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Diagnostic accuracy of the Verbal Suicide Scale (VSS) in the group of psychiatrically hospitalised patients

Abstract

Introduction: The purpose of this study is to present the validation process of the Verbal Suicide Scale (VSS). The method was developed to assess the psychiatric patients' attitudes towards suicide. The researchers decided to determine the diagnostic capabilities of the tool in the process of anticipating suicidal behaviour.

Material and methods: The study covered 157 psychiatrically hospitalised patients, who were examined with the VSS, C-SSRS, NGASR scales, SOC-29 questionnaire, and descriptive questionnaire. The relations between the VSS results with the number of suicide attempts, psychiatric diagnosis, and age were subject to analysis in terms of psychometric properties in three groups of psychiatrically hospitalised patients divided by the circumstances in which they were admitted to the hospital.

Results: The results of the VSS subscales reveal the Spearman's rho ($p < 0.05$) with SOC-29 scales, C-SSRS risk factors and protective factors, NGASR scale, as well as demographic and general variables. There are also intergroup differences proved with the Mann-Whitney U test depending on the presence of risk factors. Certain attitudes towards suicide are related to the occurrence of individual risk factors.

Conclusions: The obtained results suggest that suicide is an action independent of the conscious attitude itself. The VSS results refer to the greatest extent to patients abusing/addicted to psychoactive substances. Further studies in the group of subjects are required.

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Key words: *psychiatry, suicide, diagnosis, suicide prevention, psychometrics*

Introduction

This study is a continuation of the paper presenting the construction and factor structure of the Verbal Suicide Scale (VSS). The conducted factor analysis showed that the VSS structure is consistent with theoretical assumptions and a satisfactory internal consistency of individual factors. The authors distinguished three subscales determining the subjects' attitudes towards suicide. The subscales were named as follows: suffering avoidance subscale (I), internalised aggression subscale (II), and sense of hopelessness subscale (III) [1]. Due to the fact that the VSS refers to attitudes towards suicide rather than directly to the patient's clinical condition or en-

vironmental risk factors, an attempt to determine the method's accuracy in estimating suicide risk was made. The determination of the relations between the subscales and external methods as well as risk factor indicators and objective demographic factors serves the purpose of resolving two types of psychometric controversies.

One concerns the extent to which the latent variable in the form of suicide risk can be measured with the indicator referring to the implicit attitudes towards suicide [2, 3].

The other controversy concerns the perennial problem, originating from R. Cattell, of whether the scale obtained as a result of the factor analysis measures implicit objective factors or is a mere effect of statistical data organisation [4, 5].

The purpose of this study is to determine the VSS accuracy in terms of criteria and theory.

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Material and methods

Examined groups

The study covered 157 patients hospitalised psychiatrically in the Clinic of Psychiatry, Faculty of Health Sciences, Medical University of Warsaw. Females constituted 46% (N = 72) and males — 54% (N = 85) in the examined group. The mean age was M = 36.3. The socio-demographic data of the examined sample are presented in Table 1.

The subjects were divided into three groups depending on the circumstances in which they were admitted to the hospital. The first group, which constituted 34% of all subjects, comprised the patients who were admitted directly after their suicide attempts (N = 54). The second group included 32% of the subjects, that is ones who declared their suicidal ideations or tendencies on admission (N = 50). The third group covered 34% of all patients, namely persons who did not manifest their suicidal tendencies in the admission room or directly before hospitalisation (N = 53).

Diagnostic methods

The Columbia-Suicide Severity Rating Scale (C-SSRS) is one of the most popular diagnostic tools for suicide risk assessment. This study uses the C-SSRS Suicide Risk Assessment Version (Excerpt), which includes the assessment of suicidal behaviour over a lifetime and the past three months, intensity of suicidal ideation over the past month, treatment history, triggering, clinical and protective factors [6, 7].

The Nurses' Global Assessment of Suicide Risk (NGASR) is a tool intended for suicide risk assessment in the clinical setting. The idea of its authors was to ensure support to less experienced medical staff who, due to lack of experience or consultation opportunities, are excessively burdened with the responsibility of differentiation. The method has the form of a list consisting of 15 items covering psychosocial stressors which are closely related to suicide. The individual variables are scored differently and the final result permits the identification of the risk level, which in turn determines different actions varying in terms of the level of staff engagement in patient care [8, 9].

The SOC-29 questionnaire serves the purpose of measuring the sense of coherence. It consists of 29 items formulated in questions. The sense of coherence (SOC) concept was developed by Aaron Antonovsky in 1979 to explain why stress can trigger disease in some, while others remain healthy. SOC is defined as "the extent to which one has a pervasive, enduring though dynamic, feeling of confidence that one's environment is predictable and

Table 1. Demographic data in the group of subjects

Psychiatric diagnosis acc. to ICD-10	N	%
F10-F19	38	24
Mental and behavioural disorders due to use of psychoactive substances	50	32
F20-F29	24	15
Schizophrenia, schizotypal and delusional disorders	21	14
F30-F39 Mood (affective) disorders	24	15
F40-F49		
Neurotic, stress-related and somatoform disorders		
F60-F69		
Disorders of adult personality and behaviour		
Education		
Primary	26	16.5
Vocational	25	16
Secondary	80	51
Higher	26	16.5
Marital status		
Single	83	53
Married	53	34
Widowed	2	1
Divorced	19	12

that things will work out as well as can reasonably be expected". According to research, a high sense of coherence contributes to better coping with pain involved in the disease, protects against depression, improves quality of life, and reduces the feeling of fatigue, loneliness and fear. The questionnaire is composed of the total result and three subscales: comprehensibility, manageability, meaningfulness. The respondent gives answers using the 7-point Likert scale [10–14].

The descriptive questionnaire included age, education, marital status, place of residence, source of income, number of hospitalisations, number of suicide attempts, and presence of somatic diseases.

Procedure of the study

The study was conducted individually by trained psychologists employed in the Clinic. The training in C-SSRS use covered an interactive online course completed with certification of the tool application skills. All tests were carried out in the psychologist's office in the Clinic. The subjects agreed to take part. The researchers also received consent for conducting the study from the Bioethics Committee of the Medical University of Warsaw, which did not express any objections to the method or procedure of the study.

Nosological diagnoses were made according to ICD-10 by the Clinic's staff based on an interview, psychiatric observation, medical documentation, and psychological testing.

Statistical analyses

The StatSoft STATISTICA 13 package licensed by the Medical University of Warsaw was used to analyse the obtained data.

Results

Factor analysis

In order to review scale factors, a factor analysis was carried out with the use of the Varimax method. The following three factors corresponding to the earlier subscales were obtained: suffering avoidance subscale (I), internalised aggression subscale (II), and sense of hopelessness subscale (III). The Table 2 presents subsequent items on the scale and the reliability level determined based on the Cronbach's Alpha coefficient for the individual subscales. All three subscales achieved satisfactory levels of reliability.

The frustration, capitulation and crisis items did not load on any factor and therefore were removed.

Correlations between the VSS results and the C-SSRS, NGASR and SOC-29 results

The correlations analysis covered the results of the VSS subscales, C-SSRS, NGASR scales, as well as SOC-29 and descriptive questionnaires. Due to the lack of normal distribution of the results in quantitative variables and the use of C-SSRS variables on ordinal scales, Spearman's rank correlation coefficient was applied. The analyses were carried out in the whole examined group and in groups distinguished by the reason of hospitalisation and psychiatric diagnosis. Raw VSS results were used in the analyses (Table 3).

A relation between the sum of protective factors, which were identified based on the C-SSRS, and the VSS subscale 1 (Spearman's rho = −0.29, p < 0.05), as well as the C-SSRS risk factors and the VSS subscale 1 results (Spearman's rho = 0.36, p < 0.05) and the general VSS result (Spearman's rho = 0.30, p < 0.05) was revealed in the group of patients hospitalised after a suicide attempt.

Table 2. Analysis of internal consistency of individual subscales

Subscale 1 (11 items):	Subscale 2 (11 items):	Subscale 3 (5 items):
Disburdenment	Demonstration	Helplessness
Resolution	Rage	Powerlessness
Peace	Sin	Surrender
Escape	Punishment	Resignation
Appeasement	Manifestation	Weakness
Relief	Manipulation	*Alpha = 0.7237*
Alleviation	Lesson	
Release	Hatred	
Freedom	Tragedy	
Salvation	Fault	
Liberation	Anger	
Alpha = 0.8816	*Alpha = 0.7729*	

Table 3. The strongest relations between individual VSS subscales and SOC-29 questionnaire subscales determined based on Spearman's rho (p < 0.05)

	SOC-29 Comprehensibility	SOC-29 Manageability	SOC-29 Meaningfulness	SOC-29 Total result
No division into groups (N = 157)				
VSS Subscale 1	−0.26	−0.34	−0.40	−0.39
VSS Subscale 2	–	–	–	–
VSS Subscale 3	−0.27	−0.22	–	−0.27
VSS Total result	−0.36	−0.35	−0.32	−0.40
Patients hospitalised after a suicide attempt (N = 54)				
VSS Subscale 1	−0.34	−0.31	−0.51	−0.41
VSS Subscale 2	–	–	–	–
VSS Subscale 3	−0.36	−0.30	–	−0.36
VSS Total result	−0.46	−0.31	−0.38	−0.44
Patients admitted to the hospital with suicidal ideation/tendencies (N = 50)				
VSS Subscale 1	–	–	–	–
VSS Subscale 2	–	–	–	–
VSS Subscale 3	–	–	–	–
VSS Total result	–	–	–	–
Patients without suicidal behaviour before hospitalisation (N = 53)				
VSS Subscale 1	–	−0.44	–	−0.39
VSS Subscale 2	–	–	–	–
VSS Subscale 3	−0.30	–	–	−0.30
VSS Total result	−0.28	−0.42	–	−0.40

Subscale 2 correlated positively with the number of the suicide attempts identified based on the C-SSRS, which were prevented over the past three months (Spearman's rho = 0.27, p < 0.05) and a lifetime (Spearman's rho = 0.29, p < 0.05).

A relation between the VSS subscale 1 and the intensity of suicidal behaviour on the C-SSRS (Spearman's rho = 0.31, p < 0.05) was found in the group of patients admitted to the hospital with suicidal ideation/tendencies. The total VSS result correlated positively with the total number of protective factors on the C-SSRS.

A correlation between VSS subscale 2 and the number of hospitalisations revealed among the patients who were hospitalised with no connection to suicidal behaviour (Spearman's rho = 0.36, p < 0.05).

In order to determine the relations between the VSS results with additional criteria taken into account, the researchers made a division into groups by psychiatric diagnoses.

From among all groups, the strongest relation between the scale results was disclosed in the group of patients hospitalised with ICD-10 F10-F19 diagnosis (N = 38). They are presented in Table 4.

A relation between the VSS subscale 2 and the number of hospitalisation (Spearman's rho = 0.33, p < 0.05) and the sum of C-SSRS protective factors (Spearman's rho = −0.30, p < 0.05) was identified in the group of patients with ICD-10 F20-F29 diagnosis (N = 50).

The results concerning patients with mood disorders F30-F39 (N = 24) revealed a relation between the VSS subscale 3 results and the number of the suicide attempts identified based on the C-SSRS, which were prevented over the past three months (Spearman's rho = -0.42, p < 0.05) and a lifetime (Spearman's rho = 0.49, p < 0.05), as well as the total VSS result and the number of the suicide attempts identified based on the C-SSRS, which were prevented over a lifetime (Spearman's rho = 0.42, p < 0.05).

No significant relations between the VSS results and other data were found in the group of patients diagnosed with neurotic disorders F40-F49 (N = 21).

Subscale 1 correlated positively with the number of the suicide attempts prevented over the past three months (Spearman's rho = 0.45, p < 0.05) and a lifetime (Spearman's rho = 0.44, p < 0.05) in patients diagnosed with

Table 4. *Analysis of the Spearman's rho (p < 0.05) in the group of patients with F10-F19 diagnosis (N = 38)*

VSS subscale 1	sum of risk factors on C-SSRS (Spearman's rho = 0.35)
VSS subscale 3	C-SSRS: sum of risk factors (Spearman's rho = 0.44), C-SSRS: number of actual suicide attempts over a lifetime (Spearman's rho = 0.44), number of psychiatric hospitalisations (Spearman's rho = 0.36), total NGASR result (Spearman's rho = 0.40)
Total VSS result	C-SSRS: sum of risk factors (Spearman's rho = 0.42), number of actual suicide attempts over a lifetime (Spearman's rho = 0.47), total NGASR result (Spearman's rho = 0.33)

personality disorders F60-F69 (N = 24). The VSS subscale 2 correlated negatively with age (Spearman's rho = –0.48), and so did the total VSS result (Spearman's rho = –0.41, $p < 0.05$), which was additionally related to the number of the suicide attempts identified based on the C-SSRS, which were prevented over the past three months (Spearman's rho = 0.48, $p < 0.05$).

Intergroup differences depending on the reason of hospitalisation

Data analysis revealed significant differences between results on the individual VSS subscales depending on the presence of the risk factors identified on the C-SSRS. The analyses applying the Mann-Whitney U test were used to this end. Significantly higher results on the VSS subscale 1 (suffering avoidance) were obtained by the patients with risk factors such as despair ($p < 0.05$), the sense of being a burden for the family or other people ($p < 0.05$) and refusal or disagreement to a suicide counteraction plan ($p < 0.05$). Differences were noticeable also in the case of the presence of a protective factor in the form of having reasons to live, where the subscale 1 results proved significantly lower ($p < 0.05$).

The intergroup differences with reference to the VSS subscale 2 results (internalised aggression) concerned the presence of risk factors: a severe depressive episode ($p < 0.05$), abuse of or addiction to psychoactive substances ($p < 0.05$), aggressive behaviours towards others ($p < 0.05$), and family history of suicide (over a lifetime) ($p < 0.05$). The subscale results were higher ($p < 0.05$) in the group where the above risk factors were identified. The presence of the protective factor in the form of the sense of responsibility towards one's family or other persons/life with the family involved a lower result on subscale 2 ($p < 0.05$).

On the VSS subscale 3 (sense of hopelessness), the subjects achieved significantly higher results in the group with the risk factor in the form of sexual abuse (over a lifetime) ($p < 0.05$), and in the group of subjects with suicidal behaviour over the past three months ($p < 0.05$). The total scale result proved to be higher in the group where patients displayed aggressive behaviours lately ($p < 0.05$) and lower in those who declared having reasons to live.

Sten norms

In order to enable the application of the VSS tool in the clinical practice, the researchers specified sten norms for each of the subscales and the total result. The sten scale is a popular psychological testing scale, which is

Table 5. *Sten norms for the Verbal Suicide Scale*

	Sten norms	Raw results (number of marked items)			
		Subscale 1	Subscale 2	Subscale 3	Total result
Low results	1	–	–	0	–
	2	–	–	–	0–1
	3	–	0	1	2–4
Average results	4	0–1	1	2	5–7
	5	2–3	2	3	8–10
	6	4	3	4	11–13
High results	7	5–6	4–5	–	14–16
	8	7–8	6	5	17–19
	9	9	7	–	20–23
	10	10–11	8–11	–	23–27

standardised so that the population average score is 5.5 (between the 5th and the 6th sten score), and the standard deviation is 2. The test is intended to differentiate within the "norm." There are 10 scores, from 1 to 10, on the scale. In order to transform raw data to the sten scale, the following formula was used: $S = 5.5 + 2 \times Z$, where Z is the result of the so-called Z standardisation. A score between the 7th and the 10th sten is considered a high one [15]. The norms are presented in Table 5 and permit the assessment of the score within the range from low to high.

Discussion of the results and conclusions

This study indicates that an implicit attitude towards suicide is not a good indicator of the latent variable of suicide risk. However, the obtained data bring valuable implications for the clinical practice, which could help the medical staff assess the patient's perception of suicide and facilitate the identification of the risk factors referring to the volitional phase of the suicide process.

The VSS subscale 1 (suffering avoidance), the VSS subscale 3 (sense of hopelessness), and the total VSS result are connected with a lower general level of coherence, which implies decreased sense of self-esteem, mood and fitness. This is confirmed by intergroup differences regarding risk factors, where subscale 1 is connected with avoidance tendencies, while subscale 3 with greater sense of helplessness and suffering. Only the VSS subscale 2 (internalised aggression) shows no connections with the sense of coherence, yet in the comparative analysis regarding risk factors, such as abuse of/addiction to psychoactive substances and aggressive behaviours, it is the increased result of this subscale that was related to their presence. In the context of VSS accuracy, it is the group of psychoactive substance abusers that draws a particular attention, revealing the VSS method accuracy in diagnosing the risk factors specified on the C-SSRS and NGASR scales. The explanation of this regularity can be sought in O'Connor's motivational-volitional theory. According to it, suicide is a gradual process during which various factors operate in different phases. Phase I — pre-motivational — encompasses personal vulnerability, environmental factors, and negative life events. It comprises all causal determinants which trigger the process. In phase II — motivational — suicidal ideation and intents occur. This stage usually begins with the sense of defeat and humiliation. If the problem-solving skills are insufficient, ruminations facilitating the sense of entrapment occur. If interpersonal factors, such as lack of social support, the sense of belongingness, or negative norms and attitudes, are also present, an individual might experience suicidal ideation and intents. Phase III — volitional — takes place only when volitional moderators occur: personal capability to make a suicide attempt, impulsivity, partial implementation of the plan, access to means. If these factors are present, suicidal behaviour occurs [16, 17].

Alcohol-dependent patients belong to a group which is particularly at risk of suicidal behaviour [18]. It can be assumed that alcohol, by weakening control mechanisms, facilitates venting behaviour, occurrence of depressive states and, as a result, considerably increases the risk of the last, volitional, phase of the suicide process [19]. The application of the VSS to identifying suicide risk based on the attitudes of the abusing/addicted patients requires further research. With reference to the obtained data, approximate characteristics of the persons marking certain associations on the VSS can be prepared. Those who mark more items on the Suffering Avoidance subscale experience the sense of coping poorly with the requirements of the environment and use the avoidance strategy more often. What prevails in their experience is despair and they reject attempts to help them more frequently. Those who mark more items on the Internalised Aggression subscale are more often persons having a problem with aggression, abusing or addicted to psychoactive substances. This group is more often characterised by the family history of suicide and severe depressive episodes. For persons from this group, the sense of responsibility for others is less frequently a protective factor. Those who mark more items loading on the Sense of Hopelessness subscale, like the persons giving more answers on the Suffering Avoidance subscale, have the sense of not coping with tasks, yet it is suffering and hopelessness that prevail in their experience. The history of sexual abuses and recent suicide attempts is more frequent in this group.

The above characteristics need to be approached with due caution, suitable for the method development phase. Its application facilitates the creation of the experience typology and can be helpful when studying the patient's experience in the therapeutic process. Due to the simplicity of the tool and possibility of a repetitive measurement, it can be applied in the clinical practice of psychologists, physicians and psychiatric nurses.

Limitations

Explaining intrapsychic processes on the basis of the observable behaviours is an object of a discussion taking place between behaviourists and advocates of the depth psychology for many years now [20]. Therefore, the research combining the above streams should encounter certain difficulties, which does not mean that consistency in making attempts, in particular in the context of suicide risk, is not necessary.

Piśmiennictwo

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