The Brief Symptom Inventory: A validity-reliability Study of a Sample from Azerbaijan

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Abstract
The aim of this research was to adapt Brief Symptom Inventory developed by Derogatis (1983) into Azerbaijani language. Data were collected from 309 college students to determine psychometric properties of inventory. Samples in the study have been selected separately. The package programs of SPSS 18.0 and Lisrel 8.80 were used for the analysis of the data. The Cronbach’s Alpha (α) internal consistency coefficient was calculated for the scale (α=.95) and for each subscale: Somatization (α = .80), Obsessive-Compulsive (α = .70), Interpersonal Sensitivity (α = .65), Depression (α = .81), Anxiety (α = .82), Hostility (α = .81), Phobic anxiety (α = .60), Paranoid ideation (α = .61) and Psychoticism (α = .65). The 9 factor structure of the inventory was tested through CFA.

Keywords: brief symptom inventory, Azerbaijani culture, reliability, validity

1. Introduction
According to official data of Azerbaijan’s State Statistics Committee, the country’s youth population in the 14-29 age groups account for slightly over 2.6 million people or 28% of Azerbaijan’s population (www.stat.gov.az). There has been an upward trend in the growth of neurological disorders among this group of population compared to previous years. It is considered that the war with Armenia and its implications, including internal displacement of the population and economic difficulties continue to impact the youth population. This has given rise to a need for tests and inventories that could be rapidly administered to evaluate the psychological symptoms among them. This study tests the validity and reliability of the Brief Symptom Inventory as an instrument that has been translated and adapted into many languages.

Recently, the importance of assessment of individuals with reliable and valid scales has increased in mental health. The self-reporting scales are specified as time saving, useful, practical and supportive in defining preventive approaches. Brief Symptom Inventory (BSI) is a self-reporting scale, which measures nine psychological symptoms. BSI allows screening several psychological symptoms in a short time span. Therefore, it is used extensively in clinical evaluation and research. According to Medline, BSI has been employed in 260 studies since 2000. As Psycho info cited, this inventory is used in 1700 studies (Maanse Hoe & John S. Brekke, 2008).

The BSI has been translated and adapted for different cultures, including into British (Francis, Rajan, & Turner, 1990; Ryan, 2007), Italian (De Leo, Frisoni, Rozzini, & Trabucchi, 1993), Turkish (Shahin & Durak, 1994), Spanish (Aragón, Bragado, & Carrasco, 2000; Ruipérez, Ibáñez, Lorente, Moro,Ortet, 2001; Pereda et al., 2007), Israeli (Canetti, Shalev, & Kaplan, 1994; Gilbar, & BenZur, 2002), Scottish (Schwannauer & Chetwynd, 2007), Greek (Louitiou-Ladd, Panayiotou& Kokkinos) and Persian (P. Mohammadkhani, 2010), and used as a tool of valid and reliable measurement.

The translation and adaptation of BSI into Azerbaijani culture is important as a tool of data collection for field experts and for facilitating new research options. Moreover, as a country that has been affected by a war with Armenia and millions of refugees, Azerbaijan needs to analyze psychological problems among its population and preventive methods. Therefore, the aim of the study is to adapt easily defined and practical BSI scale for the evaluation of general distress among young peoples.

In this article, the authors report on the psychometric properties and dimensional structure of BSI Azerbaijani version.
2. Method

2.1 Sample

Data collected from the Khazar University in Azerbaijan for academic year 2014-2015. The sample of the study consists of 309 university students, who were recruited by random cluster sampling. Participants ranging in age from 17 to 28 years old (M=19.64; SD=1.73) were included in the study. Out of 309 participants men consist of (N=104) 37.7%, women (N=205) 66.3%.

2.2 Data Collection Tools

In order to obtain the demographic data on the participants, the authors developed “Personal Information Questionnaire”.

2.3 Brief Symptom Inventory

The BSI, a short form of the Symptom Checklist-90 (Derogatis, 1977), is a 53-item self-report measure of symptoms of psychological distress (Derogatis, 1993). The BSI is prevalent in the studies among adults. The instrument consists of 9 subscales (‘Somatisation’, ‘Obsessive–Compulsive’, ‘Interpersonal Sensitivity’, ‘Depression’, ‘Anxiety’, ‘Hostility’, ‘Phobic Anxiety’, ‘Paranoid Ideation’ and ‘Psychoticism’) and 3 global indices (General Severity Index (GSI), the Positive Symptom Distress Index (PSDI) and the Positive Symptom Total (PST)). The items consist of physical and psychological symptoms that occurred during the last week (Derogatis and Melisaratos, 1983). The BSI is a Likert-type scale, which rates items on a 5-point system of distress (0–4), ranging from ‘not at all’ to ‘extremely’.

Three different studies show that the internal consistency coefficient of 9 subscales ranged from .71 to .85. Correlation coefficients as a result of the test retest reliability study ranged as follows: .68-.91 for the 9 subscale, .90 for the GSI, .87 for the PSDI, and .80 for the PST (Derogatis & Spencer, 1982, Şahin & Durak, 1994).

3. Procedure

3.1 Translation

The original scale was translated into the Azerbaijani language by two bilinguals, of both Azerbaijani and English languages, as experts of psychologists. Then, the translated scale was administered on 25 students from various departments and revised based on feedback from the individuals, to complete the process.

3.2 Data Analysis for CFA

First correlations among the BSI scales were computed as Cronbach alpha coefficients for the full global severity index and each of its nine subscales to examine the internal reliability of the scale. The goodness-of-fit indices for the model tested through CFA was determined with the help of $\chi^2$ (Chi-Square Goodness-of-Fit), GFI (Goodness-of-Fit Index), AGFI (Adjusted Goodness-of-Fit Index), CFI (Comparative Fit Index), NFI (Normed Fit Index), NNFI (Not-Normed Fit Index), RMR (Root Mean Square Residuals), SRMR (Standardized Root Mean Square Residuals) and RMSEA (Root Mean Square Error of Approximation) indices. For the analysis of the data, the package programs of SPSS 18.0 and Lisrel 8.80 (Jöreskog & Sörbom, 2006) were used for descriptive statistics and confirmatory factor analysis, respectively.

4. Findings

4.1 Findings Regarding the Adaptation of Brief Symptom Inventory

Table 1. Means(M) and standard deviations(SD) by gender for the Azerbaijani version of the BSI

<table>
<thead>
<tr>
<th>Scale</th>
<th>Total (N=309)</th>
<th>Male (N=104, 33.7%)</th>
<th>Female (N=205, 66.3%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>SOM</td>
<td>1.28</td>
<td>.65</td>
<td>0.80</td>
</tr>
<tr>
<td>OCB</td>
<td>1.55</td>
<td>.78</td>
<td>1.48</td>
</tr>
<tr>
<td>I-S</td>
<td>1.44</td>
<td>.94</td>
<td>1.30</td>
</tr>
<tr>
<td>DEP</td>
<td>1.31</td>
<td>.90</td>
<td>1.30</td>
</tr>
<tr>
<td>ANX</td>
<td>.96</td>
<td>.76</td>
<td>1.39</td>
</tr>
<tr>
<td>HOS</td>
<td>1.50</td>
<td>.94</td>
<td>1.33</td>
</tr>
<tr>
<td>PHOB</td>
<td>1.45</td>
<td>.99</td>
<td>0.88</td>
</tr>
<tr>
<td>PAR</td>
<td>.87</td>
<td>.70</td>
<td>1.46</td>
</tr>
<tr>
<td>PSY</td>
<td>1.55</td>
<td>.83</td>
<td>1.22</td>
</tr>
<tr>
<td>GSI</td>
<td>1.20</td>
<td>.77</td>
<td>1.20</td>
</tr>
</tbody>
</table>

P < .05  ns
Table 2. Mean scores on the BSI in different studies

<table>
<thead>
<tr>
<th>Subscales</th>
<th>British (N=376)</th>
<th>Scottish (N=459)</th>
<th>Greek (N=818)</th>
<th>Israeli (N=510)</th>
<th>Iranian (N=354)</th>
<th>Psychiatric Outpatients (N=1002)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Community sample</td>
<td>Psychologist sample</td>
<td>Community sample</td>
<td>Community sample</td>
<td>Depressed patients</td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>1.09 (.94)</td>
<td>1.34 (.83)</td>
<td>.62 (.68)</td>
<td>1.34 (.94)</td>
<td>.83 (.79)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.43 (0.57)</td>
<td>0.77 (.79)</td>
<td>0.62 (.68)</td>
<td>1.34 (.94)</td>
<td>.83 (.79)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.59 (0.63)</td>
<td>0.94 (.79)</td>
<td>1.70 (.85)</td>
<td>1.57 (1.00)</td>
<td>1.57 (1.00)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.58 (0.72)</td>
<td>1.12 (.90)</td>
<td>.68 (.71)</td>
<td>1.53 (.96)</td>
<td>1.58 (1.05)</td>
<td></td>
</tr>
<tr>
<td>Somatization</td>
<td>0.77 (.79)</td>
<td>1.12 (.90)</td>
<td>.68 (.71)</td>
<td>1.53 (.96)</td>
<td>1.58 (1.05)</td>
<td></td>
</tr>
<tr>
<td>Obsessive-compulsive</td>
<td>1.69 (1.08)</td>
<td>1.75 (1.22)</td>
<td>1.12 (.90)</td>
<td>.68 (.71)</td>
<td>1.53 (.96)</td>
<td></td>
</tr>
<tr>
<td>Interpersonal sensitivity</td>
<td>1.09 (.94)</td>
<td>1.34 (.83)</td>
<td>.62 (.68)</td>
<td>1.34 (.94)</td>
<td>.83 (.79)</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td>0.42 (0.65)</td>
<td>0.92 (0.81)</td>
<td>.70 (.69)</td>
<td>1.83 (1.01)</td>
<td>1.80 (1.08)</td>
<td></td>
</tr>
<tr>
<td>Anxiety</td>
<td>0.45 (0.60)</td>
<td>1.06 (0.85)</td>
<td>.85 (.71)</td>
<td>1.42 (.91)</td>
<td>1.70 (1.00)</td>
<td></td>
</tr>
<tr>
<td>Hostility</td>
<td>0.44 (0.60)</td>
<td>0.93 (.78)</td>
<td>.72 (.70)</td>
<td>1.18 (.84)</td>
<td>1.16 (0.93)</td>
<td></td>
</tr>
<tr>
<td>Phobic anxiety</td>
<td>0.24 (0.50)</td>
<td>0.53 (.64)</td>
<td>.46 (.61)</td>
<td>.90 (.78)</td>
<td>.86 (0.88)</td>
<td></td>
</tr>
<tr>
<td>Paranoid ideation</td>
<td>0.54 (0.65)</td>
<td>1.14 (.83)</td>
<td>.91 (.78)</td>
<td>1.52 (.92)</td>
<td>1.14 (0.95)</td>
<td></td>
</tr>
<tr>
<td>Psychotism</td>
<td>1.27 (0.98)</td>
<td>.72 (.70)</td>
<td>.57 (.62)</td>
<td>1.37 (0.84)</td>
<td>1.19 (0.87)</td>
<td></td>
</tr>
<tr>
<td>GSI</td>
<td>1.47 (0.85)</td>
<td>.94 (0.65)</td>
<td>.72 (.59)</td>
<td>1.32 (.70)</td>
<td>1.32 (0.72)</td>
<td></td>
</tr>
<tr>
<td>M (SD)</td>
<td>0.44 (0.47)</td>
<td>1.47 (0.85)</td>
<td>.94 (0.65)</td>
<td>1.32 (0.70)</td>
<td>1.32 (0.72)</td>
<td></td>
</tr>
</tbody>
</table>

Descriptive statistics of participants are presented in Table 1. Out of 309 participants 37.7% (N=105) were male and 66.3% were female (N=204). The differences between the men and women were evaluated with a series of Independent Samples t Tests. Except for the “Somatisation” subscale, none of the differences between male and female respondents were significant at the level of p < .05. As can be seen from the Table 1 and Table 2, mean scores were found to be higher than in other countries, especially for community samples.

Table 3. Pearson Correlations Coefficients among the nine subscales and GSI

<table>
<thead>
<tr>
<th>Scales</th>
<th>SOM</th>
<th>OC</th>
<th>IS</th>
<th>DEP</th>
<th>ANX</th>
<th>HOS</th>
<th>PHOB</th>
<th>PAR</th>
<th>PSY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOM</td>
<td>-</td>
<td>-.57</td>
<td>.56</td>
<td>.53</td>
<td>.71</td>
<td>.55</td>
<td>.61</td>
<td>.46</td>
<td>.51</td>
</tr>
<tr>
<td>OC</td>
<td>.57</td>
<td>-</td>
<td>.56</td>
<td>.63</td>
<td>.66</td>
<td>.53</td>
<td>.55</td>
<td>.55</td>
<td>.58</td>
</tr>
<tr>
<td>IS</td>
<td>.46</td>
<td>.56</td>
<td>-</td>
<td>.68</td>
<td>.67</td>
<td>.48</td>
<td>.55</td>
<td>.63</td>
<td>.61</td>
</tr>
<tr>
<td>DEP</td>
<td>.53</td>
<td>.63</td>
<td>.68</td>
<td>-</td>
<td>.74</td>
<td>.57</td>
<td>.62</td>
<td>.63</td>
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</tr>
<tr>
<td>ANX</td>
<td>.71</td>
<td>.66</td>
<td>.67</td>
<td>.74</td>
<td>-</td>
<td>.66</td>
<td>.70</td>
<td>.65</td>
<td>.66</td>
</tr>
<tr>
<td>HOS</td>
<td>.55</td>
<td>.53</td>
<td>.48</td>
<td>.57</td>
<td>.65</td>
<td>-</td>
<td>.50</td>
<td>.56</td>
<td>.55</td>
</tr>
<tr>
<td>PHOB</td>
<td>.61</td>
<td>.55</td>
<td>.55</td>
<td>.62</td>
<td>.70</td>
<td>.50</td>
<td>-</td>
<td>.57</td>
<td>.63</td>
</tr>
<tr>
<td>PAR</td>
<td>.46</td>
<td>.55</td>
<td>.63</td>
<td>.63</td>
<td>.65</td>
<td>.56</td>
<td>.57</td>
<td>-</td>
<td>.67</td>
</tr>
<tr>
<td>PSY</td>
<td>.51</td>
<td>.58</td>
<td>.61</td>
<td>.70</td>
<td>.66</td>
<td>.64</td>
<td>.63</td>
<td>.67</td>
<td>-</td>
</tr>
<tr>
<td>GSI</td>
<td>.64</td>
<td>.59</td>
<td>.63</td>
<td>.61</td>
<td>.68</td>
<td>.60</td>
<td>.56</td>
<td>.58</td>
<td>-</td>
</tr>
</tbody>
</table>

*p < .001

As presented in Table 3 correlations among the BSI sub-factors and Global Severity Index (GSI) were found to be significant at p < .001.

4.2 Internal consistency

Cronbach’s alpha internal consistency coefficient for the Global Severity Index (GSI) were identified as α = .95. Internal consistency for each subscale was calculated as follows: Somatization (α = .80), Obsessive-Compulsive (α = .70), Interpersonal Sensitivity (α = .65), Depression (α = .81), Anxiety (α = .82), Hostility (α = .81), Phobic anxiety (α = .60), Paranoid ideation (α = .61) and Psychoticism (α = .65).

4.3 Confirmatory Factor Analysis (CFA)

The BSI structure was made up of 53 and nine-factor items. As the data set demonstrated a normal distribution, the authors used parameter estimation method Maximum Likelihood Method and the data matrix Covariance Matrix in CFA.

The t-value for each indicator in the scale is suggested to be out of the range of +2.58 (p < .01). The t-value for each item was higher than +2.58. The error variance was lower than .90. Thus, the error variance was not much high (Kline, 2011; Raykov & Marcoulides, 2006; Tabachnick & Fidell, 2007).
The traditional measure for structural equation modeling is Chi-Square. First value to be examined is p level for the Chi-Square ($\chi^2$). An insignificant result at a 0.05 threshold shows good fit (Hooper et al. 2008). According to the results, p value is significant at 0.05 level. However, significant is normal for large sizes of samples. Therefore, it is suggested that other fit indices should be evaluated too (Tabachnick & Fidell, 2007). The Chi-Square value was found as $\chi^2 = 1930.52$ and degree of freedom as df= 952. It is perfect fit if the ratio of $\chi^2$/df (2.02) is lower than 3 (Kline, 2011; Tabachnick & Fidell, 2007).

When the fit statistic of Root Mean Square Error of Approximation (RMSEA) was analyzed, the fit index was found as .058. It shows good fit providing that RMSEA ≤ .08 (Hooper, et al. 2008). The goodness of fit index (GFI) was determined to be (.79) smaller than .90 which means poor fit (Hooper et al, 2008; Hu & Bentler, 1999). Root mean square residual (RMR) and standardized root mean square residual (SRMR) were found as: RMR=.080 and SRMR=.059. Suitability index values less than .05 were accepted as perfect fit and less than .08 good fit (Brown, 2006; Hu & Bentler, 1999). When examined, the Non-Normed Fit Index (NNFI) CFI (Comparative fit index), NNFI and CFI were found .97. Higher suitability values than .95 represent perfect fit (Hu & Bentler, 1999; Tabachnick & Fidell, 2007; Thompson, 2008).
As a result, perfect or good fit values were found for all fit indices except for the GFI. This indicates that the nine-dimensional structure of scale was confirmed.

5. Conclusion and Discussion

In this study, “Brief Symptom Inventory” developed by Derogatis (1993), was adapted into the Azerbaijani language. In this sense, instead of developing a new measure, it was considered expedient based on cultural and language similarities to use a measure with validity and reliability proven in many other studies. As this research project is the first and would be a pioneer for future studies, it is expected to significantly contribute, particularly to the national scholarly literature in psychology.

Students were randomly selected from different majors, through stratified sampling. Data were obtained from 309 students in the sample of the Khazar University.

The Cronbach’s Alpha (α) internal consistency coefficient of the scale was calculated as α= .95. Reliability coefficient of 9 sub-factors, regarding the scale, was found as follows: α=. 80 for Somatisation, α=.70 for Obsessive Compulsive, α=. 65 for Interpersonal Sensitivity, α=. 81 Depression, α=. 82, Anxiety, α=. 81, Hostility, α=. 60 for Phobic Anxiety, α=.61 for Paranoid Ideation. Additionally, the differences in gender attitudes in Somatisation subscale could have resulted from cultural manners. Based on these results, the scale structure is shown to be robust enough to be used in Azerbaijan.

The mean gained from subscales are higher than the community sample. (Francis, V. M., Rajan, P., & Turner, N. 1990) This results shows that from not everyone benefits the mental services and it is not widely spread.

The nine factor structure of the scale was tested through CFA. As a result of CFA, the fit indices were generally observed as good or perfect in 9 subscale BSI. Although international literature presents some findings on these factors, they may have different effect levels based on cultural differences. In this context, the BSI adapted within this study could be used as a diagnosis tool in clinical settings, despite the fact that required data was garnered from a university sample. Thus, investigating various demographic variables in different sample groups in Azerbaijan (presumably in clinical sample) and evaluating the results following this process would present data that are more robust. Another limitation of this study is the fact that data was collected from one university. Even though, the number of sample was enough, a more comprehensive study could be conducted in Azerbaijan to reveal the psychological distress among adults with more clarity. The focus of this research paper has been on developing a measurement tool tailored to Azerbaijan. Although, dearth lack of empirical studies in Azerbaijan prevented data collection from universities, introducing a measurement tool through this study will contribute to an increase in the scope of future empirical research in the country.

References


Derogatis, L. R., & Spencer, M. S. (1982). The Brief Symptom Inventory (BSI): Administration, scoring, and procedures manual-I. Baltimore, MD: Johns Hopkins University School of Medicine, Clinical Psychometrics Research Unit


Ramírez, N. A., Álvarez, M. C. B., & Galán, I. C. Fiabilidad Y Estructura Factorial Del «InventarioBreve De Síntomas» (Brief Symptom Inventory, Bsi) En Adultos


QISA SIMPTOM TESTİ (QST)
Aşağıda zaman zaman hırsızdan gürül bilan sxüntlar sıralanmışdır. Xahiş olunur hör birini
dıqatla oxuyun. Sonra bu vəziyyətin size bugün da daxil olmuş şərti ilə son 1 ay ərzində nə qədər
nahahat etdiyini qeyd edin.

1. Hırsılık, içinin titroması
2. Baş gicallanması və bayılma
3. Hər hansı bir insanın fikirinizi hakim olacağı hissi
4. Problemlərinizdə başqalarının günəşlandırmaq
5. Hadisələri yada salmaqda çətinlik
6. Asanlıq hərsənib özündən çıxmə
7. Sizə və əsrək hissəsindən ağır
8. Kучada və açqẓırazılardə qoxruq hissi
9. Hayatınıza son vərək fikirər
10. İnsanların çoxuna inanılmayacağı hissi
11. İştağımın pozulması
12. Həc bir səbəblə olməyanın qorxular
13. Nəzarət edə bilə minorityn özündən çıxmaçular (hirs partlayışları)
14. Başqalarıla birlikdə olanda belə təklik hiss ətmə
15. Görübəçək işləri ertələmə hissi
16. Yalqızlıq hissi
17. Özünü əfsiz, kodarlı hiss ətəmə
18. Həcən ilə maraqlanmaməq
19. Özünü kəvək hiss ətəmə
20. Asanlıq incima, dəyəmirşərlik
21. İnsanların size sevədəyin, əsə pisl davrandığına inanma
22. Özünü digər insanlardan əskin hiss ətəmə
23. Mədə ağrılər, ərək bulanma
24. Dəqəq insanların sizi izlədiyi yə da haqqınızda düşənləri hissi
25. Xəyy düzənədə qətənlik
26. Görüldüyünüz isə bir yə da bir neçə dəfə yoxlamaq
27. Qorar vera bilməmkən
28. Avtobus,qatar, mətro kimin qımyanı vasitələrinə minmə qorxusu
29. Qoşun almada çətinlik
30. Soyuq və istilik bazması
31. Sizi qorxudan müayıən davranış, yer və nəyalardan qazma hissi
32. Beyninizin bomboş qalması
33. Bəqəlikiniz bəzi yerlərin əynələnən hələ
34. Şəhərlərinə göc əzə verilməsi fikrə
35. Gəlaqəliklə alaqədar ümitəsilik duguləri
36. Düqəti endəşələrməkda çətinlik
37. Bədəniniz bəzi bölgələrinə zəiflik,gücəsizlik
38. Özünü gərgin və narahat hiss ətəmə
39. Olma və ölmə üzərində düşüncələr
40. Bir başqasını vurmaq, qorar vərmək,yaralamaq hissi
41. Ətraftəki nəzərli isə qərib, təkmə istəyi
42. Dəqəq insanların yanında ilən soň bir şey etməyə çıxışmaq
43. Çox insan olan mağanda narahatlıq hissi
44. Başqa insanlara həc yaxınlıq hiss etmə
45. Dəhşət və panika hissi
46. Təz-tez məbəhisəyə girmək
47. Tək qalanlar hırsılık hissi
48. Başqalarının sizi uğurlarına göc qiyamətəndirmələr
49. Özünü çox narahat hiss ətəmə
50. Dayərsizlik hissi
51. İçəzə vətəƏxəçəni təşələrə insanların sıxən istifadə edəcəyə fikrə
52. Qınəqəriq hissi
53. Ağrınma alaqədələr əsrəddüelər.

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