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 from309 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* (a = .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 (Louitsiou-Ladd, Panayiotu& 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 χ^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

Scale	Total (N=309)		Male (N=104, 33.7%)		Female (N=205, 66.3%)		P
	M	SD	M	SD	M	SD	
SOM	1.28	.65	0.80	.65	1.03	.79	< .05
OCB	1.55	.78	1.48	.78	1.57	.77	ns
I-S	1.44	.94	1.30	.87	1.51	.96	ns
DEP	1.31	.90	1.30	.84	1.32	.92	ns
ANX	.96	.76	1.39	.89	1.55	.95	ns
HOS	1.50	.94	1.33	.98	1.50	.99	ns
PHOB	1.45	.99	.88	.73	.86	.68	ns
PAR	.87	.70	1.46	.81	1.59	.84	ns
PSY	1.55	.83	1.22	.75	1.18	.78	ns
GSI	1.20	.77	1.20	0.60	1.32	0.67	ns

Table 2. Mean scores on the BSI in different studies

Subscales	British (N=376) community sample (Francis, Rajan& Turner, 1990) M (SD)	Scottish (N=459) psychologist sample (Schwannauer &Chetwynd, 2007) M (SD)	Greek (N=818) community sample (Loutsiou-Ladd, Panayıotou,& Kokkinos,2008) M (SD)	Israil(N=510) community sample (Gilbar&Ben-Z ur, 2002) M (SD)	Iranian (N=354) depressed patients (Mohammadkha ni, 2010) M (SD)	Psychiatric Outpatients (N=1002) (Derogatis& MelisaratoS, 1992) M (SD)
Somatization	0.43 (0.57)	1.09 (0.94)	0.77 (.79)	.62 (.68)	1.34 (.94)	.83 (.79)
Obsessive-compulsive	0.59 (0.63)	1.69 (1.08)	1.34 (.83)	.94 (.79)	1.70 (.85)	1.57 (1.00)
Interpersonal sensitivity	0.58 (0.72)	1.75 (1.22)	1.12 (.90)	.68 (.71)	1.53 (.96)	1.58 (1.05)
Depression	0.42 (0.65)	1.68 (1.14)	.92 (.81)	.70 (.69)	1.83 (1.01)	1.80 (1.08)
Anxiety	0.45 (0.60)	1.90 (1.13)	1.06 (.85)	.85 (.71)	1.42 (.91)	1.70 (1.00)
Hostility	0.44 (0.60)	1.30 (1.14)	.93 (.78)	.72 (.70)	1.18 (.84)	1.16 (.93)
Phobic anxiety	0.24 (0.50)	1.21 (1.16)	.53 (.64)	.46 (.61)	.90 (.78)	.86 (.88)
Paranoid ideation	0.54 (0.65)	1.29 (1.06)	1.14 (.83)	.91 (.78)	1.52 (.92)	1.14 (.95)
Psychotism	0.27 (0.48)	1.27 (0.98)	.72 (.70)	.57 (.62)	1.37 (.84)	1.19 (.87)
GSI	0.44 (0.47)	1.47 (0.85)	.94 (.65)	.72 (.59)	1.32 (.70)	1.32 (.72)

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

Scales	SOM	OC	IS	DEP	ANX	HOS	PHOB	PAR	PSY
SOM	-	.57	.56	.53	.71	.55	.61	.46	.51
OC	.57	-	.56	.63	.66	.53	.55	.55	.58
IS	.46	.56	-	.68	.67	.48	.55	.63	.61
DEP	.53	.63	.68	-	.74	.57	.62	.63	.70
ANX	.71	.66.	.67	.74	-	.66	.70	.65	.66
HOS	.55	.53	.48	.57	.65	-	.50	.56	.55
PHOB	.61	.55	.55	.62	.70	.50	-	.57	.63
PAR	.46	.55	.63	.63	.65	.56	.57	-	.67
PSY	.51	.58	.61	.70	.66	.54	.63	.67	-
GSI	.64	.59	.63	.61	.68	.59	.60	.56	.58

*p <.001

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

4.2 Internal Consistency

Cronbach's alpha internal consistency coefficient for the Global Severity Index (GSI) were identified asα = .95. Internal consistency coefficient for each subscale was calculated as follows: *Somatization* (α = .80), *Obsessive-Compulsive* (a = .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).
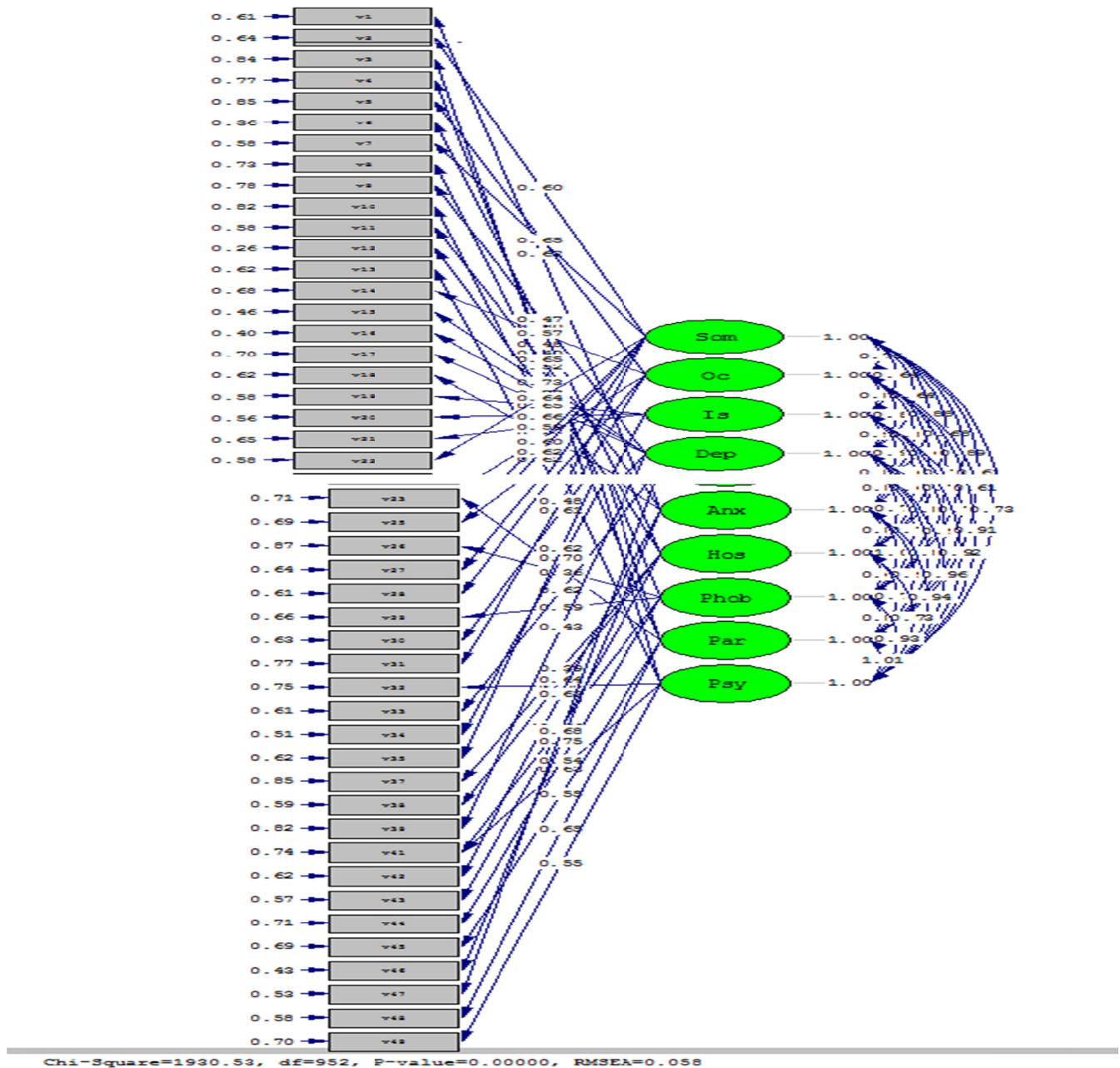
Figure 1. Standardized Path Diagram

The traditional measure for structural equation modeling is Chi-Square. First value to be examined is *p* level for the Chi-Square (χ^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 χ^2 = 1930.52 and degree of freedom as df= 952. It is perfect fit if the ratio of χ^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.

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QISA SİMPTOM TESTİ (QST)

	Heç	Ç ox az	Orta səviyyədə	Olduqca çox	Lap çox
Aşağıda zaman zaman hərkəsdə görülə bilən sıxıntılar sıralanmaşdır. Xahiş olunur hər birini diqqətlə oxuyun. Sonra bu vəziyyətin size bugün də daxil olmaq şərtiilə son 1 ay ərzində nə qədər narahat etdiyini qeyd edin.					

1. Hirslilik, içinin titrəməsi
2. Baş gicəllənməsi və bayılma
3. Hər hansı bir insanın fikirlərinizə hakim olacağı hissi
4. Problemlərinizdə başqalarını günahlandırmaq
5. Hadisələri yada salmaqda çətinlik
6. Asanlıqla hirslənib özündən çıxma
7. Sinə və ürək hissəsində ağrılar
8. Küçədə və açıq ərazilərdə qorxu hissi
9. Həyatınıza son vermə fikirləri
10. İnsanların çoxuna inanılmayacağı hissi
11. İştahanın pozulması
12. Heç bir səbəbi olmayanani qorxular
13. Nəzarət edə bilmədiyiniz özündən çıxmalar (hirs partlayışları)
14. Başqalarıyla birlikdə olanda belə təklik hiss etmə
15. Görüləcək işləri ertələmə hissi
16. Yalqızlıq hissi
17. Özünü kefsiz, kədərli hiss etmə
18. Heçnə ilə maraqlanmamaq
19. Özünü kövrək hiss etmə
20. Asanlıqla incimə, dəymədüşərlik
21. İnsanların size sevmədiyinə,sizə pis davrandığına inanma
22. Özünü digər insanlardan əksik hiss etmə
23. Mədə ağrıları, ürək bulanma
24. Digər insanların sizi izlədiyi ya da haqqınızda danışdığı hissi
25. Yuxuya getmədə çətinlik
26. Gördüyünüz işi bir ya da bir neçə dəfə yoxlamaq
27. Qərar verə bilməmək
28. Avtobus,qatar, metro kimi minik vasitələrinə minmə qorxusu
29. Nəfəs almada çətinlik
30. Soyuq və istilik basması
31. Sizi qorxudan müəyyən davranış,yer və əşyalardan qaçma hissi
32. Beyninizin bomboş qalması
33. Bədəninizin bəzi yerlərində iynələnmə halı
34. Səhvlərinizə görə cəza verilməsi fikri
35. Gələcəklə əlaqədar ümutsizlik duyguları
36. Diqqəti cəmləşdirməkdə çətinlik
37. Bədənin bəzi bölgələrində zəiflik,gücsüzlük
38. Özünü gərgin və narahat hiss etmə
39. Ölmə və ölüm üzərinə düşüncələr
40. Bir başqasını vurmaq,zərər vermək,yaralamaq hissi
41. Ətrafdaki nələri isə qırıb ,tökmə istəyi
42. Digər insanların yanında ikən səhv birşey etməməyə çalışmaq
43. Çox insan olan məkanda narahatçılıq hissi
44. Başqa insanlara heç yaxınlıq hiss etməmə
45. Dəhşət və panica hissi
46. Tez-tez mübahisəyə girmək
47. Tək qalandar hirslilik hissi
48. Başqalarının size uğurlarınıza görə qiymətləndirməmələri
49. Özünü çox narahat hiss etmə
50. Dəyərsizlik hissi
51. İcazə verəcəyiniz təqdirdə insanların sizdən istifadə edəcəyi fikri
52. Gunahkarlıq hissi
53. Ağlınızla əlaqədar tərəddüdlər.