 54/2018, de 6 de julho [Internet]. Lisboa: Diário da República; 2018 [cited 2025 Mar 12]. Available at: <https://files.dre.pt/1s/2019/09/17600/0001200035.pdf>. Portuguese.
48. Portugal. Lei n.º 116/2019, de 13 de setembro [Internet]. Lisboa: Diário da República; 2019 [cited 2025 Mar 12]. Available at: <https://diariodarepublica.pt/dr/detalhe/lei/116-2019-124680588>. Portuguese.
49. Portugal. Decreto-Lei n.º 62/2023, de 25 de julho. Lisboa: Diário da República; 2023. <https://diariodarepublica.pt/dr/detalhe/decreto-lei/62-2023-216154388>. Portuguese.