CONSTRUCT VALIDATION AND RELIABILITY ANALYSIS OF THE SELF-ASSESSMENT OF OCCUPATIONAL FUNCTIONING INSTRUMENT FOR DEAF PEOPLE IN THE BRAZILIAN SIGN LANGUAGE

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ABSTRACT

Objective: to assess construct validity and reliability of the Self-Assessment of Occupational Functioning Scale in its Brazilian Sign Language version with deaf people.

Methods: a methodological research study, with a sample of 121 deaf individuals, conducted virtually from January 2018 to July 2019 with dissemination throughout Brazil. Collection took place from the Self-Assessment of Occupational Functioning Scale in its transculturally adapted version for the Brazilian Sign Language. For the analysis of construct validation, the *Student*'s *t* test for independent samples was used, while internal consistency was tested with the Kuder-Richardson test. Reproducibility was analyzed by means of the test-retest technique, using the McNemar test for the items and the Intraclass Correlation Coefficient and Pearson's correlation coefficient for the scores of the domains.

Results: the Self-Assessment of Occupational Functioning Scale, in its version in Brazilian Sign Language, showed to be valid and reliable for the sum of the scores, and the mean of the domains obtained good internal consistency both in the total score (0.89) and for the items of the instrument.

Conclusion: the instrument showed to be valid and reliable for deaf people. Offering a validated instrument to deaf individuals may provide this collective with the opportunity to expose their needs or demands regarding occupational functioning, allowing both health professionals and researchers in the area to plan care and research studies in a more inclusive and targeted manner, enabling benefits for the deaf.

DESCRIPTORS: Sign languages. Validation studies. Occupational therapy. Deafness. Surveys and questionnaires.

VALIDAÇÃO DE CONSTRUCTO E ANÁLISE DA CONFIABILIDADE DO INSTRUMENTO AUTOAVALIAÇÃO DO FUNCIONAMENTO OCUPACIONAL PARA SURDOS EM LÍNGUA BRASILEIRA DE SINAIS

RESUMO

Objetivo: avaliar a validade de constructo e a confiabilidade da Escala de Autoavaliação do Funcionamento Ocupacional em sua versão em Língua Brasileira de Sinais com surdos.
Método: pesquisa metodológica, com amostra de 121 surdos, no período de janeiro de 2018 a julho de 2019, realizada de maneira virtual com divulgação em todo o Brasil. A coleta foi realizada a partir da Escala de Autoavaliação do Funcionamento Ocupacional em sua versão adaptada transculturalmente para a Língua Brasileira de Sinais. Para a análise da validação de constructo, utilizou-se o teste *t* de *Student* para amostras independentes, enquanto a consistência interna foi testada por Kuder-Richardson. A reprodutibilidade foi analisada pela técnica teste-reteste, utilizando-se o teste de McNemar para os itens e o *Intraclass Correlation Coefficient* e o coeficiente de correlação de Pearson para os escores dos domínios.
Resultados: a Escala Autoavaliação do Funcionamento Ocupacional, em sua versão em Língua Brasileira de Sinais, mostrou-se válida e confiável para a soma dos escores e a média dos domínios teve boa consistência interna no escore total (0,89) e boa consistência interna para os itens do instrumento.
Conclusão: o instrumento mostrou-se válido e confiável para os surdos. Ofertar um instrumento validado aos surdos poderá proporcionar, a esse coletivo, a oportunidade de expor suas necessidades ou demandas no que concerne ao funcionamento ocupacional, permitindo, aos profissionais de saúde, assim como aos pesquisadores da área, planejar o cuidado e as pesquisas de forma mais inclusiva e direcionada, viabilizando benefícios à comunidade surda.

DESCRITORES: Línguas de sinais. Estudos de validação. Terapia ocupacional. Surdez. Inquéritos e questionários.

VALIDACIÓN DE CONSTRUCTO Y ANÁLISIS DE LA CONFIABILIDAD DEL INSTRUMENTO DE AUTOEVALUACIÓN DEL FUNCIONAMENTO OCUPACIONAL PARA PERSONAS SORDOS EN EL LENGUAJE DE SEÑAS BRASILEÑO

RESUMEN

Objetivo: evaluar la validez de constructo y la confiabilidad de la Escala de Autoevaluación del Funcionamiento Ocupacional en su versión en el Lenguaje de Señas Brasileño con personas sordas.
Método: investigación metodológica, con una muestra de 121 personas sordas, realizada entre enero de 2018 y julio de 2019 de manera virtual con divulgación en la totalidad del territorio de Brasil. Los datos se recolectaron a partir da Escala de Autoevaluación del Funcionamiento Ocupacional en su versión adaptada transculturalmente para el Lenguaje de Señas Brasileño. Para el análisis de la validación de constructo, se utilizó la prueba *t* de *Student* para muestras independientes, mientras que la consistencia interna se evaluó mediante la prueba de Kuder-Richardson. La reproducibilidad se analizó por medio de la técnica test-retest, empleando la prueba de McNemar para los ítems y el *Intraclass Correlation Coefficient* y el coeficiente de correlación de Pearson para los puntajes de los dominios.
Resultados: la Escala de Autoevaluación del Funcionamiento Ocupacional, en su versión en el Lenguaje de Señas Brasileño, demostró ser válida y confiable para la suma de los puntajes, y la media de los dominios obtuvo buena consistencia interna tanto en el puntaje total (0,89) como para los ítems del instrumento.
Conclusión: el instrumento demostró ser válido y confiable para las personas sordas. Ofrecer un instrumento validado a las personas sordas podrá proporcionar a este segmento de la población la oportunidad de exponer sus necesidades o demandas en relación con el funcionamiento ocupacional, permitiendo así que tanto los profesionales de la salud como los investigadores del área planifiquen la atención y los estudios de investigación de manera más inclusiva y direccionada, viabilizando beneficios para la comunidad sorda.

DESCRIPTORES: Lenguajes de señas. Estudios de validación. Terapia ocupacional. Sordera. Encuestas y cuestionarios.

INTRODUCTION

The World Federation of the Deaf (WFD)[1] indicates that there are nearly 70 million deaf people in the world. In Brazil, data from the Brazilian Institute of Geography and Statistics (*Instituto Brasileiro de Geografia e Estatística*, IBGE)[2]** show that 9.7 million people report some hearing impairment and that 344,200 state being deaf. These numbers are significant and demand attention from researchers who are focused on the health of the deaf, as well as from public managers. Contrary to the expressive numbers presented, translated, adapted and validated research instruments for the deaf population are still scarce[1]. This gap in scientific productions highlights the need to expand the conduction of methodological studies aimed at health instruments for deaf people.

The barriers faced by deaf individuals, especially the communication barrier, directly impact on their daily lives, activities and occupations. Communication barriers involve personal and environmental factors that affect occupational performance. Due to communication difficulties, many deaf individuals live in marginalized environments, resulting in decreased participation in socialization, work and education[2], which are important occupations. Understanding the perception of these people about how they feel able to carry out their activities and, consequently, their occupational functioning becomes important for the development of policies and actions that ensure better health conditions and well-being for these individuals.

The Model of Human Occupation (MOHO) comprises three central human components: volition, habituation, and performance capacity, relating occupational behavior as a result of the relationship of these components with the environment[3]. This is an important model for occupational therapists. In Brazil, the literature points to the need for scientific and clinical advances to expand the adoption of the MOHO[4]. There is also a report of the availability of few instruments validated for use in the national territory that contemplate this model[4]. Among the existing tools, the Self-Assessment of Occupational Functioning Scale stands out, which in this manuscript will be highlighted with the abbreviation of the original version in English: SAOF.

SAOF was recently adapted for the Brazilian deaf population and translated into Brazilian Sign Language (Libras)[5], presenting results only regarding content and face validation. Given this fact, this research proposes to add insights, seeking to investigate the reliability and validation of the instrument's construct, thus ensuring greater clarity regarding sensitivity and validity for the referred population.

Offering a validated instrument to the deaf will provide this collective with the opportunity to expose their needs or demands regarding occupational functioning, allowing professionals to survey appropriate demands for more efficient therapeutic plans, increasing the chances of including deaf people in surveys and research studies, providing benefits to the academic community and managers in the proposal of more assertive policies and actions, in addition to corroborating the improvement in accessibility and equal assistance in the different health services.

Given the above, this study sought to assess the construct validity and reliability of the SAOF scale in its version in Libras with death people.

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1 *Data from the WFD available in: https://wfdeaf.org
2 **Results presented in the 2010 Demographic Census by IBGE. available in: https://censo2010.ibge.gov.br/resultados.html

METHOD

This research is characterized as a validation methodological study. Construct validation of the SAOF-Libras version of the known-groups type was performed, as well as reliability validation by evaluating the internal consistency of the instrument's items and by applying the test-retest technique.

SAOF is a self-administered clinical instrument, which can also be conducted by an interviewer, used with people aged between 14 and 85 years old[6]. The main construct of the instrument, occupational functioning, assesses the interaction between the person and occupational areas and the perception of their performance and process[7]. The score reflects the person's opinion about their own potentialities and limitations in different areas[7].

The version in Libras, subjected to the validation process in this research, went through the cross-cultural adaptation process[5], following the methodology for translation into Sign Language (SL) based on evidence[8]. SAOF-Libras is part of the version adapted to Brazilian Portuguese[7] and is made up by 35 items, with answer options between 'yes', 'no' and 'I don't know'. The answer scale for the items of the SAOF-Libras version did not undergo changes either. For analysis purposes, a total score was generated for the instrument in which the more "yes" answers, the higher was occupational functioning.

The instrument measures seven areas of occupational functioning: personal causality or causation (how the person perceives in their expectations of failure or success in the actions performed); values (activities and performance established through standards and goals by the individual); interests (activities considered pleasant or pleasurable); roles (performance of behaviors and skills expected by society and shaped by culture); habits (daily actions from the organization and execution of tasks); skills (which assist in the physical and mental performance of everyday actions); and environment (which would involve the places and everything that involves them: people, objects and social resources)[7].

The study sample, with 121 deaf individuals, is characterized as non-probabilistic, by convenience, and of the snowball type. Although the sample size is smaller than that indicated in the literature for methodological studies (in which there should be a minimum of 200 participants)[9], other studies of the same nature with the deaf population had samples with 113 or even 96 participants[10–11], and a number of studies in Brazil with the SAOF research instrument presented samples with 62 and 139 participants[7,12].

The research had national reach, with dissemination and sample recruitment through written messages and videos in Libras, by means of social networks on the Internet in open and closed groups, after authorization for dissemination of the study by the page coordinator. Groups of associations, congregations, clubs, federations and general groups linked to the deaf were surveyed, using the keywords "Libras" or "deaf", reaching more than 50 online communities. In-person visits were also carried out to associations, schools and undergraduate courses in LETTERS-LIBRAS through interpreters and hearing individuals with direct contact with the community. The in-person meetings, held in the states of Minas Gerais, Sergipe and Rio Grande do Norte, offered a place and equipment, such as computers and Internet, for the research to be conducted after disclosure and acceptance for participation. The data collection period lasted 18 months, from January 2018 to July 2019.

Data collection was performed by browsing the https://www.pesquisalibras.com.br/ electronic site with guidelines and presentation of documents and research instruments adapted and translated to Libras[5]. The application used the online platform and the electronic form generated through the Google Forms tool. The choice for electronic means and forms accessible in Libras aims at the participants' autonomy. In this research, the following inclusion criteria were adopted: adult men and women, aged 18 years old or over, who declared themselves deaf, fluent in Libras, with access to the Internet and electronic tools (computers and cell phones), and with the following exclusion criteria: not having any disability associated with deafness. These criteria were collected by the participant's

self-statements from the sample characterization instrument. A video was presented along with the Free and Informed Consent Form (FICF) explaining the inclusion and exclusion criteria to participate in the research. The participants watched the video with the version in Libras and, after confirming completion of the research inclusion criteria, they clicked on the 'YES - I agree to participate' option. Those who declared themselves within the criterion corresponding to exclusion to participate had access to the website with the researchers' contacts for clarification, referrals and information. The participants had their identities protected and were not exposed to direct physical or biological risks, with the possibility of withdrawing from participation being ensured.

For the analysis of construct validity by known groups, the sample was subdivided based on socioeconomic variables such as gender and income, as well as subjects who had already sought a mental health service or professional and those who never did so, variables described in the sample characterization instrument. The choice of this variable is based on the assumption that deaf people are more likely to develop emotional disorders than their hearing peers[13] and that the sample would present participants with this characteristic, added to the fact that the instrument, in Brazil, was validated in a sample of people with mental disorders, proving to be sensitive and reliable for this population in hearing individuals[12]. For this analysis, mean scores of the factors by means of the *Student*'s *t*-test for independent samples were used, while Cohen's d was used to classify the magnitude of the difference between the means, with negligible classification for d-values<0.20, small from 0.20 to 0.49, moderate from 0.50 to 0.79 and large >0.80[14].

Internal consistency was calculated by means of Kuder-Richardson (KR-20), with 0.05[15] significance, an analysis equivalent to Cronbach's alpha coefficient; this choice was due to the fact that the instrument's answer scale is dichotomous: 'yes' and 'no' or 'I don't know'.

To analyze the instrument's reproducibility, the test-retest technique was chosen, using the McNemar test for the items, and the Intraclass Correlation Coefficient (ICC) and Pearson's correlation coefficient for the scores of the domains. For the correlation between the two application instances (test-retest), the following coefficients were adopted: low, below 0.4; moderate, from 0.4 to 0.74; and high, from 0.75 to 1[16].

The research variables were coded in an electronic spreadsheet, imported into the Statistical Package for Social Science (SPSS), version 22.0, for inferential and exploratory analyses. For the descriptive variables, the choice was to use central and variability measures for all the factors.

In the analysis phase of the reproducibility of the SAOF instrument, Libras version, with application of the test-retest technique, the reapplication period was from seven to 14 days after first collection. In the instrument's electronic form, the information of a future contact was foreseen, being reinforced in the video which includes the FICF translated into Libras. The second contact with the participants was via the email collected in the sample characterization instrument. A new link, controlled by the study researchers, was made available with the same structure of the instrument for the retest.

RESULTS

The results pointed to a sample mostly made up of women (57%), with participants aged between 26 and 35 years old (42.1%), single (72.2%), with an income of one minimum wage (42.1%), living with other people (83.5%), without children (79.6%), with incomplete Elementary or High School (34.7%), who declared to be working at the time of the research (37.2%) and not working (35.5%), but receiving retirement income or some governmental benefit.

In the sample characterization instrument, 62.8% of the participants also reported never having needed or resorted to any mental service or professional. This variable was investigated since the study population is described in the literature as with higher incidence of emotional disorders[12]. During construct validation by known groups, the "gender" and "own income" variables were significant in the areas/domains of personal causality (gender with p = 0.007*), skills (gender with p = 0.002* and income with p = 0.006) and in the total score, as shown in Table 1.

Table 1 – Measures of central tendency and variability for validity by known groups for the total score in a sample of deaf people. Brazil, 2018-2019. (n=121).

Variable	Total score			
	n	Mean	SD‡	p-value
Gender				
Male	52	29.03	4.44	0.005*
Female	69	26.47	7.55	
Schooling				
Without Higher Education	93	27.63	6.81	0.54
With Higher Education	28	28.50	5.75	
Lives alone				
Yes	20	28.80	4.33	0.47
No	101	27.64	6.93	
Has children				
Yes	25	25.80	6.27	0.08
No	96	28.36	6.57	
Is active in the labor market				
Yes	45	28.35	6.28	0.50
No	76	27.52	6.75	
Is married				
Yes	21	28.19	5.72	0.76
No	100	27.76	6.76	
Own income†				
Yes	88	28.58	5.98	0.041*
No	33	25.84	7.67	
Undergoes treatment with Mental Health professionals and/or services				
Yes	45	27.37	6.25	0.55
No	76	28.10	6.77	

Note: *Student's t-test with significance level of p < 0.05; †Continuous Cash Benefit income, retirement income or work; ‡SD: Standard Deviation.

Cohen's d test was applied to calculate the effect size, presenting sensitivity only to the gender variable, with moderate classification (0.51). Internal consistency assessment of the SAOF scale indicated low values for the items in its domains, but the sum of the scores and the mean of the domains showed good consistency in the total score (Table 2).

Table 2 – Measures of central tendency, variability and internal consistency of the domains based on the mean of the domains in a sample of deaf people. Brazil, 2018-2019. (n=121).

Domain	Minimum	Maximum	Mean	Median	SD‡	KR-20†
Personal causality	0.00	1.00	0.82	0.83	0.21	0.55
Values	0.00	1.00	0.82	1.00	0.25	0.43
Interests	0.33	1.00	0.84	1.00	0.23	0.29
Roles	0.14	1.00	0.80	0.85	0.21	0.60*
Habits	0.00	1.00	0.66	0.66	0.31	0.41
Skills	0.17	1.00	0.78	0.83	0.21	0.77*
Environment	0.00	1.00	0.81	1.00	0.38	
Total score	0.20	1.00	0.79	0.82	0.18	0.89*

Note: *Acceptable or satisfactory values; †KR-20=Kuder-Richardson 20; ‡SD=Standard Deviation.

In the reliability assessment, the interest, roles, habits, skills and environment domains and the total score presented significant values (Table 3). There was good reliability for the items, with no statistically significant difference between the test and the retest.

Table 3 – Reliability analysis of the domains of the Self-Assessment of Occupational Functioning Scale based on Pearson's test and on the Intraclass Correlation Coefficient test in a sample of deaf people. Brazil, 2018-2019. (n=121).

Domain	Mean		Median		Standard Deviation		ICC‡	p-value	r†	p-value
	Test	Retest	Test	Retest	Test	Retest				
Personal causality	5.33	5.44	6.00	6.00	1.03	0.82	0.13	0.21	0.13	0.41
Values	2.64	2.59	3.00	3.00	0.66	0.63	0.14	0.19	0.13	0.39
Interests	2.64	2.64	3.00	3.00	0.58	0.62	0.29	0.03*	0.28	0.07
Roles	5.87	5.90	6.00	6.00	1.21	1.27	0.28	0.04*	0.28	0.08
Habits	2.00	2.15	2.00	2.00	0.68	0.70	0.53	<0.001*	0.54	<0.001*
Skills	9.57	9.51	11.00	10.00	2.41	2.74	0.45	<0.001*	0.44	<0.001*
Environment	0.92	0.85	1.00	1.00	0.27	0.36	0.38	<0.001*	0.41	<0.001*
Total score	29.08	29.08	32.00	30.00	5.19	5.97	0.47	<0.001*	0.47	<0.001*

Note: *Significance Level, $p < 0.05$; †r=Pearson's Test; ‡ICC=Intraclass Correlation Coefficient.

DISCUSSION

When analyzing the description of the sample under study, it is verified that other studies with deaf people have recruited samples with similar characteristics. For example, regarding the predominance of women, 60%, 58% and 57.2% of the sample are reported[10,17–18], in the age group of young adults, with results such as 38% of the participants[10], and marital status with a majority of single individuals, with 47.3%[18]. When analyzing the profile of deaf people in this sample, referring to the mean family income, the minimum wage value was the most reported. In construct validation, the "gender" and "income" variables were the most sensitive.

The literature has pointed out the increased participation and visibility of women in different contexts, with increased access to education[19]. Currently, there is a discussion about the importance of teaching the deaf person to be bilingual, with a pedagogical methodology consistent with the linguistic needs, respecting the cultural and cognitive traits of this population[20]. However, in Brazil, the struggle for bilingual education is still a reality[20] and can exert a direct impact on qualification and on attaining a place in the labor market. There is an absence space for working women in this discriminatory historical process, resulting in a restricted labor market with remunerations close to or with values equal to those of the BPC[21]. In the literature, it is reported that entry into the labor market, until recently, was discouraging, as it extinguished the right to the BPC[21].

In this research, the family income reported by the majority was one minimum wage, bringing to reflection aspects related to access to the labor market for this population. In other countries, the relationship between gender, schooling and work for the deaf population has presented similar results[22], which can directly impact on occupational functioning. According to data from the Special Education Program of the Education Department in Washington, United States, by the National Center for the Deaf, deaf American women have lower employment rates, 27%, and when the race, ethnicity and gender variables are associated, the results are even more significant. According to the same document, the employment rates and annual income of deaf people record increases proportional to their higher schooling levels[22].

Given these reflections, since the "gender" and "income" variables are sensitive to the instrument's domains and items in this population, the need for future research studies on these variables associated with occupational functioning is raised.

The variable related to the search for mental health services and professionals pointed to results that contradict data surveyed in the literature. A number of studies have pointed out higher illness rates related to mental health in deaf individuals[23]. When compared to hearing individuals, deaf people would experience from two to three times more emotional difficulties than hearing individuals, and are three to five times more likely to develop severe emotional disorders[12].

The accessibility challenge in the health services can even reveal obstacles in the choice to seek services and professionals. Lack of preparation and the communication barrier have been pointed out in recent studies[24–25].

The findings in the validation process of SAOF-Libras version corroborate the validation results of the instrument for its version in Brazilian Portuguese[7]. SAOF for Brazil, in Portuguese, obtained good validity and reliability in its first version and in the adapted version, tested in a sample of 50 subjects[7]. SAOF-Libras obtained good reliability of its items. In the case of the domains, the total score showed good reliability. The values found in the "personal causality" and "values" domains point to the need for future research studies regarding their constructs for that population. There are two domains with extremely subjective answers and constructions, since personal causality or personal causation corresponds to the person's thoughts and feelings about their performance in the activities of daily living, directly linked to the sense of how they see themselves capable, recognize strengths and weaknesses, while the values emerge from the beliefs and commitments about what is right, worthwhile, and important[26]. The more abstract a variable, the more difficult it becomes to establish its construct validity[27].

The SAOF version in English presented acceptable results in the reliability test[28], while in the Kappa test the items presented low agreement, which, according to the authors, can be related to the lack of clarity about certain items in the English version.

The internal consistency of the version in Libras obtained a good value (0.89) in the total score. This score is similar to that found in the study of the instrument in English, with a result of 0.88 for the total score[28]. The effect size in the study of the Libras version, calculated by Cohen's d, was sensitive only to the gender variable, with a moderate result. New studies with larger samples are suggested.

The literature points out that the significance level is affected by several characteristics, with sample size being the most determinant, which would bring to the discussion that, even in reduced samples, the *p*-value may not be significant, even if the effect size may be large[29]. In this research, effect size was evaluated by Cohen's d and, although the p-value provides the probability of obtaining a significant statistic, it is to be noted that the clinical or practical importance of the results cannot be informed and, even if the difference between the means of the two groups presents a statistically non-significant result, it does not mean that there is no difference, but that there is no evidence to reject the null hypothesis that there are no differences, that is, it is highlighted that the result may be inconclusive[29], requiring new studies.

Given the aforementioned discussion, it is noteworthy that the greater sensitivity to the "gender" and "income" variables instigate new studies that can associate these variables and investigate the impact on occupational functioning in deaf people, since the instrument proved to be reliable and valid with deaf SL speakers.

In the development of the research, this study presents as a limitation the number of participants in the sample and the use of digital platforms for dissemination and data collection. Despite the challenges found and the possibility that using these tools limit the study, it becomes necessary to emphasize that the use of these technologies increases autonomy for participation and has been reported as satisfactory by participants in other studies with this population[6]. Added to these findings is the fact that the elaboration of the version in Libras, in a format for online use in digital platforms, facilitated the subsequent availability of the instrument free of charge. Interested professionals and researchers can access the research site at https://www.pesquisalibras.com.br/ and have access to use and apply SAOF-LIBRAS. Finally, the scarcity of current productions and in the area under study is highlighted, hindering comparisons of the results.

CONCLUSION

This research showed that the Self-Assessment of Occupational Functioning Scale, in its version in Libras, proved to be valid and reliable, replicable and with good internal consistency. Although the mean of the domains presents a satisfactory result, the possible weakness of the instrument regarding the items stands out, with low values and in need of further research regarding the basic constructs. Offering a valid instrument to the deaf people provides greater equality to survey demands, propose more efficient therapeutic plans, and include deaf people in surveys and research studies.

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NOTES

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