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Psychometric assessment of beck scale for suicidal ideation (BSSI) in general population in Tehran

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Abstract

Background: Beck Scale for Suicidal Ideation (BSSI) is a widely used instrument to assess suicidality. However, there is only limited information about the psychometric characteristics of BSSI in the Persian language. In this study, we investigated the validity, reliability and factor structure of the BSSI in the general population of Tehran.

Methods: Initially, 900 questionnaire packages were distributed to the general population of Tehran (response rate: 59 percent), using cluster random sampling method. The questionnaire package consisted of a demographic questionnaire, the Persian translation of the BSSI, Symptom checklist-90-Revised (SCL-90-R), Beck Hopelessness Inventory (BHI) and Philips Social Support Appraisal Scale. Internal consistency and correlations of the BSSI scores with other constructs were investigated. Factor analysis was done using principal component method.

Results: The Cronbach's alpha coefficients of the screening part and the whole scale were satisfactory (>0.8). The scores of both the screening part and the total scale in individuals who experienced suicidal attempt were higher than others. Both the screening part and the total scale had a positive correlation with depression and Global Severity Index in SCL-90-R, and a negative correlation with social support. The scores of the screening part had a positive correlation with anxiety, psychoticism, hostility and hopelessness as well. The screening part consisted of a single factor which explains 60% of the total variance.

Conclusion: The Persian translation of the BSSI has desirable psychometric properties in research setting. However, the clinical usage of the scale remains to be explored, and the factor structure of the whole questionnaire should be assessed in a clinical sample.

Keywords: Suicidal Ideations, Psychometrics, Beck Scale for Suicidal Ideation, Factor Analysis.

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Introduction

According to the World Health Organization Suicide Prevention (SUPRE) Program, around one million people die due to suicide every year and this shows a worldwide mortality rate of 16 people per 100,000 or roughly one death every 40 seconds (1). According to the report of the Ministry of Health and Medical Education of the National Burden of Diseases and Injuries in Iran, the disability-adjusted life years (DALY) for suicide and self-injurious behaviors was 206.2 in 100,000 people in 2003 (2).

By definition, suicidal behaviors include suicidal ideation, planning, gestures and attempt (3). Suicidal ideation is defined as thoughts of harming or killing oneself (4). Suicidal ideation is one of the important factors of predicting suicide attempt and completed suicide and is considered as an index of the other mental health problems (5,6). Expressing the suicidal thoughts is not a protective factor, but it is consid-

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ered a risk factor for suicide attempts; as about 80% of people who attempt suicide have expressed such thoughts during the months before (7). However, fewer studies have been conducted on suicidal ideation compared to the studies conducted on completed suicide or suicide attempt (8).

In an international survey, in 1980s, the lifetime prevalence of suicidal ideation was estimated between 2.1% (in Beirut) to 18.5% in Christchurch, New Zealand (9). In this survey, the prevalence of lifetime suicidal attempt was estimated from 0.7% in Beirut to 5.9% in Puerto Rico. This survey showed that in spite of the homogenous prevalence of suicidal attempts all over the world, the prevalence of suicidal ideation varies in different countries.

In 2000, World Health Organization (WHO) began a multisite study on suicidal behaviors (SUPRE-MISS). One of the goals of this study was to perform social surveys to identify suicidal ideations and behaviors in certain areas. In Islamic Republic of Iran, the city of Karaj was selected for the survey (10). The lifetime prevalence of suicidal thoughts, plans and attempts was 14.1, 6.7 and 4.2%, respectively. Accordingly, the proportion of suicidal attempt to suicidal thoughts and suicidal plans was 1 to 3.4 and 1 to 1.6, respectively, indicating that nearly out of each 3-4 people who have suicidal thoughts or out of each 1-2 people who have suicidal plans, one commits suicide. The proportion of suicidal plan to suicidal thought was 1 to 2.1 (10). In a more extended survey in the same city, Malakouti, et al. estimated the lifetime prevalence of suicidal ideations, planning and attempts as 12.7%, 6.2% and 3.3%, respectively (11).

Based on these data, suicide risk assessment is one of the most important domains of mental health care. Considering the low, but notable rates of completed suicide to suicidal thoughts (3, 10, 11), epidemiological studies require proper instruments to estimates suicidality in the general population. Nowadays, clinical interview is a gold standard for evaluating the suicide risk (12). However, such evaluations need major resources and are time-consuming. The high prevalence of suicide, difficult recognition of these thoughts and associated meaningful morbidity and mortality show the necessity of a valid, reliable, practical and rapid screening tool, without a need to specialized instructions. In the clinical fields, adding a self-reporting questionnaire could improve the process of suicidal evaluation by providing more information about those patients who may not be questioned about suicide ideation during clinical interviews or in those patients who do not express these thoughts during interviews (13-15). Moreover, self-reporting questionnaires are complementary and inexpensive tools for continual evaluations of the suicide risk. Several tools have been developed to evaluate suicide risk in clinical practice and research.

Beck Scale for Suicidal ideations (BSSI) is one of the most common questionnaires to evaluate suicidality, attributed about 12.7 times each year (16). Two review articles have shown that based on several aspects, such as purpose of evaluation (research, screening or intervention), respondents' age, time considerations and psychometric features, BSSI is one of the top instruments for assessing suicidality (17,18).

The reliability and validity of the BSSI in English language have been frequently reviewed and almost always the Cronbach's alpha coefficient was higher than 0.85, and its scores had proper correlations with the scores of depression, hopelessness, anxiety, history of suicide attempt and the suicide attempt in the future (7,12,13,15,19-28). This questionnaire was translated into various languages such as Chinese, Norwegian, Urdu and Persian (29-32).

Several researches were done in Iran using this scale, but unfortunately its psychometric properties have not been surveyed properly yet. For the first time, Rahimi described the reliability of the scale among the observers and described its correlation with both the Beck's helplessness and depression inventories (31). In another

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study, the validity and reliability of the BSSI was surveyed among soldiers. Cronbach's alpha coefficient for the first five screening items was 0.88, splitting-half reliability coefficient was 0.75, and the correlation between the BSSI scores and scores of depressive scale of the General Health Questionaire-28 (GHQ-28) was 0.69 (33).

Thus, there is still little information about the construct and criterion validity of this scale. It seems necessary to evaluate the psychometric features of this scale in the Iranian population more carefully. The purpose of this study was to evaluate the reliability, concurrent validity and factor structure of the Beck Scale for Suicidal Ideation (BSSI) on the general population of Tehran and investigate its factor structure.

Methods

Data

This was a cross-sectional study in which we used a two-stage cluster sampling method. Based on the lifetime prevalence of 12.7% for suicidal ideation in Karaj (11), considering a desired precision of 0.03 and the alpha error of 0.05, we needed about 475 individuals. Based on MacCallum, et al. study, to provide low communalities, and to have small number of factors and small number of indicators for each factor, a minimum sample size had to be 300 to determine the factor structure of the instruments (34). Nine hundred questionnaire packages were distributed; however, 365 packages (41%) were not returned or not completed properly and were excluded. In the first stage, 6 regions of Tehran were chosen randomly based on municipal regions. In each region, one point on the city map was selected randomly and two researchers (M. E. and Y. H.) referred to the location and evaluated 150 individuals in each region house-by-house (only one individual in every house) with a counter-clockwise direction. In every house, each respondent was asked to introduce a family member who is over 18 years of age to answer the questions. In apartment blocks, each unit was asked to introduce one person. Finally, 535 sets of questionnaires were fully completed (response rate of 59%).

Inclusion criteria were age of at least 18, person's satisfaction and having a mental capacity to be able to answer the questions (in a face-to-face interview). Individuals with well-known acute psychotic disorders were excluded.

Instruments

Background Information Questionnaire: Participants' gender, age, educational level, marital status, having children, employment status and income, family size, car and home ownership, religion, history of known psychiatric disorders and previous lifelong suicide attempt(s), history of having physical diseases and insurance support were recorded. In this article, the mentioned information has not been used for data analysis, and just the history of previous suicide attempt(s) and hospitalization in a psychiatric ward were included in the analysis. To ensure that the suicide items were filled correctly, in cases of positive responses, the answers were reconfirmed by explaining to the participants that we aimed to assess the actual suicide attempts with the goal of taking one's life.

Beck Scale for Suicidal Ideation (BSSI): This scale is a 19-items instrument that evaluates the presence and intensity of suicidal thoughts in a week before evaluation (19). Self-reporting edition of the scale was introduced by Beck et al., in 1988 (13). Each item is scored based on an ordinal scale from 0 to 2 and the total score is 0 to 38. Individuals answer to the first 5 items which is excerpted. If individual's answer to the fifth item is positive (scores 1 and 2), he/she answers the rest of the items and otherwise the questionnaire is completed. No cut- point was used to categorize the scores (35). Hence, we used the scores of the screening part (first fifth items) and the total scale for data analysis. In this study, the first two clinical psychologists separately translated the instrument into Persian and

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then a backward translation was done by an independent person and this translated version was compared with the original to detect any misunderstandings or translation errors. After editing the Persian version of the questionnaire, we used it in a pilot assessment of five lay persons to detect any conflicting or incomprehensible items.

Beck Hopelessness Scale (BHS): The scale was introduced in 1988 and includes 20 items which are answered as true or false (36). This scale evaluates three aspects of hopelessness: individual's feelings about the future, losing motivation and expectations. Cronbach's alpha coefficient of the scale in the general population ranged from 0.82 to 0.93 (36). In Iran; the Cronbach's alpha coefficient of the scale has been estimated 0.79 and the five-factor structure has been described for it (37).

Philips Social Support Appraisal Scale: The questionnaire consists of 23 items which includes three areas of family, friends and others (38). In Iran, Cronbach's alpha coefficient of the scale and splitting-half reliability coefficient were reported 0.84 and 0.82, respectively (39).

Symptoms Checklist-90-Revised (SCL-90-R): This 90-item questionnaire was made by Derogates, et al. and it is one of the most common questionnaires for evaluating the public health that is annually cited by about 50.8 article (16). In the present research, we used main symptom subscales, along with the Global Severity Index (GSI) which is considered one of the best single indexes of the present severity of individual's psychiatric problems (40). Several surveys showed the reliability and validity of this checklist in Iran (41).

Statistical Analysis

Statistical analysis was carried out using SPSS. In addition to describing background data and scale scores, Cronbach's alpha coefficient of the BSSI scores were calculated separately for the screening part and the total scale. Pearson's correlation coefficient between BSSI scores and the scores of other questionnaires was calculated. The mean scores of the BSSI scores were compared between the two groups with and without a history of suicide attempt or psychiatric hospitalization using Mann-Whitney U test. The principal component method was used for factor analysis. With respect to the existence of considerable correlation between the ingredients of the whole scale, we used the oblique (promax) rotation in a non-rotation analysis. We considered eigenvalues greater than 1 and factor loadings greater than 0.4 acceptable (42). In all cases, type I error (alpha) was set at 0.05.

Results

In this survey, 535 individuals were evaluated; of whom, 138 (26%) were male. The mean (±SD) age of these individuals was 27.0 (± 9.5) years, with a median of 24 years (range: 18-70 years). Other characteristics of individuals are shown in (Table 1).

Distribution of Answers

The first five items of the BSSI constitute the screening part of the scale. The distribution of individual's answers to these five items has been shown in Table 2.

Fifty-one people (9.5 %) had given a positive response to the fifth item, so they answered the next 14 items (Table 3).

The mean score (± SD) of the first five items of the BSSI (screening part) was 6.2 ± 1.9 in these 535 individuals (median: 5, range: 5 to 14). The mean total score of 51 persons who had answered the whole questionnaire (± SD) was 30.8 ± 6.0 which was in the range of 5 to 44 (median: 30).

Internal Consistency

Cronbach's alpha coefficient for the screening part and the whole scale was 0.829 and 0.837, respectively. The inter-item correlations of the first five items of the BSSI ranged from 0.720 (between the second and third items) to 0.246 (between the fourth and fifth items). The item- to-total correlation coefficients of the screening part of the questionnaire were 0.851, 0.864, 0.861, 0.637 and 0.600, respectively. These correlation coefficients for the whole

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Table 1. Frequency Distribution of the Demographic and Baseline Variables of the individuals (n = 535) to Evaluate the Psychometric Features of the Beck Scale for Suicidal Ideation (BSSI).

Variable	Category	N (%)
Gender	Male	138 (25.8)
	Female	397 (74.2)
Educations	Illiterate	3 (0.6)
	Preliminary	25 (4.7)
	High school diploma	150 (28.0)
	University	357 (66.7)
Marital status	Single	363 (67.8)
	Married	155 (29.0)
	Divorced or separated	15 (2.8)
	Widow	2 (0.4)
Monthly family income	< 5000000 Rials.	118 (22.1)
	5000000 to 10000000 Rials.	296 (55.3)
	> 10000000 Rials.	121 (22.6)
Employment	Unemployed	37 (6.9)
	Housewife	37 (6.9)
	School or College Student	265 (49.6)
	Other jobs	196 (36.6)
Known Physical Diseases	Yes	129 (24.1)
Known Psychiatric Disorders	Yes	36 (6.7)
	Any mood disorders	27 (5.0)
	Any anxiety and obsessive-compulsive disorders	20 (3.7)
	Personality disorders	2 (0.4)
	Psychotic disorders	1 (0.2)
History of Psychiatric Hospitalization	Yes	10 (1.9)

Table 2. Frequency Distribution of Individuals' Answers (n = 535) to the First Five Items (screening part) of the Beck Scale for Suicidal Ideation (BSSI).

Items	Option 1 (Score 0)		Option 2 (Score 1)		Option 3 (Score 2)	
	N	%	N	%	N	%
Wish to Live	383	71.6	128	23.9	24	4.5
Wish to Die	391	73.1	124	23.2	20	3.7
Reasons for living/dying	423	79.0	87	16.3	25	4.7
Desire to Make Active Suicide Attempt	454	85.2	68	12.7	11	2.1
Passive Suicide Desire	484	90.5	43	8.0	8	1.5

questionnaires ranged from 0.219 (for item 17) to 0.736 (for item 3) and all were statistically significant at the alpha level of 0.05.

Factor Analysis

In the factor analysis of the screening part of the BSSI, Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.833, which showed adequate sample size. Bartlette's test of sphericity was statistically meaningful, (X^2=1052.308; df=10; p<0.001). Factor analysis was done using principal component method without rotatory solution. This analysis showed a common single factor which included all five items. The eigenvalue of this factor was 2.977, and it accounted for 59.5% of the total variance. Correlations between the first five items and this factor (factor loadings) were 0.847, 0.866, 0.864, 0.625 and 0.611, respectively.

Correlations with Psychiatric Profile

Table 4 demonstrates the correlations between the BSSI scores (both the screening part and the total scale) and scale scores of the Symptom Checklist-90-Revised (SCL-90-R). As observed in Table 4, the score of the screening part had a high correlation with depression scale (r=0.572). The correlation was also considerable with the scales of anxiety (r=0.464), psychoticism (r=0.440), and hostility (r=0.408). Pearson's correlation coefficient was also calculated as 0.516 between this scale and Global Severity Index (GSI). The scores of the total BSSI showed the highest correlation with depression scale (r= 0.508), but it was also considerable in the case of obsessive-compulsive scale (r= 0.421). Pearson's cor-

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Table 3. Frequency Distribution of Individuals' Answers (n = 51) to the Second 14 Items of the Beck Scale for Suicidal Ideation (BSSI)

Items	Option 1 (Score 0)		Option 2 (Score 1)		Option 3 (Score 2)	
	N	%	N	%	N	%
Duration of Suicide Ideation/Wish	29	56.9	15	29.4	7	13.7
Frequency of Suicide Ideation	21	41.2	25	49.0	5	9.8
Attitude toward Ideation/Wish	10	19.6	30	58.8	11	21.6
Control over Suicidal Action/Acting-Out Wish	34	66.7	13	25.5	4	7.8
Deterrents to Active Attempt	31	60.8	15	29.4	5	9.8
Reason for Contemplated Attempt	18	35.3	12	23.5	21	41.2
Method: Specificity or Planning for Contemplated Attempt	36	70.6	12	23.5	3	5.9
Method: Availability or Opportunity for Contemplated Attempt	44	86.3	4	7.8	3	5.9
Sense of Capability to Carry Out the Attempt	22	43.1	21	41.2	8	15.7
Expectancy/Anticipation of the Actual Attempt	20	39.2	29	56.9	2	3.9
Actual Preparation for Contemplated Attempt	43	84.3	6	11.8	2	3.9
Suicide Note	47	92.2	4	7.8	-	-
Final Acts in Anticipation of Death	44	86.3	7	13.7	-	-
Deception or Concealment of Contemplated Suicide	23	45.1	18	35.3	10	19.6

Table 4. Pearson's Correlation Coefficients between the BSSI Scores and the Scores of the Symptoms Checklist-90-Revised scales (SCL-90-R). The Numbers Inside the Bracket Show P

Scale	Screening part (p value) n= 535	Whole scale (p value) n= 51
Somatization	0.137 (0.002)	0.288 (0.040)
Obsessive-Compulsive	0.393 (< 0.001)	0.421 (< 0.001)
Interpersonal Sensitivity	0.115 (0.009)	0.250 (0.076)
Depression	0.572 (< 0.001)	0.508 (< 0.001)
Anxiety	0.464 (< 0.001)	0.314 (0.025)
Hostility	0.408 (< 0.001)	0.159 (0.264)
Phobic Anxiety	0.285 (< 0.001)	0.261 (0.064)
Paranoid Ideation	0.399 (< 0.001)	0.120 (0.401)
Psychoticism	0.440 (< 0.001)	0.377 (< 0.001)
Global Severity Index (GSI)	0.516 (< 0.001)	0.422 (0.002)

relation coefficient was also 0.422 between the total scores and Global Severity Index (GSI).

Pearson's correlation coefficients between the BSSI scores and the score of social support scale was also -0.308 ($p< 0.001$) for the screening part and -0.430 ($p= 0.002$) for the whole scale, which showed that the scores of BSSI decrease by the increase of the social support. Correlations between the scores of the screening part of the BSSI (but not the total scores) and hopelessness scale were also statistically significant ($r= 0.320$; $p< 0.001$). The correlation coefficient between the total score and hopelessness scale was 0.108 ($p= 0.462$).

Among the individuals who participated in this survey, 37 (6.9%) had a history of suicide attempt(s); among whom, 26 individuals (4.9 percent) had a history of one time suicide attempt, and 9 (1.7 percent) acted twice, one person (0.2%) acted three times and another person acted four times. Kendal's correlation coefficient (tau-b) between the total BSSI and screening scores and the number of suicide attempts was 0.257 ($p= 0.001$) and 0.181 ($p= 0.111$), respectively. The mean score of the screening part of the BSSI (± SD) in individuals who had a history of suicide attempt was 8.5 ± 2.7, and in others it was 6.0 ± 1.7 (Mann-Whitney U test; $p< 0.001$). The mean score of the total BSSI (± SD) was 29.6 ± 5.4 in individuals who experienced suicide and it was 32.9 ± 7.6 in other people, which was not considered statistically significant (Mann-Whitney U test; $p= 0.084$). The mean screening part score (± SD) in those with a history of psychiatric hospitalization was also 9.5 ± 2.0, and it was 6.0 ± 1.8 in others (Mann-Whitney U test; $p< 0.001$). These statistics for the total BSSI score were 33.8 ± 6.3 and 30.3 ± 5.9, respectively (Mann-Whitney U test; $p= 0.169$).

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Discussion

The present study was devoted to evaluate the psychometric properties of the Persian translation of the Beck Scale for Suicidal Ideation (BSSI). To promote the methodological validity of the study, we used considerable sample size from the general population of Tehran, using a multi-stage random sampling method. To show the reliability of the scale, we used Cronbach's alpha coefficient as one of the best methods to evaluate the internal constancy. This coefficient was higher than 0.8 for both the screening part and the whole scale, and it showed excellent internal consistency (43). In this study, we compared the scale scores between the two groups with and without history of suicide attempt to show retrospective (postdictive) validity of the scale. As a limitation of this study, considering its cross-sectional method, we used the history of suicide attempt, instead of pursuing people in terms of the suicide attempt in the future. Based on the obtained information, about 7% of the surveyed sample had a history of suicide attempt. The score of the screening part and the total score of the scale in this group were significantly higher than the others. Expressing the history of attempted suicide is subject of recall bias, as well as confronting social stigmatization and being judged. Additionally, we did not evaluate the participants by a deep interview. Therefore, this finding should be interpreted cautiously.

In this study, the relationship between suicidal thought and some of the mental health variables was surveyed as well. We expected if the considered scale surveys the suicidal thoughts properly, a significant relationship would be seen with some constructs like depression, hopelessness and social support. The relationship of suicide with depression has been well known for years, and it has been stated that about 60 to 70 percent of suicide victims have had significant degrees of depression (44).

Thinking about death is one of the diagnostic criteria of the major depressive episode (45), and it can be assigned as a part of depression construct (46, 47). In our study, and based on the depression scale from the Symptom Checklist-90-Revised (SCL-90-R), the correlations between the screening part of the scale and the whole scale were greater than 0.5 and were considered statistically significant. Anxiety disorders, like panic disorder, have also a significant relationship with suicidal behaviors (44). In our study, correlations between the scale scores and anxiety score in SCL-90-R were between 0.25 and 0.5 ($p < 0.05$), indicating weaker relationships.

Psychoticism was another construct which had a significant correlation with suicidal ideation ($r > 0.4$). The relationship between psychotic disorders and suicidal behavior has been shown (44,48-50). However, the relationship between psychoticism (not psychotic disorders) and suicidal thoughts is not well known. The relationship between suicidality and obsessive-compulsive disorder and obsessive-compulsive personality disorder has been just recently addressed (51-54). The correlation of obsessive symptoms severity, based on the Yale-Brown Obsessive-Compulsive Scale, and BSSI has been reported to be 0.680 (55). In this study, the correlation of the BSSI total scores and the obsessive-compulsive scale of SCL-90-R was 0.4.

Hostility was another psychological structure which had a significant correlation with the scores of the screening part of the BSSI ($r \approx 0.4$). Basically, suicide attempt is a type of hostility and aggression towards self (56). Hostility has been considered interrelated with self-destroying behaviors and suicide attempt in psychiatric patients (57,58). Additionally, hostility was correlated with BSSI in epileptic patients (59). Among men, the risk ratio of suicidal behavior in individuals who had reported high levels of hostility was 3.6 times of the individuals with low levels of hostility, although this relationship was not seen in women (60). In contrast, in another study on depressed patients, no significant relationship was found between hostility and

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suicidal thoughts (61). In a survey, the cognitive component of hostility, and not its behavioral component, was one of the predicative factors for suicide related deaths which had an independent relationship with depression (62).

In general, the screening part and the total scale scores of the BSSI had a significant correlation with Global Severity Index (GSI), ($r \approx 0.5$ and $r \approx 0.4$, respectively). The relationship of suicidal thoughts severity and GSI has been shown previously (63). This correlation is aligned with the psychiatric literature which correlates to the suicidal behaviors with mental disorders, but it is not limited to such disorders (44). Our finding is aligned with that of Anisi, et al. who showed a correlation of 0.57 between BSSI scores and GHQ-28 total scores (33).

Although no construct or questionnaires predict suicide attempt in the future on itself, it seems that Beck Hopelessness Inventory (BHI) is the best questionnaire for suicide prediction (44). In a prospective study, BHI scores of 10 or more correctly predicted 91% of the eventual suicide within 5 to 10 years in psychiatric patients who had been hospitalized due to suicidal ideations, but without suicide attempt (20). On the contrary, there were weak correlations between BHI scores and screening part of the BSSI ($r \approx 0.3$) or the total scores ($r \approx 0.2$) in our study. This finding needs more investigation due to the powerful theoretical base of the relation between hopelessness and suicidality. Finally, a negative fair correlation was observed between the BSSI scores and social support scale scores ($-0.5 < r < -0.3$). Living alone, isolation and economic concerns have been known as risk factors for suicide (44). Hazard ratio of suicide attempt has been reported 3.6 in individuals who perceived low social support (64).

To investigate the factor structure of the BSSI, we used principal component method for factor analysis. According to KMO values, sample size for this analysis was adequate. We found that all items in the screening part belonged to a common factor which explains about 60% of the variance of the scores. This common factor supports the underlying theory of constructing the scale. However, it seems that sample size for the factor analysis of the whole scale was not conclusive. Assessing a clinical sample may result in an efficient increase in sample size to examine the factor structure of the whole questionnaire.

Previous efforts to investigate the factor structure of BSSI did not result in uniform findings. However, according to Beck, et al. in discussing the factor structure of the original interview-based scale, the extracted factors can be accorded with their clinical concepts (19). In the attempt to clarify the factor structure of the scale and after removing factors which had fewer than three items, three factor remained (21): active suicide desire, preparation and passive suicide desire. By investigating the computer edition of the BSSI on psychiatric hospitalized patients with different mental disorders, the factor analysis of the scale with principal components method and oblique rotation extracted another three factors: desire to death, preparation for suicide and actual suicide desire. The two items of deterrents to death and deception or concealment were not loaded in any factors (21).

Conclusion

Despite the limitations of this study in terms of sample size, the cross-sectional design of the study, multiplicity of the questionnaires which may have effected the participants' precision, disuse of clinical interviews and open questions and unexplained relationships with some structures (like hopelessness), the psychometric properties of this scale can be considered as proper and can be used in research settings. Nevertheless, the prospective studies and studying psychiatric patients remain to be designated in the future.

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