

Cross-Cultural Adaptation and Translation of Short Sensory Profile 2: A Global Perspective

Joseph Sunny¹, Amitabh Kishor Dwivedi²

¹Department of Occupational Therapy, Maharaj Vinayak Global University, Jaipur, Rajasthan, India
Email: drjosephsunny[at]gmail.com

²Department of Occupational Therapy, JSS Medical College, JSS Academy of Higher Education and Research, Mysuru, Karnataka, India
Email: akdwivedi123[at]yahoo.com

Abstract: ***Background:** Sensory processing disorder is a heterogeneous condition in which individuals have impaired responses to, processing of, and/or organization of sensory information that affects participation in functional daily life routines and activities. Short Sensory Profile 2 is a standardized assessment tool to evaluate the sensory processing patterns of children from their birth to the age of 14.11 years in various contexts. **Objective:** The aim of the study is to compile relevant research on translation and cultural adaptation of Short Sensory Profile 2 in different languages. **Study design:** A review of literature. **Methods:** A systematic process was used to search the literature for this review. First, the sources of data were identified. The databases searched in this study included PubMed and Google Scholar. Then, the quality of the studies was assessed. The search keyword used were “short sensory profile 2” OR “sensory profile 2” AND “various languages” OR “different languages” which appeared in the title, abstract, and keywords. The publication descriptor data of these studies were analysed statistically. The inclusion criteria included the following: original research paper published in journal, and in the English language. Recurring themes were identified from the collected studies. **Results:** The total numbers of articles from the searches of the databases were 953. The Duplicate reference was removed. Further studies were excluded after reading the titles, abstracts, and complete articles of the study. The final number of articles included in the analysis was two. **Conclusion:** It was found that the professionals and the target population such as non-English speaking caregivers of the children found translated version of Short Sensory Profile 2 useful as a screening tool.*

Keywords: Sensory processing, Short Sensory Profile 2, Occupational Therapy, Translation, Cultural adaptation

1. Introduction

Sensory processing refers to the interface between the neurological function and the environment of the individual. Multiple models are available to describe the sensory processing patterns. Dunn’s sensory processing framework focuses on a better understanding of sensory processing in terms of various contexts such as home, school, and community. [1]

Dunn’s Sensory Processing Framework divides sensory processing along two continua and describes four unique subtypes of sensory processing. The first continuum—“neurological threshold”—describes an individual’s ability to detect sensory information, and the second continuum—“self-regulation”—refers to the way an individual responds to that stimuli. The interactions of these continua result in four patterns of sensory processing labelled as:

- Seeking: The degree to which a child obtains sensory input (high threshold and an active self-regulation strategy).
- Avoiding: The degree to which a child is bothered by the sensory input (low threshold and an active self-regulation strategy).
- Sensitivity: The degree to which a child detects sensory input (low threshold and a passive self-regulation strategy).
- Registration: The degree to which a child misses sensory input (high threshold and a passive self-regulation strategy). [2]
- Sensory processing disorder is a heterogeneous condition in which individuals have impaired responses to,

processing of, and/or organization of sensory information that affects participation in functional daily life routines and activities. [3]

The prevalence of sensory processing issues is reported to be around 1 in 20 to 1 in 6.25 children in the US general population and a more recent study in Finland found the prevalence of sensory abnormalities to be around 8.3% in an epidemiological population of 8-year-old children. Children with either SPD can have difficulties with processing the sensation from tactile, auditory, visual, gustatory, olfactory, proprioceptive, and/or vestibular systems. These deficits can affect a child’s adaptive behavior, learning, coordinated movements, active playfulness, reading, and arithmetic abilities. [4]

The Sensory Profile was developed by Winnie Dunn and published in 1999. It was developed to understand a child’s sensory processing patterns in everyday situations and profile the sensory system’s effect on functional performance for diagnostic and intervention planning among children from the ages of 3 to 10 years. The Short Sensory Profile had 38 items in the questionnaire. The updated version of Sensory Profile, Sensory Profile 2 was developed by Winnie Dunn and it was published in 2014. It is a standardized assessment tool to evaluate the sensory processing patterns of children from their birth to the age of 14.11 years in the context of home, school, and community based activities. Short Sensory Profile 2 is a short version of Child Sensory Profile -2. It is a 34-item caregiver questionnaire for children ages 3-14:11 years. It provides quick information for the screening and research purposes. [2]

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Most of the instruments used in Occupational Therapy practice are developed in English speaking countries. Hence, it is important to translate the instruments into different languages so that the professionals and caregivers find it easy to understand the items in it and provide appropriate scoring to the responses. Research shows that Short Sensory Profile was standardized in languages such as Spanish [6], [7], Malay [8], Italian [9], and Indian language such as Tamil[10]. Other caregiver versions were standardized in languages such as Malay [11], Hebrew [12], Arabic [13], [14], Turkish [15], Korean [16], Brazilian Portuguese [17], Greek [18], and Tamil [19].

The aim of this literature review is to compile relevant research on translation and standardization of Short Sensory Profile 2nd edition in different languages globally. This study also aims to explore how the translation and cultural adaptation process was conducted by the researcher and to propose future recommendations.

2. Methods

A systematic process was used to conduct the review. The articles were selected in the review on the basis of the inclusion criteria. Three steps were involved in conducting the review and they were identifying the data sources, establishing the criteria for assessing the quality of the studies and presenting the data and analysing the findings.

2.1 Identifying the data sources

The databases searched in this study included search engines such as PubMed and Google Scholar.

2.2 Criteria for assessing the quality of the studies

Hand searching and electronic subject searching were used to assess the quality of the studies. The search keyword strings used were “short sensory profile 2” OR “sensory profile 2” AND “various languages” OR “different languages” which appeared in the title, abstract, and keywords. The total number of identified articles from the searches of these databases was 953. One duplicate study was removed. Then, the count of articles was reduced to 952 articles. Studies were then included on the basis of titles and abstract, and 950 articles were removed as the title and abstract of the articles were not relevant to the research question of the present study. The inclusion criteria included the following: original research paper published in journal between 2014 and 2022, and must be published in English language [Table 1]

Table 1: Selection criteria for this study

Inclusion criteria	Exclusion criteria
Studies conducted using Short Sensory Profile 2nd edition and related to translation and standardization in various languages.	Studies conducted using other Sensory Profile questionnaires.
Study conducted in the period between 2014 and 2022.	Unpublished studies/thesis.
Studies published in the journals.	
Studies published in the English language.	
Studies in which full text was available.	

The final number of the articles in the analyses was two as shown in Preferred Reporting Items for Systematic Reviews and Meta-Analyses-flow-chart [Figure 1].

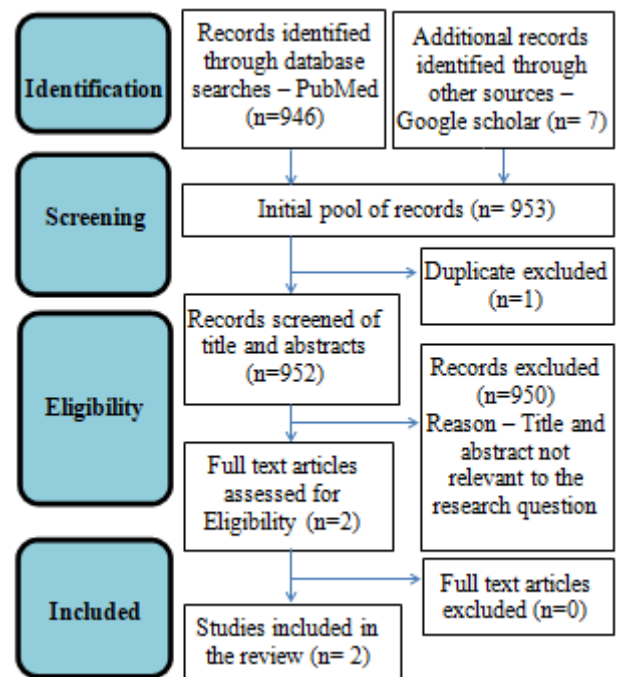


Figure 1: PRISMA Flow-chart. Preferred Reporting Items for Systematic Reviews and Meta-Analyses-flow-chart

2.3 Data presentation and analysis findings:

The publication descriptor data of these studies were analysed statistically. The dates of studies were taken between January 2014 and December 2022. The number of studies and the research themes were identified to establish the themes. Deductive approach was used on the basis of reviews to identify and develop categories and themes. The data collected from the reviews were described and interpreted.

3. Results

Table 2: Data Tabulation of selected two articles

First author and year	Study population	Aim of the study	Method	Main findings
MarjanShahbazi <i>et al.</i> (2021)	1272 children between 0 and 14 years without any	To translate and cross culturally adapt the original Sensory Profile 2 questionnaire to	The translation and linguistic adaptation of the Sensory Profile 2 was conducted via the American Educational Research	The Persian version of the Sensory Profile 2 could conceptually and semantically be equivalent to the original version. It is considered as an adequate assessment to

	disabilities	Persian and access the psychometric properties of the adapted version.	Association (AERA) and the International Test Commission (ITC). Psychometric testing was conducted.	measure sensory processing in the Persian population with ages of 0-14 years old that may be beneficial for the professionals as both clinical and research tools.
Izabela Chojnicka <i>et al.</i> (2019)	1230 participants in the age range of 3-14 years.	To adapt SSP-2, to analyse psychometric characteristics of the Polish version of SSP-2, and to develop specific norms according to the standards for norm development	Translation process was done on the basis of International Test Commission (ITC) recommendations. The reliability and validity of the questionnaire were estimated using several methods, including internal consistency, test-retest, and factor analysis.	This is the 1st study on non-English-speaking participants using a revised version of the instrument. The SSP-2-PL is characterized by high reliability, both in terms of internal consistency and stability of scores and it discriminates well between children with neurodevelopmental disorders and those exhibiting typical development. SSP-2 overall score could be used for screening purposes.

The researcher compiled studies through a systematic approach to review the existing literature [Table 2]. The objective of this literature review was to analyse existing studies on the translation and cultural adaptation of Short Sensory Profile 2 in various languages from 2014 to 2022 across the globe and then propose further recommendations for future research. The themes of the literature review are discussed below.

3.1 Translation process of Short Sensory Profile 2

In the study conducted by Shahbazi *et al.* (2021) [20], the translation process was conducted via AERA and ITC guidelines. This methodology is accepted internationally in the cultural adaptation of assessment tools as it ensures maximum conceptual and semantic equivalence with the original version of the tools. The detailed forward and backward translation procedures by the bilingual professionals in close contact with American and Persian Culture resulted in a translation reflection common language used in Iran. To ensure the adapted version retained its equivalence when used by the target group, they conducted interviews with the participants (caregivers and teachers who have regular contact with the child). These semi-structured interviews were applied in the cultural adaptation of the questionnaires to identify and correct comprehension problems of items which might be confusing.

In the study conducted by Chojnicka *et al.* (2019) [21], they mentioned that the way parents perceive and evaluate their child's behaviour and notice health or developmental problems depends on multiple factors, including social and cultural ones. Therefore, it seems worthwhile to heed the recommendation of the ITC to investigate the properties of diagnostic instruments in the context of particular language and culture. It was found that SP-2-PL preserves content equivalence with the original version.

3.2 Testing the psychometric properties

In the study conducted by Shahbazi *et al.* (2021) [20], content validity, internal consistency, test-retest reliability and standard error of measurement was assessed. The experts in the study agreed that the content of the test is representative of the knowledge and skills in the test domain. It could maintain an excellent repeatability and stability of answers over time for participants. It maintained an acceptable range to an excellent level of internal consistency of answers over the score for participants.

Hence, professionals who use Persian version of Short Sensory Profile 2 can rely on the relevancy, stability, repeatability and consistency of the tool.

In the study conducted by Chojnicka *et al.* (2019)[21], The SSP-2-PL is characterized by high reliability, both in terms of internal consistency and stability of scores. It can discriminate well between the children with neurodevelopmental disorders and typical development. They recommended further analysis of the questionnaire's factor structure as they could shed more light on its usefulness as a screening tool and also a method for determining patterns of sensory processing and sensory subtypes among children from the general population and those with neurodevelopmental disorders.

4. Discussion

Sensory processing issues can be recognized from the initial years of birth of the children. It can be found in children with neurodevelopment disorders or with no other diagnosis at all. Sensory Processing Disorder may affect the child's participation in different communities such as home, school, playground, etc. for example, children may have difficulty to sit still, aversion to certain textures of food and clothes, and fear of swing and other playground equipment. Hence it is necessary to identify the sensory issues in the early years of children and provide early intervention to them.

Short Sensory Profile 2 is the commonly available tool for the purpose of screening sensory modulation difficulties among the children. From the literature review it is found that the Short Sensory Profile 2 questionnaire has been translated to languages such as Persian and Polish. The studies show that both the translated versions had good psychometric properties.

According to the 2011 Census, 10.6% of the population of India can speak English and only 20.1% of the population of Kerala can speak English. No studies were found related to understanding abilities and readability of English language among Indians.⁵To meet the needs of the different language speaking population in India, it is necessary to translate it into different regional languages of India in order to assess sensory modulation deficits in the non-English speaking population. Though translation of tools is necessary for assessing the needs of non-English-speaking caregivers, it is essential that the information and intention of the tool are adequately maintained during the translation process. Hence,

in future, translation and standardization of Short Sensory Profile 2 in different languages are suggested.

5. Conclusion

This review study on "Translation and cultural adaptation of Short Sensory Profile 2 in various languages" showed that the questionnaire was translated and culturally adapted into Persian and Polish languages. The professionals and the target population such as non-English speaking caregivers of the children found it helpful. Although the studies had limitations such as selection of subjects from a single urban centre, which may limit the generalization of the findings, and the unavailability of other standardized instrument in Persian and Polish to measure that processing, both versions were found to be a useful screening tool.

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