

## **The Polish adaptation of *the Suicide Behaviors Questionnaire-Revised* by A. Osman et al.**

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### **Summary**

**Aim.** The aim of the study was to develop a Polish adaptation of the Suicide Behaviors Questionnaire-Revised (SBQ-R) by A. Osman et al. The questionnaire is a self-descriptive measure of suicidal tendencies (suicidal behaviors, including ideation and attempts) composed of four questions.

**Method.** A total of 926 university and post-graduate students from Lodz (526 women and 400 men) were included in the adaptation study. In addition, the Beck's Depression Inventory, the Psychological Pain Scale by Holden et al. and the Purpose in Life (PIL) test by Crumbaugh and Maholick were used to evaluate the construct validity of the SBQ-R.

**Results.** The exploratory and confirmatory factor analysis supported an assumed one-dimensional structure of the questionnaire, with satisfactory internal consistency, evaluated by Cronbach's alpha, equal to 0.83. The significant positive correlations were observed between the questionnaire scores and level of depression and psychological pain, while a negative correlation between the questionnaire scores and purpose in life. Participants who had previously demonstrated suicidal behavior, those who reported suicidal thoughts and those from a family with a history of suicide attempts or alcohol addiction obtained a significantly higher score in the SBQ-R.

**Conclusions.** The findings indicate that the Polish adaptation of the SBQ-R by Osman et al. has good psychometric characteristics and can be considered in both research and clinical practice.

**Key words:** suicidal tendencies, SBQ-R, Polish adaptation

### **Introduction**

In most countries, suicide is among the ten most common causes of death. According to the World Health Organization (WHO), approximately 800 thousand

people commit suicide each year, and this is the second most common cause of death among people aged 15–29 years [1]. The Polish Police Headquarters (Komenda Główna Policji – KGP) note a record number of suicides in the period 2013–2014 (more than 6,100 persons per year); although this number dropped in the years 2015–2017 (in 2017 – 5,276 persons), it is still a source of great concern. Attention has also been drawn by the much greater occurrence of suicide among men compared to women (6:1) [2].

Such a widespread of suicidal behaviors calls for efforts to diagnose risk factors early and accurately, and to develop prevention programs. Furthermore, it has been reported that a high proportion of those who commit suicide – particularly men – had not sought any form of institutional help [e.g., 3–5]. Therefore, research on the predictors of suicidal tendencies and behaviors, as well as the development and validation of screening methods allowing the identification of those at risk is of key importance. A widely-recognized and recommended tool to conduct population studies on this issue is the Suicide Behaviors Questionnaire-Revised (SBQ-R) by A. Osman et al. [6–8].

The SBQ-R was created on the basis of the 34-item questionnaire by M. Linehan et al., measuring the occurrence of suicidal thoughts and behaviors [9]. This method was then modified and abbreviated by the authors themselves, and later revised and psychometrically elaborated by A. Osman et al. [6, 10]. In this version it has currently been used in a number of countries [e.g., 8, 11]. The aim of the present study was to develop the Polish adaptation and validation of the SBQ-R.

### **Material and method**

The study validated the Suicide Behaviors Questionnaire-Revised (SBQ-R) by A. Osman et al. [6]. The questionnaire consists of four items. The first three items are related to a retrospective assessment of suicidal tendencies: (1) “Have you ever thought about or attempted to kill yourself?”; (2) “How often have you thought about killing yourself in the past year?”; (3) “Have you ever told someone that you were going to commit suicide, or that you might do it?”. Finally, the fourth question refers to a prospective assessment: (4) “How likely is it that you will attempt suicide someday?”. The responses are given on a scale from 1 to 3 for the first three questions, and from 0 to 6 for the final question. The total score ranges from 3 to 18 points. The authors provided the cut-off point at 8 points for people from clinical groups and 7 points for non-clinical groups. It is also suggested that the first question may be used alone for screening, and in such a case the cut-off value is 2 points [6].

The original version is characterized by good psychometric properties – Cronbach’s  $\alpha$  was found to range from 0.76 to 0.87 depending on the sample; the questionnaire demonstrated positive associations with the Beck Hopelessness Scale (BHS), the results of which are considered to predict suicide tendencies [6]. Similarly, foreign adaptations

of the questionnaire also show satisfactory psychometric characteristics of the tool. For example, Cronbach's  $\alpha$  was found to be 0.72 for the German version, and 0.78 for the Portuguese version. These studies revealed significant and expected relationships with other methods assessing depression and suicidal tendencies. The SBQ-R (overall score and the scores of each item) differentiated between people who had engaged in suicidal behavior in the past and those who had not [8, 11].

### **The development of the Polish version of *the Suicide Behaviors Questionnaire-Revised* and statistical analysis**

The validation began with the translation of the questionnaire items into Polish by two translators, followed by a back-translation into English by another two (including a sworn translator). After comparing the obtained versions, the final form of the questionnaire was established. Following this, its validity and reliability were tested. The factor validity was assessed with exploratory (EFA) and confirmatory factor analysis (CFA): EFA was used to examine the structure, and CFA to verify a single-factor structure of the Polish version of the scale.

The construct validity of the tool, both convergent and discriminant, was evaluated by the analysis of correlation coefficients between its results and the results of selected measurement tools. The reliability of the method was evaluated using Cronbach's  $\alpha$  coefficient for internal consistency, and the discriminant power of the items – the correlation coefficients between each item and the overall result. In addition, the mean scores obtained by participants with suicidal tendencies, with the history of suicidal tendencies in the family and those reporting alcohol problems in the family, were compared with those of the participants who did not report such phenomena. Finally, for potential screening properties of the questionnaire, a cut-off point was established, for both the first question and the total score, based on the ROC curve analysis. All the analyses were performed using Statistica 13 and STATA 13 software.

### **Participants and procedure**

The validation studies were conducted in 2015–2017<sup>1</sup> among students and post-graduate students of the University of Lodz, Lodz University of Technology, Medical University of Lodz, and the National Film School in Lodz. The ethical permission for the study was obtained from the Bioethics Commission for Academic Research, University of Lodz (Resolution No. 14/KBBN-UŁ/I/2015). Psychology students were excluded from the study. The participants completed the tool questionnaires at the end of classes, in groups or individually. The study was anonymous, participation

<sup>1</sup> The study was performed by, among others, Kinga Wydrych, Anna Moc, Alicja Sabat, and Karolina Opałka as part of a Master's degree program

was voluntary and not associated with any financial or other gratification. A total number of 950 participants took part in the study. After excluding questionnaires filled incorrectly, a total of 926 participants were included in the analysis. This group included 526 women (56.8%) and 400 men (43.2%) in the age range 18 to 33 years ( $M = 21.88$ ;  $SD = 2.16$ ). 398 participants (43%) were single, 501 (54.1%) stated being in an informal relationship, and 27 (2.9%) were married. The participants were also independently asked about their suicidal tendencies – 76 people (8.2%) declared that they had previously made at least one suicide attempt, while 453 (48.9%) admitted having suicidal thoughts. In addition, 109 people (11.8%) reported the occurrence of suicide attempts or suicide in their immediate family, and 225 (24.3%) reported that one of their parents was addicted to alcohol, drunk too much at that time or in the past.

### Methods used in the validation study

The following methods were used in the validation study:

- Beck Depression Inventory (BDI) [12], Polish adaptation by Parnowski and Jernajczyk [13], Cronbach's  $\alpha$  at the level of 0.92;
- Psychache Scale by Holden et al. [14], Polish adaptation by Chodkiewicz et al. [15] – Cronbach's  $\alpha$  at the level of 0.94;
- The Purpose in Life (PIL) scale by Crumbaugh and Maholic [16], Polish adaptation by Życińska and Januszek [17]. The PIL is a popular tool for measuring perceived purpose in life; Cronbach's  $\alpha$  for the total result was 0.88.

### Results

The analysis began by examining the distribution of the raw data (Table 1). It can be seen that the skewness and kurtosis did not exceed one, indicating an acceptable deviation from a normal distribution.

Table 1. Descriptive statistics for the whole sample

Variables	M	SD	Min.	Max.	Skewness	Kurtosis
Total SBQ-R	6.83	3.70	3.00	18.00	0.90	-0.20
Total SBQ-R – Women	6.85	3.89	3.00	18.00	0.94	0.06
Total SBQ-R – Men	6.47	3.65	3.00	18.00	0.84	-0.48

M – mean; SD – standard deviation

The scores obtained by the men were also compared with those of the women. No significant gender differences were observed between each of the items and the overall result ( $t(924) = 1.35$ ;  $p = 0.18$ ). Also, no significant relationship was found between the total score and age of the respondents (Spearman's  $\rho = 0.02$ ) or with the declared relationship status ( $F(2, 923) = 0.35$ ;  $p = 0.70$ ).

### Factor validity

To verify the internal structure both EFA and CFA were used. The data from the entire sample ( $n = 926$ ) were randomly divided into two subgroups ( $n = 463$  each) – EFA was performed in one group and CFA in the other.

Before beginning the factor analysis, the adequacy of the data was tested with the Kaiser-Meyer-Olkin (KMO) test. Its result ( $KMO = 0.81$ ) and the Bartlett's sphericity test ( $\chi^2 = 1,501.90$ ;  $df = 6$ ;  $p < 0.001$ ) informed about sufficient sampling adequacy. Both the scree plot and Kaiser criterion indicated only one factor that explains 68.6% of the scoring variance, as also noted in the original version. All the items were found to have factor loadings above 0.7.

The confirmatory analysis of the assumed one-factor model (without correlation of measurement errors) also achieved a satisfactory goodness of fit ( $\chi^2 = 4.91$ ;  $df = 2$ ;  $p = 0.08$ ;  $CFI = 0.99$ ;  $TLI = 0.98$ ;  $RMSEA = 0.071$  with 90% CI [0.02; 0.14];  $SRMR = 0.01$ ). The SBQ item 3 and the SBQ item 4 demonstrated slightly lower loading values, but they were still higher than the criterion value of 0.5. The results of the EFA and CFA are given in Table 2.

Table 2. **Factor loadings of the SBQ-R items obtained in the exploratory and confirmatory factor analysis**

Items	Factor loadings	
	EFA	CFA
SBQ 1. Have you ever thought about or attempted to kill yourself?	0.885	0.860
SBQ 2. How often have you thought about killing yourself in the past year?	0.863	0.829
SBQ 3. Have you ever told someone that you were going to commit suicide, or that you might do it?	0.742	0.678
SBQ 4. How likely is it that you will attempt suicide someday?	0.788	0.722

Note. All values significant at  $p < 0.001$

### Reliability

Internal consistency assessed using Cronbach's  $\alpha$  was 0.83. The data in Table 3 indicate that the coefficient did not increase following the removal of any item, even though the SBQ 3 has weaker status, which was also seen in the CFA results. The discriminant power of the items was satisfactory, ranging from 0.56 to 0.74 ( $p < 0.001$ ).

Table 3. **Discriminant power of the SBQ-R**

Items	Discriminant power coefficients	Cronbach's alpha with the item deleted
SBQ-R 1	0.74	0.72
SBQ-R 2	0.73	0.71

*table continued on the next page*

SBQ-R 3	0.56	0.81
SBQ-R 4	0.63	0.77

### Construct validity

#### *Relations with the symptoms of depression, psychological pain and purpose in life*

Construct validity of the questionnaire was evaluated on the basis of the analysis of correlations between its results and the results of scales measuring depression (BDI), psychological pain (Psychache Scale) and purpose in life (PIL). Psychological pain, defined as feelings of strong psychological suffering, demonstrates a close association with depression and suicidal tendencies [e.g., 18, 19]. The PIL questionnaire was selected due to proven relations between the sense of purpose in life and suicidal tendencies [e.g., 20, 21]. The results are presented in Table 4 (Spearman's rho correlations due to the skewed distribution of the criteria variables).

Table 4. **Construct validity – correlation coefficients**

Items	BDI	Psychache Scale	Purpose in life – PIL
SBQ-R 1	0.54	0.52	-0.75
SBQ-R 2	0.53	0.56	-0.74
SBQ-R 3	0.40	0.44	-0.69
SBQ-R 4	0.51	0.46	-0.70
Total SBQ-R	0.64	0.62	-0.76

All values significant at  $p < 0.001$

As expected, significant positive relationships were noted between all the items and the total SBQ-R score, and depression and psychological pain (moderate correlations). Also, analogous significant negative correlations were found with the PIL scale. Interestingly, these relationships were significantly stronger than those with depression and psychological pain.

#### Construct validity assessed using the known groups method

A comparison of the participants who had previously attempted suicide ( $n = 76$ ) and those who had not ( $n = 850$ ) found a significantly higher SBQ-R score (for each item and the overall score) for the former group (total SBQ-R  $M = 12.46$ ;  $SD = 3.29$  vs. total SBQ-R  $M = 6.44$ ;  $SD = 3.13$ ;  $t(924) = 11.28$ ;  $p < 0.001$ ; Cohen's  $d = 1.87$ ). An analogous difference with strong effect again was observed for comparison between people reporting having suicidal thoughts ( $n = 453$ ) and those denying the occurrence of such thoughts ( $n = 473$ ) (total SBQ-R  $M = 10.12$ ;  $SD = 3.20$  vs.  $M = 4.80$ ;  $SD = 2.53$ ;  $t(924) = 21.10$ ;  $p < 0.001$ ; Cohen's  $d = 1.66$ ).

Similar results were obtained, although with only moderate effect, for differences between respondents with ( $n = 109$ ) and without the family history of attempting suicide ( $n=817$ ) (total SBQ-R  $M = 8.13$ ;  $SD = 4.21$  vs.  $M = 6.44$ ;  $SD = 3.44$ ;  $t(924) = 3.78$ ;  $p < 0.001$ ; Cohen's  $d = 0.44$ ), and between participants with ( $n = 225$ ) and without family members addicted to alcohol or overusing it ( $n = 701$ ) (total SBQ-R  $M = 7.96$ ;  $SD = 3.92$  vs.  $M = 6.16$ ;  $SD = 3.09$ ;  $t(924) = 5.12$ ;  $p < 0.001$ ; Cohen's  $d = 0.58$ ).

### Cut-off point by ROC curve analysis

The ROC criterion for this target group was, similarly as in the study by Osman et al. [6], the self-reported presence of suicide attempts in the past (Table 5). The area under the curve (AUC) confirms that both the total score of the questionnaire and the individual score of the first item alone are valid bases for the classification. However, both the AUC and other parameters indicate that the classification based on the total score is likely to be more accurate. After further examination of diagnostic accuracy parameters, particularly Youden's index, a cut-off value of nine points was established for the Polish version of the SBQ-R, and three points for the first item. It can be seen that these values are higher than those reported for the original version. The overall accuracy of classification at this level is 84% for SBQ1 and 92% for the total SBQ-R, which is a satisfactory result, especially in the latter case. Moreover, mirroring the results for the descriptive statistics, there were no gender differences with regard to the obtained cut-off values.

Table 5. Summarized results of the ROC analysis

Variables	AUC	95% CI	Cut-off point	Characteristics for the cut-off point					
				Sensitivity	Specificity	Accuracy	Positive predictive value	Negative predictive value	Youden's index
SBQ1	0.86***	[0.84; 0.89]	3	0.73	0.89	0.84	0.75	0.89	0.62
Total SBQ-R	0.92***	[0.90; 0.92]	9	0.85	0.95	0.92	0.88	0.93	0.79

\*\*\*  $p < 0.001$

### Recapitulation

The aim of the study was to develop a Polish adaptation of the Suicide Behaviors Questionnaire-Revised (SBQ-R) by A. Osman et al. The need to adapt the method resulted from its popularity and short form enabling screening, as well as from the small number of standardized tools for studying suicidal tendencies available in Polish language.

The SBQ-R questionnaire comprises three questions regarding presence of the suicidal behavior and thoughts in the past and one regarding the likelihood of such behavior in the future. As such it is based on the frequently-reported association between previous suicidal tendencies and their future occurrence [e.g., 22–23]. Similar results were also obtained in the presented study when comparing the results of participants who had and had not attempted suicide in the past, as well as those who had reported and had not reported the occurrence of suicidal thoughts. The same relationships were noted in the adaptation studies conducted in other languages [8, 11].

The Polish version of the questionnaire demonstrated satisfactory psychometric characteristics in the studied sample of young adults. Moreover, the analysis of construct validity indicates that the results cannot be reduced to the measurement of depression and psychological pain. Interestingly, the absolute value of these correlations was lower than in the case of the purpose in life. From a psychometric point of view, the latter informs of a substantial amount of common variances, thus SBQ-R results are more likely to be predicted from the PIL scores than from the BDI scores. This suggests that loss of purpose in life may be a stronger correlate of suicidal thoughts than depressive symptoms and reported psychological pain. It also highlights the potential value of including this issue in suicide prevention alongside with areas directly designated by the depression criteria within the ICD-10. However, it requires further analysis, as it may be influenced by the specificity of the sample under evaluation.

In this regard, as indicated by our validation study, an important risk factor may also be the modeling of suicidal behaviors [e.g., 24, 25] and origin from families with alcohol problems [26–28]. Importantly, the questionnaire was found to be sensitive to identifying such risk groups.

Nevertheless, it is important to consider the limitations of the study. Firstly, as mentioned earlier, the study includes a group of participants from a relatively narrow age range and the obtained psychometric characteristics cannot therefore be automatically generalized. Secondly, the analysis was based only on self-description in the reporting both suicidal thoughts and behavior. At this point, it should be noted that the study recorded a relatively high level of suicidal thoughts and behaviors in the past (48.9% of respondents confirmed the occurrence of thoughts and 8.2% of past suicide attempts). An analysis of the literature indicates, however, that similar results were obtained in the studies on American young adults; for example, a study of 26 thousand students from 70 universities showed that 55% of them admit to having suicidal thoughts in the past [29]. Another population-based study on risk behaviors among people aged 10–24 ( $n = 15,624$ ) found that 8.6% had attempted suicide or serious self-injury in the past [30]. Thus, it can be concluded that the results of the Polish sample do not differ widely from those of foreign studies on similar age groups. However, in the elderly and in clinical groups, the relationship may be different and the proposed cut-off point may not apply.

In conclusion, with the awareness of the limitations, the Polish adaptation of *the Suicide Behaviors Questionnaire-Revised* by A. Osman et al. can be considered useful in clinical and screening research as well as in diagnosing the risk of suicide in therapeutic practice in relation to young adults. Its advantage is a brief form together with a high reliability, good discriminant power and relative independence of depressive symptoms assessment.

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