Original article

Cross-cultural adaptation, reliability, and content validity of the Brief Negative Symptom Scale (BNSS) for use in Brazil

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Abstract

Background: The Brief Negative Symptom Scale (BNSS) assesses the presence and intensity of negative symptoms in schizophrenia. **Objectives:** This study aimed to carry out the BNSS cross-cultural adaptation to the Brazilian Portuguese language and verify its content validity and reliability. **Methods:** This is a methodological study that followed these steps: (1) implementation of the cross-cultural adaptation and translation protocol, (2) BNSS adapted content validation, and (3) reliability assessment. Six experts participated in the adaptation process. The sample consisted of 30 individuals diagnosed with schizophrenia and assisted at the Brazilian Psychosocial Care Center (CAPS), in João Pessoa, Paraíba, Brazil, which was the research setting. **Results:** The cross-cultural adaptation was successful due to the values obtained for each aspect evaluated, such as semantic (0.922), idiomatic (0.910), experiential (0.961), and conceptual equivalence (0.974). The same happened with content validity regarding clarity of language (0.935), practical relevance (0.974), and theoretical relevance (0.948). Cronbach's alpha coefficient was 0.884 for the entire instrument, and the items ranged from 0.865 to 0.882. **Discussion:** The BNSS adaptation process has shown to be satisfactory for use in the Brazilian context, constituting a useful clinical tool for teaching and research.

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Keywords: Negative symptoms, cross-cultural adaptation, schizophrenia, validation studies, blunted affect.

Introduction

Negative symptoms are a core feature of schizophrenia and they are associated with poor prognosis, increased long-term morbidity, and impaired social and occupational functioning[1,2]. There is little improvement in these symptoms by a pharmacological approach or psychosocial interventions[3,4].

Due to the need to standardize language and study on negative symptoms, in 2005 the U.S. National Institute of Mental Health (NIMH) organized a conference on negative symptoms[5]. The NIMH had previously focused its attention on cognitive impairments in schizophrenia and potential therapeutic targets for them, through the project Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS)[6]. The MATRICS success has sparked similar projects addressing studies on negative symptom[5]. This 2005 conference defined five symptoms as belonging to the negative domain, including anhedonia, asociality, avolition, blunted affect, and alogia, and it also clarified the understanding of some issues, such as: negative symptoms constitute an area that requires developing specific therapy; they do not belong to the cognitive domain; the scales used to assess negative symptoms (Scale for the Assessment of Negative Symptoms – SANS – and the Positive and Negative Syndrome Scale – PANSS) had among their items symptoms that did not belong to the negative domain, so there was a need to develop new instruments that address the five negative symptoms mentioned above[5]. Thus, the Brief Negative Symptom Scale (BNSS)[7] and the Clinical Assessment Interview for Negative Symptoms (CAINS)[8] were created.

The BNSS has been developed to provide a brief and effective measurement of negative symptoms. This is a 13-item instrument, based on a semi-structured interview and organized into 6 subscales. It is quick to apply, around 15 minutes, and can be used both in the research and teaching context and in the clinical routine of care for the patient with schizophrenia. From items 1 to 8, the score is made according to a series of questions to patients, while items 9 to 13 are scored according to the raters observation throughout the interview. The scale has validations in several countries, with adequate psychometric properties in all studies[9-13]. The BNSS has

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also been developed according to other principles, such as allowing the items to be evaluated in various cultures, distinguishing between anticipatory and consummatory anhedonia, distinction, at the time of assessing asociality and avolition, between internal experience and external behavior, and it does not encompass items that, according to factorial analysis studies, are more associated with the disorganized/cognitive domain than the negative one, such as poor speech content and attention deficit[7].

The BNSS adaptation for use in Brazil contribute so that Brazilian scholars and psychiatrists can improve research on negative symptoms, both regarding their identification, evaluation of response to the treatments used and the association between negative symptoms and prognosis in schizophrenia.

Given the above, this study aimed to carry out the BNSS cross-cultural adaptation to verify its content validity and reliability

Methods

Ethics approval and consent to participate

This study has been approved by the Research Ethics Committee of the Federal University of Pernambuco (UFPE), under the Brazilian Certificate of Submission for Ethical Assessment (CAAE) no. 51949915.2.1001.5208. The BNSS cross-cultural adaptation and validation process has received email authorization from Dr. Brian Kirkpatrick and all study participants have agreed to take part in it.

All participants were informed that the findings of this study would be published and their identities would not be publicly disclosed in this publication. All participants have agreed and provided their written consent.

Participants

Thirty individuals diagnosed with schizophrenia according to the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5) criteria[14] were included in the study.

The inclusion criteria were: (1) clinical diagnosis of schizophrenia, (2) age between 18 and 65 years, (3) clinical stability, which has been conceptualized as no change in antipsychotic drug use within the last 4 weeks, (4) undergoing treatment at the CAPS for at least 6 months. The exclusion criteria were: (1) history of neurological disease, (2) abusive use or addiction to psychoactive drugs within the last 6 months.

BNSS cross-cultural adaptation for use in Brazil

This was a methodological study of the BNSS cross-cultural adaptation for use in the Brazilian context. The criteria recommended by the developers of this scale were supplemented with the criteria by Beaton *et al.*[15], which are among the most widely used in the literature for cross-cultural adaptation of instruments that measure health-related phenomena.

Step 1: Initial translation (T1 and T2): this consisted of two independent translations from English into Portuguese, made by professionals who were fluent in English and whose native language was Portuguese. One of them came from the mental health field and knew the research purposes. The other translator did not come from the health field and did not know the research purposes.

Step 2: Translation syntheses: the translators produced a report containing doubts about technical terms and phrases used in the scale. The researcher evaluated the versions T1 and T2, as well as the report produced, providing the BNSS version named as T12.

Step 3: Back translation: it was conducted by two translators whose native language was English and they were fluent in Portuguese, based on the T12 version. None of them came from the medical field. Once the process (initially double-blinded) was over, the two translators met and produced the first back-translated BNSS version (named as TR12).

The back-translated version (TR12) was sent to one of the scale's developers (Dr. Strauss) for analysis regarding discrepancies and linguistic and cultural constraints. An expert commission consisting of members of the BNSS developers' team specifically trained to work with the scale translation process into other languages, compared TR12 to the original scale and sent to the researcher a document named as 'reconciliation document,' with suggestions for improving the instrument's cross-cultural adaptation process. The suggestions were accepted by the researcher; new translation and back-translation were required, carried out by the same translators, which originated a document named as T12 – version 2 (T12-2), and this, in turn, generated a second TR12 version (TR12-2). This version was sent to Dr. Strauss; it was analyzed by the BNSS committee and considered satisfactory, receiving a translation certification (T12-2 and TR12-2).

Step 4: Expert committee: consisting of 6 experts, who compared the BNSS T12-2 version to the original version. Modifications were made in the T12-2 following the committee's guidelines, which generated the BNSS pre-final version. This version was used in step 5. These procedures provided the face validity and scale content analyses.

Step 5: Pre-test study: in this phase, the pre-final version was applied to a 30-user sample monitored in the CAPS, according to the sample size recommended by Beaton *et al.*[15]. The probe technique was used, which consists in reading to patients each scale item, where the interviewer probes whether the questions were understood and asks the individuals to explain in their own words what they understood[16]. In cases of doubts about any of the items, the researcher explained it and asked the participant to provide synonyms and alternative words to clarify the item. This procedure was performed with each participant and when there was any doubt about an item, the word was replaced by a simpler one, before the scale was applied again to the next individual. As a result of this procedure, changes were cumulatively incorporated until the research participants had no further questions. Sociodemographic and clinical data were also collected.

Data analysis

Descriptive statistical analysis consisted in mean values, standard deviations, and percentages to describe the sociodemographic and clinical sample characteristics. Scale data for evaluating cross-cultural adaptation were analyzed using the concordance index calculation. The statistical software Statistical Package for the Social Sciences (SPSS), version 24, was used.

BNSS face validity and content

Content validity was determined by experts through semantic, idiomatic, experiential, and conceptual equivalence, according to the precepts provided by Guillemin *et al.*[16]. The instrument's clarity of language, as well as its practical and theoretical relevance, were also assessed. The concordance index (CI) was > 0.80, regarded as satisfactory by experts[17].

For each scale item there are 7 possible answers, with scores ranging from 0 to 6, 0 means absence of symptoms and 6 means presence of symptoms and/or clinical signs at a maximum degree. When considering 7 possible answers to 13 items, we have 91 assessment possibilities. It was understood that this large number of evaluations might make the expert committee's work impossible, so it was decided not to submit this question to the committee, but to consider the adaptation certification issued by the BNSS committee itself.

BNSS reliability related to the pre-final sample data

Reliability was measured by the instrument's internal consistency, calculated using Cronbach's alpha for the 13 scale items. Values > 0.7 were considered satisfactory[18]. Also, the Spearman's correlation coefficient was calculated to measure each item's influence on the whole instrument's internal consistency.

Results

Participants' sociodemographic and clinical data

The participants' clinical and demographic characteristics are shown in Table 1. The sample is predominantly male, brown-skinned, with 7.5 years of school education in average (SD = 5.9), most of them unmarried (83.3%) and retired due to schizophrenia (64.3%). All participants were treated with antipsychotic drugs, predominantly second-generation ones (80%). The mean age of symptom onset was 28.2 years (SD = 13.2) and the time of disease was 13.7 years (SD = 10.2). The BNSS total score averaged 28.3 points (SD = 11.4).

Table 1. Demographic and clinical data of 30 participants included in the pre-final sample

Variables		
Age (years, mean ± SD)	41.9	13.1
Male (%)	66.7	
Singles (%)	83.3	
Brown (%)	46.6	
Education (years, mean ± SD)	7.5	5.9
Retired due to disease (%)	64.3	
Age of onset (years, mean ± SD)	28.2	13.2
Duration of illness (years, mean ± SD)	13.7	10.2
Second generation (%)	80.0	
First generation (%)	20.0	
BNSS scorea (mean ± SD)	28.3	11.4

[a] Mean: mean value per item.

Expert committee's results

Table 2 shows a comparison between the original version items to the T12-2 version ones, as well as the changes suggested by the expert committee, and finally the changes made after the pre-test phase, through the probe technique applied to the patients.

The concordance index for idiomatic equivalence was < 0.8 only for item 4, generating title changes for "ausência de emoções desagradáveis normais". When analyzing the general average scale values, there was satisfactory semantic (0.922), idiomatic (0.910), experiential (0.961), and conceptual equivalence (0.974) (Table 3).

The assessment based on language clarity (0.935), practical relevance (0.974), and theoretical relevance (0.948) achieved satisfactory scores (Table 4).

Pre-test phase results

During the interview, some patients did not adequately understand some questions asked and suggested changes, which occurred mainly in items 2, 3, 5, and 7, resulting in the BNSS final version (Table 2).

BNSS pre-final version's reliability

In order to expand the cross-cultural adaptation process, the BNSS pre-final version's reliability was found, where Cronbach's alpha ranged from 0.865 to 0.882 per deleted item and 0.884 for the 13 items (Table 5).

Table 2. Original scale, version T12-2, pre-final version after committee evaluation and BNSS final version after the pre-test phase

BNSS original scale items	BNSS T12-2 version items	Pre-final version after expert committee analysis	BNSS final version after the pre-test phase
Items 1 and 2 In the past week, was there something else that felt good physically... How often did you do that?	Na semana passada, houve outra coisa que fez você se sentir bem fisicamente... Se sim: Com que frequência você usufruiu disso?	…houve alguma outra coisa… Se sim: Com que frequência você fez isso?	
How often did you enjoy doing that?	Quantas vezes você gosta de fazer isso?	Com que frequência você se divertiu fazendo isso?	
How often when you're working (or studying) do you enjoy it?	Quando você está trabalhando (ou estudando), com que frequência você desfruta dessa atividade?	Quando está trabalhando ou estudando, com que frequência você aprecia essa atividade?	Quando está trabalhando ou estudando, com que frequência você gosta dessa atividade?
Item 3 Is there something else you would enjoy doing? If the subject did not enjoy any activities in the past week: Are there any activities that you are looking forward to?	Existe alguma coisa que você gostaria de fazer em substituição? Se o indivíduo não gostou de todas as atividades na semana passada: Existem algumas atividades que você está empolgado para fazê-las?	Há algo mais que você gostaria de fazer? Se o indivíduo não gostou de qualquer atividade na semana passada: Existe alguma atividade que você está animado para fazer?	Existe alguma outra coisa que você gostaria de fazer Existe alguma atividade que você fica na expectativa para fazer?
Item 4: Lack of Normal Distress	Ausência usual de emoções desagradáveis	Ausência de emoções desagradáveis normais	
Item 5 Did you contact them or did they contact you? How often do you talk to them about private, personal things?	Você entrou em contato com eles ou eles fizeram contato com você? Quantas vezes você fala com eles sobre coisas privadas, particulares	...Ou eles entraram em contato com você Com que frequência você fala com eles sobre assuntos particulares?	Com que frequência você fala com eles sobre coisas pessoais?
Item 6 Do you feel close to (the people discussed above)? Do you think about (people discussed above) much? Do you wish you were closer?	Você se sente perto das pessoas mencionadas acima? Você pensa muito sobre as pessoas citadas acima? Você gostaria de estar mais perto?	Você se sente próximo das pessoas mencionadas acima? Você pensa muito nelas (nas pessoas citadas acima)? Você gostaria de estar mais próximo delas?	
Item 7 (If in a treatment program, and question is appropriate): Did someone encourage you to do that, or did you do it on your own?	(Se estiver em um programa de tratamento, e a pergunta é adaptada): Alguém encorajou você a fazer isso, ou você fez isso sozinho?	(Se estiver em um programa de tratamento e a pergunta for apropriada): Alguém encorajou você a fazer isso, ou você fez por sua iniciativa?	Alguém encorajou você a fazer isso, ou você fez por conta própria?
Item 8 (If an explanation is needed: motivated about bathing, cleaning your home, taking care of your health, etc.)	(Se for necessária uma explicação: motivado sobre o banho, a limpeza de sua casa, cuidar de sua saúde etc.)	(Se for necessária uma explicação: motivado para tomar banho, limpar sua casa, cuidar da sua saúde etc.)	

Table 3. Equivalence assessment of the BNSS pre-final version

BNSS item	Equivalences			
	Semantic	Idiomatic	Experiential	Conceptual
1	0.833	0.833	0.833	1.000
2	0.833	0.833	1.000	1.000
3	1.000	0.833	1.000	1.000
4	0.833	0.666	0.833	0.833
5	0.833	1.000	1.000	1.000
6	0.833	0.833	1.000	1.000
7	0.833	0.833	1.000	0.833
8	1.000	1.000	0.833	1.000
9	1.000	1.000	1.000	1.000
10	1.000	1.000	1.000	1.000
11	1.000	1.000	1.000	1.000
12	1.000	1.000	1.000	1.000
13	1.000	1.000	1.000	1.000
Average of items	0.922	0.910	0.961	0.974

Table 4. Content validation of the BNSS pre-final version

BNSS item	Clarity of language	Practical relevance	Theoretical relevance
1	0.833	1.000	0.833
2	0.833	1.000	0.833
3	0.833	0.833	1.000
4	0.833	1.000	1.000
5	1.000	1.000	0.833
6	1.000	1.000	1.000
7	0.833	1.000	1.000
8	1.000	0.833	0.833
9	1.000	1.000	1.000
10	1.000	1.000	1.000
11	1.000	1.000	1.000
12	1.000	1.000	1.000
13	1.000	1.000	1.000
Average of items	0.935	0.974	0.948

Table 5. Cronbach's alpha coefficient and Spearman's correlation for the 13-item BNSS scale

BNSS items	Total item correlation[a] r	Alpha if item deleted
1 – Intensity of pleasure during activities	0.738	0.869
2 – Frequency of pleasurable activities	0.704	0.869
3 – Intensity of expected pleasure from future activities	0.763	0.865
4 – Lack of normal distress	0.697	0.868
5 – Asociality: Behavior	0.452	0.881
6 – Asociality: Internal experience	0.494	0.880
7 – Avolition: Behavior	0.545	0.877
8 – Avolition: Internal experience	0.482	0.881
9 – Facial expression	0.465	0.881
10 – Vocal expression	0.552	0.876
11 – Expressive gestures	0.450	0.882
12 – Quantity of speech	0.642	0.871
13 – Spontaneous elaboration	0.630	0.872

Cronbach's alpha coefficient for the BNSS scale (13 questions) = 0.884.
[a] Spearman's correlation coefficient.

Discussion

The study population's sociodemographic characteristics were similar to other studies, with a predominance of single individuals and a high retirement rate associated with the disease, which may be justified due to the functional impact of schizophrenia[19,20]. The average BNSS score was similar to other studies, except for sample size, ranging from 75 study participants in Switzerland and Turkey to 916 in Italy[9,11,12].

The instruments' cross-cultural adaptation process requires a methodological rigor that promotes greater semantic, conceptual, and experiential adequacy, in order to make it easier to understand the target population's new culture. Also, assessment by an expert committee whose members have different backgrounds contributed to the instrument analysis from various perceptions and perspectives[21].

Using the probe technique led us to replace some ambiguous words for others easily understood by the target population, just as in another Brazilian article on cross-cultural adaptation[22]. It is worth noticing that the content validation carried out by the target population differed in other cross-cultural adaptation studies conducted in Brazil, as they applied a semantic assessment tool[22-24]. However, schizophrenia is associated with significant cognitive deficits[25,26], making it difficult to execute/perform this assessment. Therefore, the main focus is making the measurement instrument for any health phenomena in people with schizophrenia as easy to understand as possible.

Given the above, it is worth noticing that just providing the translation of an instrument is not enough for its application to other cultures[15]. However, this practice was observed among Brazilian research, who provided only the translation and clinical validation of psychopathological assessment scales in schizophrenia[27-30]. Thus, this is the first Brazilian study to perform cross-cultural adaptation of an assessment scale in schizophrenia, going beyond the traditional translation/back-translation method.

Although the Cronbach's alpha for the Brazilian BNSS version was satisfactory, it was slightly smaller when compared to other validation studies of this scale in other countries[9,10,11,12]. The difference between values may be justified by the smaller sample size.

The main limitations of this study are sample size for assessing psychometric properties. However, considering that this article reports a cross-cultural adaptation, the size of sample follows the standards in literature[15]. Also, we address the scale's content validity and reliability in a pre-final sample.

Conclusion

This study allowed us to perform the BNSS cross-cultural adaptation for use in Brazil, showing that this is a user-friendly scale with adequate internal consistency. Thus, it contributes to research, teaching, and care by providing an important instrument to measure the negative symptoms in schizophrenia.

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