INTERNATIONAL JOURNAL OF PSYCHIATRY IN CLINICAL PRACTICE, 2016
VOL. 20, NO. 4, 265–271
http://dx.doi.org/10.1080/13651501.2016.1207086

Taylor & Francis
Taylor & Francis Group

ORIGINAL ARTICLE

Validation of Turkish version of brief negative symptom scale

Irmak Polat Nazlı[a], Ceylan Ergül[b], Ömer Aydemir[c], Swati Chandhoke[d], Alp Üçok[b] and Ali Saffet Gönül[a,e]

[a]Department of Psychiatry, School of Medicine, Ege University, Izmir, Turkey; [b]Department of Psychiatry, Istanbul School of Medicine, Istanbul University, Istanbul, Turkey; [c]Department of Psychiatry, School of Medicine, Celal Bayar University, Manisa, Turkey; [d]School of Medicine, Stony Brook University, Stony Brook, NY, USA; [e]Department of Psychiatry and Behavioural Sciences, School of Medicine, Mercer University, Macon, GA, USA

ABSTRACT

Objective: Negative symptoms in schizophrenia have been assessed by many instruments. However, a current consensus on these symptoms has been built and new tools, such as the Brief Negative Symptom Scale (BNSS), are generated. This study aimed to evaluate reliability and validity of the Turkish version of BNSS.

Methods: The scale was translated to Turkish and backtranslated to English. After the approval of the translation, 75 schizophrenia patients were interviewed with BNSS, Positive and Negative Syndrome Scale (PANSS), Calgary Depression Scale for Schizophrenia (CDSS) and Extrapyramidal Symptom Rating Scale (ESRS). Reliability and validity analyses were then calculated.

Results: In the reliability analysis, the Cronbach's alpha coefficient was 0.96 and item-total score correlation coefficients were between 0.655–0.884. The intraclass correlation coefficient was 0.665. The inter-rater reliability was 0.982 ($p < 0.0001$). In the validity analysis, the total score of BNSS-TR was correlated with PANSS Total Score, Positive Symptoms Subscale, Negative Symptoms Subscale, and General Psychopathology Subscale. CDSS and ESRS were not correlated with BNSS-TR. The factor structure of the scale was consisting the same items as in the original version.

Conclusions: Our study confirms that the Turkish version of BNSS is an applicable tool for the evaluation of negative symptoms in schizophrenia.

ARTICLE HISTORY
Received 27 July 2015
Revised 18 May 2016
Accepted 21 June 2016
Published online 12 July 2016

KEYWORDS
Negative symptoms; rating scale; schizophrenia

Objective

Negative symptoms are accepted as core features of schizophrenia. Mostly observed in cases with poor prognosis and chronic course, these symptoms have great impact on one's functioning in a number of aspects such as sociality, daily activities and even in self-care (Kirkpatrick et al. 2001; Galderisi et al. 2013). Even though current treatments have achieved sufficiency by addressing positive symptoms such as hallucinations, delusions and disorganised behaviour, negative symptoms usually do not respond to treatment. One possible reason for this might be inadequate evaluation of these symptoms by the clinicians, resulting in the need for more effective measurements (Marder & Kirkpatrick 2014). In spite of the diversity of negative symptoms and their importance on one's functioning, the current and most referred diagnostic tools, such as DSM-5 and ICD-10, count all of these symptoms in one item and this item is not mandatory in order to make the diagnosis (World Health Organization 1992; American Psychiatric Association 2013).

A number of measuring instruments have been developed for assessing negative symptoms. The Scale for the Assessment of Negative Symptoms (SANS) (Andreasen 1982), the Positive and Negative Syndrome Scale (PANSS) (Kay et al. 1987), and the Negative Symptom Assessment Scale (NSA) (Raskin et al. 1993) have been the most commonly used tools for this purpose. However, it is recognised that these scales include some items, which are not recently considered as negative symptoms for instance 'attention' item in the SANS, 'difficulty in abstract thinking' and 'stereotyped thinking' items in PANSS. In addition, the 'reduced emotional range' item in NSA accounts for both the loss of hedonia and negative emotions for that particular time period. Another scale, schedule for the deficit syndrome (SDS) generated by Kirkpatrick et al. has been used in order to differentiate negative symptoms according to their persistence, stability or presence due to secondary factors such as depression, anxiety, medications and so forth (Kirkpatrick et al. 2006).

Due to the need for adequate and consistent approach to negative symptoms in order for the clinicians and researchers to speak the 'same language' throughout the development of new pharmacological and non-pharmacological treatments, the National Institute of Mental Health organised the Measurement and Treatment Research to Improve Cognition on Schizophrenia (MATRICS) Consensus Development Conference on Negative Symptoms in 2005 (Kirkpatrick et al. 2006). The consensus defined five negative symptom domains as blunted affect, alogia, asociality, anhedonia and avolition. Following the definition of these items, two workgroups generated two new instruments for the assessment of negative symptoms: Brief Negative Symptoms Scale (BNSS) and Clinical Assessment Interview for Negative Symptoms (CAINS).

There are several advantages of BNSS. First of all, the scale is designed to be widely used for both clinical trials and non-clinical studies in the field of psychology. It is relatively concise and practical, consisting of only 13 items lasting approximately 15 min, whereas SANS may take 30 min, PANSS or CAINS covering the symptoms in more detail, may end up to 40–45 min (Kirkpatrick et al. 2011). The second advantage of BNSS is that, as well as

CONTACT Ali Saffet ali.saffet.gonul@ege.edu.tr Department of Psychiatry, Faculty of Medicine Hospital, Ege University, Bornova, Izmir, Turkey

consisting of the currently defined five negative symptom domains, it contains a sixth item: lack of distress. This item points to one's emotional functioning in more depth, that is, one's ability to experience not only pleasurable – as in anhedonia item but also unfavourable circumstances. Diminished emotional range is accepted as a core feature of deficit schizophrenia defined by a collection of primary and enduring negative symptoms (Kirkpatrick et al. 1989). Kirkpatrick et al. discussing the utility of this item for delineating patient groups subsequently mentioned that 'lack of distress' item successfully separated deficit and non-deficit schizophrenia that may lead to its use in differentiating patients with primary negative symptoms (Kirkpatrick et al. 2011; Strauss et al. 2012b).

Third advantage of BNSS and CAINS as well, over previously used scales is assessing both one's observable behavioural pattern in their personal or social lives and their inner sense and attitudes (Kirkpatrick et al. 2011). Due to particular external reasons (lack of money, limited access to transportation, lack of social support, etc.), one might not have a chance to do an act but still give an importance to it. On the other hand, throughout the treatment, internal experience may show improvement before carrying out an act. In these cases, commenting on this patient solely based on the act would lead the clinician to misjudge the condition of the patient and/or overlook the effect of therapeutic interventions or the changes in their neuropsychological constructs. (Strauss et al. 2012b).

Another important feature of BNSS is the evaluation of anhedonia in three aspects such as anticipation, consummation and frequency. Different reflections of pleasure between current and non-current feelings in schizophrenia patients has been indicated by Straus and Gold that the patients with schizophrenia are able to report similar 'in-the-moment' but less noncurrent pleasure when asked about hypothetic, past or possible future favourable situations (Strauss & Gold 2012). The elaboration in this subscale may help distinguish pathophysiology of anhedonia in future studies. Although the two new instruments include this concept, BNSS covers both the frequency and the intensity of pleasurable activities, whereas CAINS only focuses on the frequency, during different periods of time.

Both of these scales have strong inter-rater, test–retest reliability, validity and internal consistency (Kirkpatrick et al. 2011; Kring et al. 2013).

In this article, we present the translation and validation of the Turkish version of the BNSS (BNSS-TR).

To our knowledge, two validation studies are reported for the original version of BNSS. The first one was performed with 10 patients, but the following two studies included 100 and 146 patients. For the inter-rater reliability, the intraclass coefficient (ICC) is found as 0.96. For the internal consistency of the scale, Kirkpatrick et al. reported Cronbach's alpha as 0.93; item-total score correlation coefficients ranging from $r = 0.53$ ($p < 0.001$) to $r = 0.85$ ($p < 0.001$) and Straus et al. reported as 0.94; from $r = 0.31$ ($p < 0.001$) to $r = 0.87$ ($p < 0.001$), respectively. BNSS shows strong convergent validity; the correlation coefficients of BNSS total score with PANSS-negative subscale, SANS- and BPRS-negative symptoms subscale were reported as $r = 0.80$ ($p < 0.001$), $r = 0.80$ ($p < 0.001$), $r = 0.86$ ($p < 0.001$), respectively. In the discriminant validity analyses, BNSS total score was not correlated with PANSS-positive symptoms subscale ($r = 0.09$), BPRS-positive domain ($r = -0.06$) or disorganised domain ($r = 0.04$) but moderately correlated with PANSS general psychopathology ($r = 0.40$, $p < 0.001$), PANSS total score ($r = 0.58$, $p < 0.001$) and BPRS total score ($r = 0.32$, $p < 0.01$). (Kirkpatrick et al. 2011; Strauss et al. 2012b).

The two-factor analytic studies showed similar results apart from the 'lack of distress' item. In the first psychometric study, Kirkpatrick et al. reported Factor 1 including the blunted affect and alogia subscales with eigenvalue of 7.35; Factor 2 including anhedonia, avolition and asociality subscales with eigenvalue of 1.82. 'Lack of distress' did not load on any of the factors (Kirkpatrick et al. 2011). However, in the subsequent study, this item loaded on Factor 1 together with the blunted affect and alogia items, named as 'emotional expressivity' with eigenvalue 7.53; Factor 2 remained with the same items, named as 'motivation and pleasure' with eigenvalue 1.40 (Strauss et al. 2012a).

BNSS has also been translated into several other languages, that is, Spanish, Italian and German. Validation studies for the Spanish version (Mané et al. 2014) and the Italian version (Mucci et al. 2014) are already completed and published whereas the German version is reported to be under review (Strauss et al. 2016).

Mentioning the statistical features of the Spanish version; the Cronbach's alpha was reported as 0.98; all of the items were significantly correlated with the total score and the ICC for BNSS total score was 0.97. For the convergent validity, BNSS total score was strongly correlated with SANS total score and PANSS-negative subscale; for the discriminant validity, BNSS total score was not significantly correlated with PANSS-positive and general psychopathology subscale but moderately correlated with PANSS total score (Mané et al. 2014).

In the Italian version of BNSS, Mucci et al. reported ICC as 0.98 for the total score. Focusing on the validation results of the Italian sample, the BNSS total score was found to be highly correlated with PANSS-negative subscale and moderately correlated with PANSS total score indicating a good convergent validity; in addition, BNSS total score showed weak correlations with PANSS-positive subscale and CDSS total score (Mucci et al. 2014).

Methods

Subjects

Participants were recruited from outpatient and inpatient units of both Ege and Istanbul University Hospitals' psychiatry departments. Inclusion criteria were meeting the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) (American Psychiatric Association 2000) diagnosis of schizophrenia through Structured Clinical Interview for DSM-IV Axis 1 Disorders Clinician Version (SCID-CV) (First et al. 1997) and being between 18–65 years of age. Patients with serious medical illnesses, neurological disorders including history of seizures, head trauma or any cerebrovascular accident, any movement disorders or severe mental retardation were excluded. A total of 75 patients were recruited to this study.

The Ethical Committee of Istanbul Faculty of Medicine approved the study protocol; the work was conducted according to Declaration of Helsinki. Patients gave informed consent and anonymity was preserved.

Measures

The patients were assessed using the BNSS-TR, PANSS, Calgary Depression Scale for Schizophrenia (CDSS) (Addington et al. 1993), and the Extrapyramidal Symptom Rating Scale (ESRS) (Chouinard & Margolese 2005). In order to assess the inter-rater reliability, BNSS-TR was administrated by a psychiatry resident who was trained by one of the developers of BNSS in one centre of the study, and by a professor of psychiatry in the other centre for a total of 10 patients. While the administrator did the interview, the other rater silently observed.

Brief negative symptom scale (BNSS)

BNSS is a 13-item scale, divided into six subscales that are as follows: anhedonia, distress, asociality, avolition, blunted affect and

alogia (Table 1). It includes a manual, score sheet and workbook. The manual defines the terms used in the scale, provides anchors for each item and gives instructions for a semistructured interview, including suggested questions. For each item, the workbook consists of probe questions to guide the interviewer along the subscales. The items are rated on a 7-point (0–6) scale, with anchor points generally ranging from the symptom's being absent (0) to severe (6). A scale total score is calculated by summing the 13 individual items, and thus, it ranges from 0 to 78. Similarly, subscale scores are calculated by summing the individual items within each subscale. The distress subscale has only one item, which quantifies the absence of distress, but this subscale is otherwise treated in the same manner as the other subscales.

BNSS-TR was developed using the translation-backtranslation method. The manual, score sheet and workbook were translated into Turkish by the psychiatry resident who was trained by one of the developers of the original scale. They were then backtranslated into English by another psychiatry resident. The backtranslated version was reviewed and edited by Gregory Strauss, one of the original developers of the scale. The edited parts went under the same process and the final version was approved by the developers.

PANSS

The PANSS was administered for use in the concurrent, convergent and divergent validity analyses. The scale includes seven positive symptom items (delusions, conceptual disorganisation, hallucinatory behaviour, excitement, grandiosity, suspiciousness, hostility), seven negative symptom items (blunted affect, emotional withdrawal, poor rapport, passive-apathetic social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation, stereotyped thinking) and 16 general psychopathology items (somatic concern, anxiety, guilt feelings, tension, mannerisms and posturing, depression, motor retardation, uncooperativeness, unusual thought content, disorientation, poor attention, lack of judgment and insight, disturbance of volition, poor impulse control, preoccupation, active social avoidance). All 30 items are rated on a 7-point symptom severity scale, ranking from 1 (absent) to 7 (extremely severe). The PANSS score is calculated by summation of the item ratings to yield positive, negative and general psychopathology subscale scores and the total score. PANSS, had already been translated to Turkish and validated (Kostakoglu et al. 1999).

CDSS

The CDSS was administered to assess depressive symptoms for use in concurrent and divergent validity. The CDSS includes nine items (depression, hopelessness, self-depreciation, guilty ideas of reference, pathological guilt, morning depression, early wakening, suicide, observed depression), each rated from 0 (absent) to 3 (severe). Turkish translation and validation of CDSS has already been completed (Aydemir et al. 2000).

Table 1. Subscales and items of the BNSS.

Anhedonia
1. Intensity of pleasure during activities
2. Frequency of pleasurable activities
3. Intensity of expected pleasure from future activities **lack of normal distress**
4. Lack of normal distress
Asociality
5. Asociality: behaviour
6. Asociality: internal experience
Avolition
7. Avolition: behaviour
8. Avolition: internal experience
Blunted affect
9. Facial expression
10. Vocal expression
11. Expressive gestures
Alogia
12. Quantity of speech
13. Spontanious elaboration

ESRS

The ESRS was administered to assess extrapyramidal symptoms for use in concurrent and divergent validity. The ESRS is designed to assess frequency and severity of Parkinsonism, dyskinesia, akathisia and dystonia. Ratings are made through a combination of a clinical interview, as well as a motor examination. (Chouinard & Margolese 2005).

Statistical analyses

In the reliability analyses, Cronbach's alpha coefficients for the total scale and for the subscales, Pearson item-scale correlations, and intraclass correlation coefficients were calculated. In addition, for reliability analysis, inter-rater correlation with Pearson's correlation test was calculated where one author was interviewer and the other was observer.

In validity analyses, structural validity was evaluated with principal component analysis (PCA) with direct oblimin rotation. Factors with eigenvalue greater than 1 and items with factor loadings greater than 0.4 were taken into consideration.

Total scale scores and subscale scores were correlated with PANSS and its subscales, CDSS and ESRS for concurrent validity. For convergent validity PANSS-negative symptoms subscale, and for divergent validity, PANSS-positive and general psychopathology subscales, CDSS and ESRS were considered.

Statistical Package for the Social Sciences (SPSS, version 20, Chicago, IL; Nie et al., 2011) was used for all the statistical analyses.

Results

The mean age of the patients was 34.6 ± 8.3 years and 76% ($n = 57$) were male. The mean duration of illness was 11.2 ± 7.5 years, and the mean number of previous hospitalisations was 1.3 ± 1.4. Demographic and clinical features of the study group are demonstrated in Table 2.

Reliability analyses

The Cronbach's alpha coefficient for internal consistency was calculated to be 0.96, and between 0.874–0.912; and for the subscales, the values were as follows: anhedonia 0.946, asociality 0.875, avolition 0.943, blunted affect 0.945, alogia 0.956. Since 'lack of distress' item is only one question, no internal consistency calculation was done. The item-total score correlation coefficients were found to be between 0.655–0.884 (Table 3), and the subscale-total score correlation coefficients were between 0.654–0.853. The intraclass correlation coefficient was 0.665 ($p < 0.0001$). In inter-rater reliability, the correlation between the two ratings, was high ($r = 0.982$, $p < 0.0001$).

Validity analyses

In the validity analyses, exploratory factor analysis was performed as PCA with direct oblimin rotation. First, the sampling adequacy was assessed with Keiser–Meyer–Olkin measure and it was found to be 0.91. Then, in exploratory factor analysis, two factors with

eigenvalues greater than 1 were obtained and they represented 78.9% of the total variance (Table 3). All items were included in a factor with a factor loading of greater than 0.4. For Factor 1, which is consisted of items 1, 2, 3, 5, 6, 7 and 8 the eigenvalue was found to be 9.024 and for Factor 2, consisting of 4, 9, 10, 11, 12 and 13, the eigenvalue was 1.241. The first factor represents the 'motivation and pleasure' domain and it has a Cronbach alpha coefficient of 0.955. The second factor is related to the 'emotional expressivity' domain with a Cronbach alpha coefficient of 0.942.

The total mean score of the scale was significantly correlated with PANSS total score ($r = 0.693$, $p < 0.0001$), PANSS-positive symptoms subscale ($r = 0.285$, $p = 0.013$), negative symptoms subscale ($r = 0.845$, $p < 0.0001$) and general psychopathology subscale ($r = 0.383$, $p = 0.001$). However, CDSS ($r = -0.013$, $p = 0.910$) and ESRS ($r = 0.217$, $p = 0.061$) were not significantly correlated with the total score of the BNSS-TR (Table 4).

Discussion

In this two-centre study, we examined the inter-rater reliability, internal consistency and the construct validity of the BNSS-TR. Our results demonstrate a significant internal consistency with the Cronbach's alpha coefficient of 0.96 and it is similar to 0.93 and 0.94, which the developers of the original scale calculated (Kirkpatrick et al. 2011; Strauss et al. 2012b); 0.98 in the Spanish version (Mané et al. 2014). Looking at each item individually, the Cronbach's alpha values were still in satisfactory range (between 0.874 and 0.912) meaning that all the items were highly correlated with the total scale. Item-total score correlation coefficients were similar to the original and the Spanish versions as well. The intra-class correlation and the correlation of the inter-rater reliability were statistically significant.

The construct validity of BNSS-TR was examined by its relationship to widely-used standardised tools such as PANSS, CDSS and ESRS. The convergent validity of BNSS-TR is supported by the strong correlation with PANSS-negative symptoms subscale and moderate correlation with PANSS total score. The original version, the Spanish and Italian versions reported similar correlation results as mentioned in the objective section. The discriminant validity of BNSS-TR on the other hand, showed low correlations with PANSS-positive symptoms subscale and the general psychopathology subscale, which can be considered as a weak significance. Our results are similar to the original version and other translated versions. The developers of BNSS found no correlation between BNSS total score and PANSS-positive subscale but moderate correlations with general psychopathology subscale and total score; the Spanish version reported no correlation with PANSS-positive and general psychopathology subscales but a moderate correlation with the total score; the Italian version reported a weak correlation with PANSS-positive subscale. Together with these results, BNSS-TR can be accepted as an efficient tool to assess negative symptomatology and distinguish between negative and positive symptoms.

Our results confirmed a two-factor structure for BNSS-TR, including the same items as the original version of the scale. Factor 1, includes the seven items under anhedonia, asociality and avolition subscales with the eigenvalue of 9.024; in the original version with the eigenvalue of 1.40. Factor 2 includes lack of distress, items under blunted affect and alogia subscales with the eigenvalue of 1.241; in the original version, it had the eigenvalue of 7.53 (Strauss et al. 2012a). The 'lack of distress' item had a weaker loading in the factor structure similar to the original, the Spanish and the Italian versions.

Garcia-Portilla et al. constructed a study with two different analyses, using the Spanish version. The first two-factor structured analysis results were similar to the original scale except in the original version, item 8 (avolition-internal experience) was on the other factor. Moreover, here, authors did an additional factor analysis; based on their idea of alogia belonging to a different dimension, they created a third factor and performed the additional analysis with three components named as 'Component 1: External World',

Table 2. Demographic and clinical features of the study group.

Age (years)	34.6 ± 8.3
Gender	
Male	$n = 57$ 76.0%
Female	$n = 8$ 24.0%
Education (years)	12.0 ± 3.1
Substance use disorder	$n = 2$ 2.7%
Previous suicide attempts	$n = 9$ 12.0%
Duration of illness (years)	11.2 ± 7.5
Number of hospitalisations	7.8 ± 7.1
BNSS	29.4 ± 17.6
Anhedonia	7.5 ± 4.7
Distress	1.3 ± 1.6
Asociality	4.5 ± 2.7
Avolition	4.6 ± 3.0
Blunted affect	7.8 ± 4.8
Alogia	3.8 ± 3.5
PANSS total	53.0 ± 14.0
PANSS positive	10.0 ± 3.3
PANSS negative	16.2 ± 7.0
PANSS general psychopathology	26.6 ± 7.3
CDSS	2.5 ± 3.8
ESRS	4.9 ± 5.2

BNSS: Brief Negative Symptom Scale; PANSS: Positive and Negative Symptom Scale; CDSS: Calgary Depression Scale for Schizophrenia; ESRS: Extrapyramidal Symptom Rating Scale.

Table 3. Factor structure and item-total score correlation coefficients of BNSS.

Items	Factor 1	Factor 2	Communalities	Item-total score correlation coefficient	Cronbach alpha if item deleted
Item 1	0.853	−0.081	0.832	0.836	0.959
Item 2	0.929	0.017	0.840	0.811	0.959
Item 3	0.748	−0.231	0.858	0.884	0.957
Item 4	0.234	−0.520	0.498	0.655	0.963
Item 5	0.865	0.56	0.682	0.709	0.962
Item 6	0.972	0.144	0.767	0.728	0.961
Item 7	0.722	−0.200	0.767	0.821	0.959
Item 8	0.706	−0.264	0.832	0.872	0.958
Item 9	0.014	−0.890	0.809	0.804	0.960
Item 10	−0.051	−0.981	0.893	0.830	0.959
Item 11	−0.026	−0.939	0.848	0.813	0.959
Item 12	0.026	−0.863	0.777	0.789	0.960
Item 13	0.050	−0.891	0.861	0.845	0.959
Eigenvalue	9.024	1.241			
Variance (%)	69.4	9.5			

Table 4. Correlation coefficients of BNSS and its subscales with PANSS and its subscales, CDSS and ESRS.

BNSS	PANSS total	PANSS positive	PANSS negative	PANSS general psychopathology	CDSS	ESRS
Total score	0.693	0.285	0.845	0.383	−0.013	0.217
	$p = 0.001$	$p = 0.013$	$p = 0.001$	$p = 0.001$	$p = 0.910$	$p = 0.061$
Anhedonia	0.687	0.306	0.775	0.431	0.036	0.117
	$p = 0.001$	$p = 0.008$	$p = 0.001$	$p = 0.001$	$p = 0.761$	$p = 0.319$
Distress	0.496	0.047	0.749	0.200	−0.219	0.174
	$p = 0.001$	$p = 0.687$	$p = 0.001$	$p = 0.085$	$p = 0.059$	$p = 0.136$
Asocial	0.438	0.269	0.561	0.182	−0.089	−0.029
	$p = 0.001$	$p = 0.020$	$p = 0.001$	$p = 0.118$	$p = 0.449$	$p = 0.805$
Avolition	0.686	0.348	0.740	0.445	0.155	0.156
	$p = 0.001$	$p = 0.002$	$p = 0.001$	$p = 0.001$	$p = 0.183$	$p = 0.182$
Blunted affect	0.656	0.221	0.784	0.400	−0.017	0.407
	$p = 0.001$	$p = 0.057$	$p = 0.001$	$p = 0.001$	$p = 0.886$	$p = 0.001$
Alogia	0.513	0.130	0.773	0.176	−0.070	0.226
	$p = 0.001$	$p = 0.268$	$p = 0.001$	$p = 0.131$	$p = 0.549$	$p = 0.052$

BNSS: Brief Negative Symptom Scale; PANSS: Positive and Negative Symptom Scale; CDSS: Calgary Depression Scale for Schizophrenia; ESRS: Extrapyramidal Symptom Rating Scale.

'Component 2: Inner World' and 'Component 3: Alogia'. As a result of three-component structure; items 1, 2, 3, 5, 6 belonged to the 'external world' factor; items 7, 8, 9, 10, 11, belonged to the 'inner world' factor and items 12, 13 belonged to the 'alogia' factor. In this Spanish version, item 4 (lack of distress) was not included under any of the factors with regard to its weak loadings of 0.377 in the three-factored structure and 0.357 in the two-factored structure. (Garcia-Portilla et al. 2015).

The Italian version demonstrated almost the similar factor structure with the original version except the 'lack of distress' item. The authors named the first factor as 'avolition' and included items 1, 2, 3, 4, 5, 6, 7, 8; the second factor as 'poor emotional expression' and included items 9, 10, 11, 12, 13. Despite 'distress' not meeting the loading criterion of 0.70, with 0.61, it was concluded to have a high load on 'avolition' factor; rather than being on the second factor with 0.48 (Mucci et al. 2014). In the original article, Strauss et al. listed the 'lack of normal distress' under the 'emotional expressivity' factor with 0.51 loading (Strauss et al. 2012a).

Although BNSS was not primarily designed for the identification of primary or secondary negative symptoms, the non-significant correlations of BNSS-TR with both CDSS and ESRS support the fact that BNSS-TR has an additional strength in distinguishing primary negative symptoms from secondary causes. This distinction is important in determining the patients' functioning and prognosis (Kirkpatrick et al. 2001).

Depression is a substantial cause for loss of pleasure in schizophrenia patients regardless of their psychotic symptoms where anhedonia should be considered as a secondary negative symptom (Siris 2000). Recognition of primary anhedonia in this group of patients would be helpful in order to develop new treatments or non-pharmacological approaches such as psychotherapy for this purpose. It will also be important in distinguishing when to prescribe antidepressant agents with appropriate indication (Horan et al. 2006).

In addition, the extrapyramidal system side effects of antipsychotic medication such as bradymimia, bradykinesia, and rigidity may resemble blunt affect or cause decrease in gestures (Kelley et al. 1999). It is important for clinicians to recognise this side effect in order to organise patients' medications for the improvement of their quality of life and not to prejudge them as severely ill (Peralta et al. 2000).

Even though BNSS is not generated for the identification of deficit or non-deficit schizophrenia, the anhedonia and lack of distress scores may give the clinician an idea about the course of illness. As previously mentioned in objective, lack of distress item successfully differentiated deficit and non-deficit syndrome (Strauss et al. 2012b). Patients who are rated high on these two subscales could be further evaluated for the presence of primary and enduring negative symptoms. To further expand on our study, a subsequent study of convergent validity of BNSS-TR and the SDS would be helpful in order to measure the strength of the scale.

There are some limitations of our study. First, most of the participants were in a clinically stable state and were able to maintain their attention while administration of five scales for approximately 45–60 minutes. This might have limited the generalisation of our results for the diversity of negative symptoms in schizophrenia. The reliability and validity of the translated version could be studied with a group consisting of mostly inpatients or individuals with exacerbated symptoms.

Secondly, we did the inter-rater reliability with 10 cases, which may be considered low compared to the subsequent validation study of the original version the Spanish and the Italian versions (Strauss et al. 2012b; Mané et al. 2014; Mucci et al. 2014). In addition, the sample size was relatively small for carrying out PCA or CFA analyses. Reliability and validity studies with greater sample sizes would give information about the feasibility of BNSS-TR in large and multicentre studies.

One of the most important features of BNSS is assessing both one's observable behavioral pattern in their personal or social lives and their inner sense and attitudes (Kirkpatrick et al. 2011). Due to particular external reasons (lack of money, limited access to transportation, lack of social support, etc.), one might not have a chance to do an act but still give an importance to it. In these cases, commenting on this patient solely based on the presence or the absence of an act would lead the clinician to misjudge the condition of the patient.

Since the administration of BNSS-TR is mainly concerned with the present condition of the patients, it is difficult to know its strength in detecting changes in patients' clinical states. Long-term studies using BNSS-TR would clarify the ability to indicate changes and predict prognosis. Moreover, long-term follow-up studies of patients that proceed to chronic state (enduring negative symptoms more than 12 months) would support the contribution of BNSS to the discrimination of deficit versus non-deficit types.

In conclusion, considering the ease of application and coverage of all the negative symptoms defined in MATRICS Consensus and the satisfactory psychometric characteristics of the scale, BNSS-TR can be accepted as a useful instrument for the assessment of negative symptoms both in clinical practice and studies.

Key points

- BNSS is one of the new generated instruments for examining the negative symptoms in schizophrenia defined by

Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) Consensus.

- BNSS-TR shows correlation with PANSS-negative symptoms subscale and PANSS total score in convergent validity, and with PANSS-positive symptoms subscale and PANSS general psychopathology subscale in discriminant validity analyses. These results indicate that BNSS-TR is an efficient tool to assess negative symptomatology and distinguish between negative and positive symptoms.
- BNSS-TR demonstrates a two- factor structure, including the same items as the original version of the scale. Factor 1 includes the seven items under anhedonia, asociality and avolition subscales. Factor 2 includes lack of distress, items under blunted affect and alogia subscales The developers of BNSS named the first factor as 'motivation and pleasure' and the second factor as 'emotional expressivity'.
- BNSS assesses both one's observable behavioural pattern in their personal or social lives and their inner sense and attitudes, which enables the clinician to discard the impact of external reasons on the severity of symptoms but evaluate the course of illness itself.
- BNSS-TR can be considered as a useful scale for the assessment of negative symptoms.

Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

Funding

This study was supported by Scientific Research Projects Department of Istanbul University [project number: BYP-52056] and The Scientific and Technological Research Council of Turkey [project number: 113S008].

References

Addington D, Addington J, Maticka-Tyndale E. 1993. Assessing depression in schizophrenia: the Calgary depression scale. Br J Psychiatry. 163:39–44.

American Psychiatric Association. 2000. Diagnostic and statistical manual of mental disorders. 4th ed. Washington DC: American Psychiatric Association.

American Psychiatric Association. 2013. Diagnostic and statistical manual of mental disorders. 5th ed. New York: American Psychiatric Association.

Andreasen NC. 1982. Negative symptoms in schizophrenia. Definition and reliability. Arch Gen Psychiatry. 39:784–788.

Aydemir Ö, Esen Danacï A, Deveci A, İçelli İ. 2000. Reliability and validity of the Turkish version of Calgary depression scale for schizophrenia. Noropsikiyatri Ars. 37:82–86.

Chouinard G, Margolese HC. 2005. Manual for the extrapyramidal symptom rating scale (ESRS). Schizophr Res. 76:247–265.

First MB, Spitzer RL, Gibbon M, Williams JBW. 1997. Structured clinical interview for DSM-IV axis I disorders, Clinician version (SCID-CV) for DSM-IV 132. Washington, DC: American Psychiatric Press, Inc.

Galderisi S, Bucci P, Mucci A, Kirkpatrick B, Pini S, Rossi A, Vita A, Maj M. 2013. Categorical and dimensional approaches to negative symptoms of schizophrenia: focus on long-term stability and functional outcome. Schizophr Res. 147:157–162.

Garcia-Portilla MP, Garcia-Alvarez L, Mané A, Garcia-Rizo C, Sugranyes G, Bergé D, Bernardo M, Fernández-Egea E, Bobes J. 2015. The negative syndrome of schizophrenia: three underlying components are better than two. Schizophr Res. 166:2013–2016.

Horan WP, Kring AM, Blanchard JJ. 2006. Anhedonia in schizophrenia: a review of assessment strategies. Schizophr Bull. 32: 259–273.

Kay SR, Fiszbein A, Opler L. 1987. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull. 13: 261–276.

Kelley ME, Van Kammen DP, Allen DN. 1999. Empirical validation of primary negative symptoms: independence from effects of medication and psychosis. Am J Psychiatry. 156:406–411.

Kirkpatrick B, Buchanan RW, McKenney PD, Alphs LD, Carpenter WT. 1989. The schedule for the deficit syndrome: an instrument for research in schizophrenia. Psychiatry Res. 30:119–123.

Kirkpatrick B, Buchanan RW, Ross DE, Carpenter WT. 2001. A separate disease within the syndrome of schizophrenia. Arch Gen Psychiatry. 58:165–171.

Kirkpatrick B, Fenton WS, Carpenter WT, Marder SR. 2006. The NIMH-MATRICS consensus statement on negative symptoms. Schizophr Bull. 32:214–219.

Kirkpatrick B, Strauss GP, Nguyen L, Fischer BA, Daniel DG, Cienfuegos A, Marder SR. 2011. The brief negative symptom scale: psychometric properties. Schizophr Bull. 37:300–305.

Kostakoglu E, Batur S, Tiryaki A, Gogus A. 1999. Validity and reliability of Turkish version of the positive and negative syndrome scale (PANSS) for schizophrenia. Turk Psikol Derg. 14:23–32.

Kring AM, Gur RE, Blanchard JJ, Horan WP, Reise SP. 2013. The clinical assessment interview for negative symptoms (CAINS): final development and validation. Am J Psychiatry. 170:165–172.

Mané A, Garcia-Rizo C, Garcia-Portilla MP, Bergé D, Sugranyes G, Garcia-Alvarez L, Bernardo M, Bobes J, Fernandez-Egea E. 2014. Spanish adaptation and validation of the brief negative symptoms scale. Compr Psychiatry. 55:1726–1729.

Marder SR, Kirkpatrick B. 2014. Defining and measuring negative symptoms of schizophrenia in clinical trials. Eur Neuropsychopharmacol. 24:737–743.

Mucci A, Galderisi S, Merlotti E, Rossi A, Rocca P, Bucci P, Piegari G, Chieffi M, Vignapiano A, Maj M. 2014. The brief negative symptom scale (BNSS): independent validation in a large sample of Italian patients with schizophrenia. Eur Psychiatry. 30:641–647.

Nie N, Hull C, Bent D. 2011. IBM statistical package for the social sciences (SPSS Version 20). Computer Software. Chicago, IL: SPSS.

Peralta V, Cuesta MJ, Martinez-Larrea A, Serrano JF. 2000. Differentiating primary from secondary negative symptoms in schizophrenia: a study of neuroleptic-naive patients before and after treatment. Am J Psychiatry. 157:1461–1466.

Raskin A, Pelchat R, Sood R, et al. 1993. Negative symptom assessment of chronic schizophrenia patients. Schizophr Bull. 19: 627–635.

Siris SG. 2000. Depression in schizophrenia: perspective in the era of ''antipsychotic agents'' antipsychotic. Am J Psychiatry. 157: 1379–1389.

Strauss GP, Gold JM. 2012. A new perspective on anhedonia in schizophrenia. Am J Psychiatry. 169:364–373.

Strauss GP, Hong LE, Gold JM, Buchanan RW, McMahon RP, Keller WR, Fischer BA, Catalano LT, Culbreth AJ, Carpenter WT, Kirkpatrick B. 2012a. Factor structure of the brief negative symptom scale. Schizophr Res. 142:96–98.

Strauss GP, Keller WR, Buchanan RW, Gold JM, Fischer BA McMahon RP, Catalano LT, Culbreth AJ, Carpenter WT,

Kirkpatrick B. 2012b. Next-generation negative symptom assessment for clinical trials: validation of the brief negative symptom scale. Schizophr Res. 142:88–92.

Strauss GP, Vertinski M, Vogel SJ, Ringdahl EN, Allen DN. 2016. Negative symptoms in bipolar disorder and schizophrenia: a psychometric evaluation of the brief negative symptom scale across diagnostic categories. Schizophr Res. 170:285–289.

World Health Organization. 1992. ICD-10 International statistical classification of diseases and health related problems. Geneva: World Health Organization.