

## **WAR STRESSORS ASSESSMENT QUESTIONNAIRE – PSYCHOMETRIC EVALUATION**

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**Abstract:** Numerous studies speak in favour of the existent connection between the exposure to stressors, i.e. potentially stressful events and psychophysiological stress symptoms, as well as later psychopathology. However, although posttraumatic stress disorder has been defined by traumatic exposure as one of its criteria, in a series of repeated studies the correlations between measured exposure and clinical picture remain relatively low, as well as the rate of disorder development following trauma. *Aims:* The aim of the paper is to present the procedure of constructing of war stressors assessment questionnaire and its basic metric characteristics. The questionnaire covers a wide spectrum of stressors characteristic of war conflict in the former Yugoslavia to which the civilians were also exposed. *Method:* research was carried out on a sample of 238 subjects who had been exposed to war actions. In addition to the constructed questionnaire, the Impact of Event Scale – IES and Symptom Checklist-90-Revised version – SCL-90-R were applied. *Results:* By using Ward's cluster analysis method the eight categories of traumatic experience were obtained (active combat, witnessing of death or wounding, loss of organisational/military structure, war-related deprivation, injury, life in hostile surrounding, imprisonment/torture, combat exposure), and they were also verified by subsequent factor analysis. The questionnaire's subscales formed in this way have

good metric characteristics. The obtained subscales had different correlations with the results from the IES and SCL-90-R, which were taken as measure of psychopathology. *Conclusion:* The constructed questionnaire covers different aspects of traumatic experience and has good metric characteristics. Its utility is reflected in the possibility of analysis of different aspects of the complex war experiences.

**Key words:** *Stressor, posttraumatic stress disorder, questionnaire, assessment*

## Introduction

Posttraumatic stress disorder (PTSD) is nosological entity defined on the basis of several criteria, and one of the decisive factors is the exposure to traumatic “event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others<sup>1</sup>, or “stressful event or situation (either short or long-term) of exceptionally threatening or catastrophic nature, that may cause extensive suffering in almost any person”<sup>2</sup>. These events may arise as the consequence of war, natural and man-made disasters, physical and sexual violence, traffic and industrial accidents, and the like. Different aspects of disorder have been investigated with different groups, but the characteristics of traumatic events (stressors) have not been investigated that often<sup>3,4</sup>.

Numerous studies speak in favour of the existent connection between the exposure to stressors, i.e. potentially stressful events and psychophysiological stress symptoms, as well as later psychopathology. On the other hand, although PTSD has been defined by traumatic exposure as one of its criteria, in a series of repeated studies the correlations between measured exposure and clinical picture remain relatively low, as well as the rate of disorder development following trauma<sup>5</sup>. In other words, the essential correlation between the exposure to stressors and PTSD symptoms have not been substantiated, which is probably due to many other factors involved in the development of the disorder<sup>6,7,8,9</sup>. There are ongoing debates between those who believe that PTSD represents normative response (“normal reaction to abnormal events”) and those who claim that PTSD is a psychiatric disorder, which bears possible political implications<sup>5</sup>. We believe that further research is necessary into the role of traumatic events in the onset of PTSD symptoms and other disorders developing as a consequence of traumatic experiences. One of the prerequisites for this research is development of valid

instruments for measuring degree of exposure to potentially traumatic events.

The instruments measuring the exposure to different categories of stressors that do not involve war stressors were described in several papers<sup>10, 11, 12, 13</sup>. As to the studies of war stressors, the available instruments were most often constructed for Vietnam or Israeli veterans<sup>14, 15</sup>. Over the past few years, the questionnaires for assessing war stressors exposure have also been used with Gulf War survivors<sup>16, 17, 18</sup>. These questionnaires involve the usual combat experiences (being “under the enemy fire”, “surrounded by the enemy”, “witnessed killing of others”, etc.) like in the *Combat Exposure Scale* with 7 questions<sup>19</sup>; witnessing of bizarre death or mutilation (*Military Stress Scale* with 6 questions<sup>20</sup>; *Combat Exposure Index* with 7 questions<sup>21</sup>); killing of civilians (another instrument under the same name – *Combat Exposure Scale* with 7 questions<sup>22</sup>). Some questionnaires (*Vietnam Era Stress Inventory*<sup>23</sup>, *Women's Wartime Stressor Scale*<sup>24</sup>) comprise questions about unpleasant experiences in the military setting (sleep and/or food deprivation, lack of support, reproach and offences upon return home). Most of the above questionnaires represent the brief scales assessing the stressors specific to war zone and some of them have good measures of reliability (as measured by Cronbach's alpha)<sup>14</sup>. In our opinion, this could be expected for the scales measuring different traumatic events in the same traumatic situation, i.e. with high inter-item consistency, since they deal with homogenous situations in which there is a high probability that if a person experienced one stressor, he/she also experienced other stressors. Furthermore, some questionnaires are used as the lists of events and their metric characteristics have not been investigated<sup>16, 25</sup>. Only few questionnaires assess the subjective experience, i.e. emotional assessment of traumatic experience<sup>14, 26, 27</sup>. In this sense, detailed structured questionnaires are an exception<sup>28</sup>.

A special problem in assessing of stressor exposure is accuracy and authenticity of the retrospective reports provided by the subjects. The researcher's goal is to "minimize the probability that client's reports are incorrect and maximize the likelihood of the completeness of his reports"<sup>12</sup>. On the other hand, the very nature of traumatic memories probably affects the reliability of data. Memory of traumatic events is not unchangeable nor stable over time<sup>16</sup>, while the objective data (such as independent confirmation of the event by a

third party) have been rarely used in literature<sup>29</sup>. Furthermore, only few questionnaires include behaviourally specific questions. Avoiding of questions formulated in wide categories (e.g. combat, sexual abuse, etc.), and introduction of those describing behaviour in more detail, especially concerning interpersonal violence, are likely to increase the degree of accuracy<sup>11</sup>.

The stressors assessment questionnaire most commonly used with the subjects exposed to war stressors in the former Yugoslavia, which only partially covers the stressors variety, is the Harvard Trauma Questionnaire originally designed for refugees from Cambodia<sup>30, 31,32</sup>. The first part of this questionnaire consists of 17 questions and covers most war traumas, but not in a behaviourally specific way (the subject is asked whether he/she “experienced”, “witnessed”, or “heard stories” about the following events - “combat situation”, “close death”, “brain washing”). The Harvard Trauma Questionnaire does not measure the subjective assessment of event, and the answers to the questions about whether someone “heard stories” about the event are not informative at all, having in mind the circumstances related to the war in former Yugoslavia. Working with Bosnian refugees, Weine et al. constructed the Communal Traumatic Experiences Inventory<sup>33</sup> which, according to the assumption of its constructors, measures “a profile of the traumatic events experienced by the survivor of communal trauma”. The questionnaire comprises 36 questions about 30 potentially traumatic war events. The indicator of the degree of stressor exposure is calculated by simple adding up of the positive answers to items, while the psychometric characteristics of the questionnaire are not available to us. The result of this questionnaire was not related to PTSD diagnosis nor to PSDI (Positive Symptom Distress Index) values from the Symptom Checklist 90 – R<sup>34</sup>.

The war-related traumatic experiences of our patients from the Stress Clinic of the Institute of Mental Health in Belgrade and the Trauma Centre of the International Aid Network - IAN, greatly surpass the combat experiences. The reason could be found in the characteristics the war (it was a combination of the frontal combat and civil conflict with large number of unprofessional soldiers fighting at their surroundings), and in the fact that great numbers of civilians were also exposed to war stressors (killing and mistreatment of civilians of other nationality at the territories beyond the frontline, in towns and settlements; ethnic cleansing and massive resettlement of

the population; numerous camps and prisons with killing and torture being the common phenomena). The same person could have experienced suffering beyond the frontline – in urban or rural communities, prisons or camps, in active combat participation or passive exposure to combat, and all these events might have involved family members and friends. In traumatization assessment it is, therefore, very difficult to place people into the rough categories according to war experiences (refugee, soldier, civilian, camp prisoner), because their roles are interwoven and often multiple. A refugee could have experienced the combat or camp detention, witnessed killing or torture of his family members or friends, or none of these apart from already difficult experiences of exile.

The aims of our research were: 1) to construct a new questionnaire for the assessment of the degree of exposure to various war stressors categories and 2) to verify the metric characteristics of the questionnaire, that is, reliability, sample adequacy, homogeneity and validity. The requirements set up during the construction of questionnaire were as follows: 1) the instrument should cover a wide spectrum of stressors related to armed conflict, not only individual separate domains of experience (concrete combat actions, types of torture in detention camps, etc.); 2) items of the questionnaire should, to a certain level, be behaviourally specific to increase the accuracy of answers (by introducing items describing concrete behaviour or event, not categories of events); 3) individual differences in stressor reactions should be respected by introducing of the assessment of subjective stressors reaction, and 4) the position of arbitrator in determining events reality should be avoided.

### **Construction and empirical validation of psychometric characteristics of War Stressors Assessment Questionnaire**

#### **Procedure of generating and selecting of questionnaire items**

The original version of the questionnaire was constructed in 1995. In generating of items for the questionnaire we started from the assumption that stressful situation was hierarchically structured. At the lowest hierarchy level, there are behaviourally specific events

whose number is virtually infinite. The samples of these indicators have low inter-item consistency and small or almost no discrimination. The coefficients of inner congruency are low so that some authors do not recommend their calculation at all<sup>10</sup>.

The second level refers to the situation specifying the set of events (the first frontline, staying at the enemy territory, imprisonment, etc.). At this level, the assumption is that if one event from the given situation occurred, the likelihood that another also occurred is above zero. This further implies the existence of the inter-indicator congruency. Only at the third level are the roles that a person may have (active combat experience – veteran, passive combat experience – civilian, imprisonment or camp detention – prisoner, and the like).

*War Stressors Assessment Questionnaire* (WSAQ) was constructed so that it involves the second level of structuring of traumatic events related to the participation in civil war. In constructing of indicators, the following were taken into consideration:

1. the indicators should be formulated using words which the subjects themselves most commonly use;
2. the events should be possible for most people who found themselves in the specific situation or role;
3. maintaining of the sufficient level of behavioural specificity of items is necessary in order to minimize the subjectivity of answers.

The instrument is designed so that it measures the exposure to stressors *in war zone*. Therefore, the questionnaire does not include stressors of exile, pre-war stressors, or the stressors the person experienced indirectly (heard about the event from others or through media). Items of the questionnaire represent the selected statements that have been reported to us in our previous clinical work by the patients who had experienced various stressful events during the war. Specifically, the statements representing “basic categories” of stressors, i.e. a stressor description which is behaviourally specific enough to adequately determine the traumatic experience, but also includes the varieties of the experience. For example, the item “I was wounded in combat” defines the information on the physical injury inflicted in combat but does not specify the type of injury, the circumstances of wounding, etc. The questions in the questionnaire are, therefore, formulated so that they are representations of the classes of events, and due to their higher specificity, the accuracy of

answers is also expected to be higher. The responses to these items do not involve only the individual events, since they are not that relevant, but above all the degree of exposure to the *classes* of war stressful experiences.

The initial item categorization was based upon our modification of “generic stressor dimensions” model proposed by Bonnie Green, as well as on the possibility to recognize the measures of common dimension in heterogeneous events<sup>3</sup>. According to this categorization, the stressors are distributed based on the following dimensions: 1. injury; 2. life threat; 3. imprisonment; 4. witnessing of wounding or killing of others; 5. contact with the wounded and dead bodies; 6. wounding or killing of others in combat; 7. war-related deprivation; 8. loss of social/organizational structure. The final two categories have been introduced based on the patients’ reports on the importance of the role of these stressors in their subjective experience of events. The questionnaire is not ethnically specific, namely, all questions are formulated so that all survivors can provide responses regardless of their nationality or the side they took in the conflict.

The first version of the questionnaire consisted of 79 items with offered answers and two open questions. The subject gives answer to each item by choosing one of the suggested responses on two scales: the four-degree *stressor exposure scale* (0 - did not experience, 1 -experienced once, 2 - experienced several times and 3 - experienced often) and the seven-degree *scale of distress* inflicted by experienced stressor (from 0– did not distress me at all to 6 – distressed me so much that it changed my life). Two additional questions with open answers invited the subjects to describe unpleasant war events that they experienced but were not included in the questionnaire, as well as to specify the most difficult (most horrifying) event.

## **Subjects**

The sample consisted of the persons who had been exposed to war stressors during the war in Croatia and Bosnia & Herzegovina, from 1991-1995. Research included 400 subjects, among them 238 entered the final analysis after the exclusion of the subjects with incomplete data. The subjects were divided into three groups: 1. outpatients treated at the Stress Clinic of the Institute of Mental

Health; 2. inpatients treated at the Department for Neurotic and Borderline disorders, Institute of Mental Health; 3. refugees accommodated in collective centres not referred for psychiatric treatment. Inclusion criteria of research subjects were exposure to war stressors and age over 18 years at the time of stressor exposure. Exclusion criteria were diagnosis of a psychotic, bipolar, or organic mental disorder.

The subjects were between 18 and 75 years of age, with mean age 39.69 years (SD=11.88), and 12.36 years of education (SD=2.49). The larger part of the sample consisted of men (N=147; 61.8%). Most subjects were married (N=133; 55.9%). Their place of birth was Croatia (N=113; 47.5%), Bosnia and Herzegovina (N=87; 36.6%), FR Yugoslavia (N=34; 14.3%), and other (N=4; 1.6%). According to the type of subjects, they were divided as follows: refugees (N=122; 51.3%), refugees/veterans (N=84; 35.3%) and veterans (N=32; 13.4%). 116 (48.7%) subjects were outpatients, 13 (5.5%) inpatients, and 109 (45.8%) underwent no psychiatric treatment.

### Procedure and instruments

The research was carried out from 1997 to 1999. All subjects underwent the unique procedure consisting of clinical interview and filling-in of the self-assessment questionnaires. The research was performed in two phases: 1) the first phase consisted of psychiatric clinical interview. Psychiatric examination was needed to confirm if the subject fulfilled the inclusion criteria for research, as well as the existence of specific symptoms sufficient to make clinical diagnosis of psychiatric disorder. Diagnoses were made according to DSM-IV criteria<sup>1</sup>. The second phase consisted of the use of diagnostic and assessment questionnaires. All subjects signed the informed consent.

In addition to *War Stressors Assessment Questionnaire (WSAQ)*, the following instruments were used:

Socio-demographic interview designed as structured interview to be filled in by the investigator, including basic socio-demographic characteristics, as well as data concerning military involvement, injuries or wounding, exile, and personal and family history. Impact of Event Scale – IES<sup>35</sup> and Symptom Checklist-90-Revised version–SCL-90-R<sup>36</sup> were also used.



## **Data analysis**

The Statistical Package for Social Sciences - SPSS version 8 and RTT10G macro program designed by G. Knezevic and K. Momirovic<sup>37</sup> were used for data analysis. The standard procedures of sample description were used (means, standard deviations and frequencies), as well as cluster analysis, factor analysis and the standard methods for the assessment of questionnaire's metric characteristics (Cronbach's alpha coefficient, Kaiser-Meyer-Olkin measure of sample adequacy, Momirovic's measure of homogeneity).

## **Results**

### ***Construction of exposure scales to specific categories of war stressors on the basis of grouping of the subjects' answers***

In order to make the picture of the war stressors the subject was exposed to, obtained by the use of the *War Stressors Assessment Questionnaire*, as complete as possible and clinically applicable, we decided to try to define the indicators of exposure to the specific war stressors categories. Instead of *a priori* theoretical war stressors categories we empirically determined the modalities of war traumatic events, i.e. war stressor categories, by grouping into the same category with cluster analysis the events that most often occurred together in the war experiences of our subjects. Therefore, the answers of 238 subjects to 79 questionnaire items were standardised and normalised, and after that, Ward's method of hierarchical cluster analysis with items as variables was applied to thus transformed results. The solution obtained by this procedure was empirically and theoretically acceptable.

On the basis of consistency in grouping items into clusters in the classifications with different number of clusters, and of the contents of items constituting the clusters, we defined eight categories of war traumatic experience (six clusters were extremely homogenous while the final two consisted of somewhat more heterogeneous items). From the set of items belonging to the same cluster, i.e. the same

category of experience, we eliminated the items similar to their contents, i.e. redundant items, as well as the items that were formulated too generally. Of 79 items that entered the analysis of exposure to specific categories of war stressors, 61 items remained. Table 1 shows distribution of these items according to clusters.

**Table 1. Subscales of War Stressors Assessment Questionnaire constructed by grouping of items into clusters (N=238)**

Cluster	Scale items
<b>Cluster 1</b> Active combat	<b>58*. I saw that I shot an enemy soldier.**</b> 24. I killed an enemy soldier in a "hand-to-hand" combat. 19. I took part in "cleansing of the field". 31. I took part in street fighting. 2. I took an enemy soldier for prisoner. 30. I took part in "hand-to-hand fighting". 61. I took part in escorting or guarding of enemy prisoners.
<b>Cluster 2</b> Witnessing of death or wounding	64. I saw maimed (mutilated) corpses. 71. A man was killed right in front of me. 39. I saw a person being heavily wounded by a shell/mine. 12. A man beside me was seriously wounded in action. 76. I saw corpses of enemy soldiers, after the battle in which I had participated. <b>62. During fighting, I took out a wounded person.**</b> 6. I took out or carried dead soldiers. 34. I saw dead civilians, after the battle in which I participated.
<b>Cluster 3</b> Loss of organizational /military structure	<b>56. Due to a commanding error, some people from my unit were wounded or killed.**</b> 78. Some people from my unit were wounded or killed because we were betrayed. 52. We had to retreat when it was not justified at all. 26. A part of my combat unit deserted. 27. In action, I run out of ammunition. 18. I found myself alone in action. 23. I fell into the enemy ambush. 57. I refused an irrational order.
<b>Cluster 4</b> War-related deprivation	53. I spent a night in the open air, under rain or in water. <b>77. I slept in the open air, with temperature below zero.**</b> 67. We lost link with the command post. 9. I could not leave the frontline for more than a month. 11. A friend of mine was seriously wounded or killed right in front of me. 69. I was forced to long marches or hard labour. 8. Sometimes, I did not eat anything for 48 hours. 54. Sometimes, I did not sleep for 24 hours

**Table 1. (continued) Subscales of War Stressors Assessment Questionnaire constructed by grouping of items into clusters (N=238)**

<b>Cluster</b>	<b>Scale items</b>
<b>Cluster 5</b> Injury	3. I was wounded in action.  <b>47. I was taken to hospital because of the wound(s) I have got in war.**</b> 44. I was wounded in a shelling. 48. I lost a part of the body in war.
<b>Cluster 6</b> Life in hostile surrounding	25. I was used as "human shield".  36. The enemy forced me to work on the frontline. 79. I was abused or humiliated by some of our people. 5. I did not have any news on my family for a long time. 42. I could not see my family for more than a month. 38. It happened that my closest neighbours openly expressed hostility towards me. <b>29. In trouble, I was not helped out even by those whom I expected would help me.**</b> 59. Enemy soldiers broke into my apartment or checked out my documents during roundups.
<b>Cluster 7</b> Imprisonment/torture	60. While in captivity, I watched other people being abused and tortured.  <b>66. In war, I was physically abused and tortured.**</b> 75. I was held prisoner in a camp or a "private prison". 50. While in captivity, I was held in a single cell. 73. While in captivity, I was forced to hard labour. 68. I was sexually abused in war. 74. I came to know that a member of my family had been physically or sexually abused. 35. While in captivity, I watched other people being sexually abused. 43. While in captivity, I watched members of my family being abused and tortured. 51. While in captivity, I saw other people being killed.
<b>Cluster 8</b> Combat exposure	1. We were surrounded by the enemy forces.  <b>7. I saw a mutilated dead child.**</b> 14. We were surprised by enemy attack. 15. I drifted into a minefield. 16. A shell exploded close to me. 17. A bullet just passed me by. 46. I saw a child being seriously wounded or killed 63. I carried a seriously wounded woman or a child.

\* Ordinal number before items correspond to the numbers from the War Stressors Assessment Questionnaire

\*\* The most representative item in the subscale

Eight subscales of the exposure to different categories of stressors were created based on the results of cluster analysis. At the same time, the subjects' answers concerning the frequency of the exposure to specific war traumatic events, originally on a three-degree

scale (0-did not experience, 1-experienced once, 2-experienced several times and 3-experienced often) were binarised (1-experienced, 0-did not experience). This transformation was carried out since it did not change the relative position of the subjects in regard to the degree of stressor exposure, and would facilitate answering in future use of the questionnaire. The total scores of the degree of exposure to specific stressor categories as well as of the total exposure to war stressors were obtained by summation of answers from thus transformed scales.

Factor analysis was also applied so that the establishing of specific categories of war stressors based on the grouping of items through cluster analysis, as well as defining of the scales of exposure to these stressors categories, could be additionally validated on questionnaire's items as variables. The factors were extracted by the main component analysis. Eight factors were kept according to *a priori* criterion based on the results of cluster analysis. These factors were rotated with the use of Kaiser promax criterion and the factors scores obtained in this way were calculated with the use of regression procedure.

**Table 2. Matrix of the first eight factors extracted from *War Stressors Assessment Questionnaire* items obtained by the main components analysis with Promax rotation\* (N=238)**

Item	Factor							
	1	2	3	4	5	6	7	8
58. I saw that I shot an enemy soldier.	.99							
24. I killed an enemy soldier in a "hand-to-hand" combat.	.95							
30. I took part in "hand-to-hand fighting".	.89							
2. I took an enemy soldier for prisoner.	.87							
76. I saw corpses of enemy soldiers, after the battle in which I had participated.	.86							
31. I took part in street fighting.	.84							
61. I took part in escorting or guarding of enemy prisoners.	.79							
6. I took out or carried dead soldiers.	.73							
19. I took part in "cleansing of the field".	.67							
62. During fighting, I took out a wounded person.	.60							
12. A man beside me was seriously wounded in action.	.52		.32					
34. I saw dead civilians, after the battle in which I participated.	.52							
64. I saw maimed (mutilated) corpses.	.46					.39		
67. We lost link with the command post.	.43		.35					
71. A man was killed right in front of me.	.43					.31		

\*Note: Only the coefficients with absolute value over 0.30 are presented in Table.

**Table 2 (continued). Matrix of the first eight factors extracted from *War Stressors Assessment Questionnaire* items obtained by the main components analysis with Promax rotation\* (N=238)**

Item	Factor								
59. Enemy soldiers broke into my apartment or checked out my documents during roundups.	-.33							.31	
11. A friend of mine was seriously wounded or killed right in front of me.									
75. I was held prisoner in a camp or a "private prison".		.87							
66. In war, I was physically abused and tortured.		.86							
60. While in captivity, I watched other people being abused and tortured.		.85							
51. While in captivity, I saw other people being killed.		.84				-.30			
73. While in captivity, I was forced to hard labour.		.80							
35. While in captivity, I watched other people being sexually abused.		.80							
50. While in captivity, I was held in a single cell.		.75							
43. While in captivity, I watched members of my family being abused and tortured.		.73							
68. I was sexually abused in war.		.52				-.34			
56. Due to a commanding error, some people from my unit were wounded or killed.				.94					
57. I refused an irrational order.	.38		.53						
27. In action, I run out of ammunition.	.32		.38						
77. I slept in the open air, with temperature below zero.									
23. I fell into the enemy ambush.									
69. I was forced to long marches or hard labour.									
16. A shell exploded close to me.				.86					
54. Sometimes, I did not sleep for 24 hours.				.67					
1. We were surrounded by the enemy forces.				.66					
14. We were surprised by enemy attack.			.37	.65					
8. Sometimes, I did not eat anything for 48 hours.				.57					
17. A bullet just passed me by.				.55					
9. I could not leave the frontline for more than a month.			.33	.40					
53. I spent a night in the open air, under rain or in water.	.34			.36					
15. I drifted into a minefield.									
47. I was taken to hospital because of the wound(s) I have got in war.				.82					
3. I was wounded in action.				.82					
48. I lost a part of the body in war.				.73					
44. I was wounded in a shelling.				.61					
46. I saw a child being seriously wounded or killed.						.78			
7. I saw a mutilated dead child.						.69			
63. I carried a seriously wounded woman or a child.	.32					.63			

*\*Note: Only the coefficients with absolute value over 0.30 are presented in Table.*

**Table 2 (continued). Matrix of the first eight factors extracted from War Stressors Assessment Questionnaire items obtained by the main components analysis with Promax rotation\* (N=238)**

Item	Factor							
39. I saw a person being heavily wounded by a shell/mine.						.39		
79. I was abused or humiliated by some of our people.			.30				.60	
29. In trouble, I was not helped out even by those whom I expected would help me.							.60	
5. I did not have any news on my family for a long time.							.55	
38. It happened that my closest neighbours openly expressed hostility towards me.							.53	
42. I could not see my family for more than a month.	.39			.34			.43	
25. I was used as "human shield".							.40	.40
74. I came to know that a member of my family had been physically or sexually abused.			.35				.37	
36. The enemy forced me to work on the frontline.	-.30							.67

\*Note: Only the coefficients with absolute value over 0.30 are presented in Table.

As can be seen from the matrix design presented in Table 2, the results of factor analysis gave very similar results to those obtained by cluster analysis. The additional verification of this conclusion is the existence of high coefficients of linear correlation between the specific factor scores obtained by factor analysis and the total scores on the corresponding scales obtained by grouping of items with the use of cluster analysis (Table 3).

**Table 3. Matrix of correlations between total results on stressor exposure scales (E1 to E8) and the first eight factors obtained by factor analysis of items from War Stressor Assessment Questionnaire (N=238)**

	E1 Active combat	E2 Witness- ing of death or woun- ding	E3 Loss of organis- ational/ military structure	E4 War- related depriva- tion	E5 Injury	E6 Life in hostile surrou- nding	E7 Impris- onment/ torture	E8 Combat exoposu- re
Factor 1	.95	.86	.70	.72	.41	.23	.26	.63
Factor 8	.11	.41	.19	.33	.01	.31	.13	.20
Factor 3	.60	.73	.94	.73	.42	.34	.36	.60
Factor 4	.56	.66	.60	.83	.34	.40	.36	.81
Factor 5	.40	.32	.41	.40	.94	.26	.24	.35
Factor 7	-.01	-.12	.03	.01	.05	.77	.36	.07
Factor 2	.31	.43	.38	.51	.28	.57	.97	.39
Factor 6	.36	.43	.29	.28	.21	.24	.27	.59

As can be seen from Table 3 in the first, second, third, fourth, sixth and seventh factor there is a high correlation between the factor scores and the scores obtained by summation of answers in the groups of items obtained by cluster analysis. Lower correlations were obtained for clusters where there is a larger distance between indicators.

The results indicated that most of the defined modalities were invariant to the technique by which the grouping was performed, as well as to different transformations of unprocessed results. In this way and based on binarised answers concerning the exposure to specific traumatic war events, the scales of exposure were defined for following war stressors categories: active combat, witnessing of death or wounding, loss of organisational/military structure, war-related deprivation, injury, life in hostile surrounding, imprisonment/torture, combat exposure.

For each of the above categories of war stressors, in addition to exposure scales, the corresponding scales of distress by the events from the given stressor categories were defined. The scores on distress scales are obtained by simple adding up of the subjects' answers in a seven-degree distress scale, about how distressing the certain event was for the subject. This paper will only present the psychometric characteristics of the exposure scales, while the review of psychometric properties of the accompanying distress scales, as well as their relations to the exposure scales, will be the subject of a separate paper.

### **Psychometric characteristics of the scales of war stressors exposure**

The indicators of internal metric characteristics of the scales of war stressors exposure (reliability – Cronbach's alpha-coefficient, sample adequacy – Kaiser-Meyer-Olkin measure, the participation of the first main component in the total variance, homogeneity – Momirovic's measure of homogeneity H2) are presented in Table 4.

**Table 4. Indicators of reliability, sample adequacy, homogeneity of subscales of exposure to war stressors formed by cluster analysis of items from *War Stressor Assessment Questionnaire* (N=238)**

Subscale (Number of items)	Reliability (Crombach Alfa- coefficient		Sample adequacy (Kaiser-Meyer- Olkin)		Percentage of Variance explained by the first main component		Measure of homogeneity H2***	
	SNIS *	BIS**	SNIS	BIS	SNIS	BIS	SNIS	BIS
Active combat (7)	0.92	0.90	0.89	0.88	68.0	62.6	0.92	0.91
Witnessing of death or wounding (8)	0.93	0.92	0.92	0.92	68.0	63.1	0.94	0.94
Loss of organizational / military structure (8)	0.87	0.85	0.88	0.86	52.6	49.3	0.89	0.88
War-related deprivation (8)	0.89	0.87	0.89	0.89	56.9	52.6	0.91	0.91
Injury (4)	0.80	0.78	0.74	0.73	63.1	60.8	0.92	0.90
Life in hostile surrounding (8)	0.72	0.68	0.75	0.71	34.0	31.1	0.76	0.71
Imprisonment/ torture (10)	0.89	0.88	0.89	0.88	52.1	50.3	0.86	0.85
Combat exposure (8)	0.83	0.78	0.80	0.76	45.2	39.4	0.77	0.69

\*SNIS - the total score on the scales is the sum of standardised and normalised item scores.

\*\* BIS - the total score on the scales is the sum of binarised item scores.

\*\*\* Momirovic's homogeneity test represents the contribution of the first main component of variables projected into image space in a common variance.

All subscales possess satisfactory metric characteristics for this type of scales. A high convergence of indicators, which is in the basis of all indicators of psychometric properties of the scales, proves the hypothesis about generic properties of stressors: in contrast to civilian stressors which are stochastic (accidental) by their nature and, therefore, non-congruent, war stressors are grouped into clusters arising from the participant's role and situation. Furthermore, the coefficients of reliability presented in Table 4 indicate that binarisation of item answers, that is, their transformation into the



categories: “did not experience” and “experienced” does not result in a significant disruption of metric characteristics of subscales.

The next property, and perhaps the most significant among the psychometric properties, is the construct validity of subscales. As indicators of construct validity of subscales, the correlations were used between the scores obtained by binarised items and variables obtained by instruments measuring posttraumatic symptoms (IES) or psychiatric symptoms in general (SCL-90-R). The values obtained with the use of these instruments on the described sample are presented in Table 5.

**Table 5. Values of the main indicators on SCL-90-R and IES as a measure of posttraumatic psychopathology (N=238)**

	Mean value	Standard deviation
GSI <sup>1</sup>	1.55	0.87
PSDI <sup>2</sup>	2.21	0.69
IES_intr <sup>3</sup>	19.57	11.36
IES_avoid <sup>4</sup>	21.24	11.08
IES <sup>5</sup>	40.81	21.09

<sup>1</sup>GSI - Global Severity Index of the SCL-90-R

<sup>2</sup>PSDI - Positive Symptom Distress Index of the SCL-90-R

<sup>3</sup>IES\_intr - the total result on intrusion subscale of the IES

<sup>4</sup>IES\_avoid - the total result on avoidance subscale of the IES

<sup>5</sup>IES - the total result of the IES

The correlations between the scores on subscales of the *War Stressors Assessment Questionnaire* and clinically relevant variables from the IES and SCL-90-R are presented in Table 6.

**Table 6. Correlations between the scores on war stressors exposure scales (E1 to E8) and measures of posttraumatic psychopathology (N=238)**

	PTSD <sup>1</sup>	GSI <sup>2</sup>	PSDI <sup>3</sup>	IES_intr <sup>4</sup>	IES_avoid <sup>5</sup>
E1 Active combat	.36***	.16*	.17**	.17**	.21**
E2 Witnessing of death or wounding	.41***	.17**	.19**	.21**	.24***
E3 Loss of organisational/military structure	.39***	.24***	.27***	.25***	.20**
E4 War-related deprivation	.48***	.22***	.22***	.25***	.28***
E5 Injury	.25***	.14*	.19**	.10	.11
E6 Life in hostile surrounding	.34***	.27***	.27***	.26***	.25***
E7 Imprisonment/torture	.50***	.35***	.31***	.26***	.22***
E8 Combat exposure	.39***	.24***	.24***	.26***	.28***

\*p&lt;0.05; \*\*p&lt;0.01; \*\*\*p&lt;0.001

<sup>1</sup> PTSD = PTSD diagnosis established by clinical interview;<sup>2</sup> GSI = Global Severity Index of SCL-90-R;<sup>3</sup> PSDI = Positive Symptom Distress Index of SCL - 90-R;<sup>4</sup> IES\_intr = the total score on intrusion subscale of Impact of Event Scale;<sup>5</sup> IES\_avoid = the total score on avoidance subscale of Impact of Event Scale.

Most subscales have statistically significant correlations with the specific indicators of psychopathology, which are, in any case, considered the psychological consequences of stressors exposure. Moreover, the coefficients of correlations between the specific exposure scales and the measures of posttraumatic symptoms are somewhat higher than those usually found in literature about the relationship between the stressors exposure and the adverse posttraumatic psychological consequences.

## Discussion

Psychometric characteristics of the scales of the exposure to different war stressors categories, constituting the integral part of the *War Stressors Assessment Questionnaire*, are comparable to the scales from the introduction herein. Development of scales based on cluster analysis proved to be psychometrically justified and in our opinion,

clinically useful since thus separated scales can address different categories of war experiences.

Heterogeneity, as well as overlapping of different traumatic experiences, leads to a much more complex picture of war experiences. Therefore, two close stressor categories E1-*active combat* and E8 – *combat exposure* differ not only in regard to traumatic situation, but also to the role of the subject. The first subscale suggests that the subject participated in the combat, i.e. shooting, coming into direct armed contact with the enemy, probably wounding or killing the enemy. As can be seen in Table 3, factor 1 (composed of the majority of items related to active combat experiences) correlates with all subscales of war stressors exposure, suggesting that most of these experiences are related to the war in a narrow sense, that is, to combat. However, scales five, 6, 7 and 8 (E5 - *injury*, E6 – *life in hostile surrounding*, E7 - *imprisonment/torture*, E8 – *combat exposure*), correlate to a lesser extent to factor 1, suggesting that these experiences might have occurred independently from combat participation, that is, to civilians (e.g. in a besieged town). We believe that, although most experiences could have been simplified, the knowledge of a wider context of the experience is necessary in order to get a more adequate traumatization picture. For instance, whether witnessing of death or wounding was related only to the frontline in veterans, life in hostile surrounding or, perhaps, to experience of camp detention.

The results presented in Table 4 indicate that the correlations between the subscales and PTSD diagnosis established by clinical interview are significantly more manifest than the correlations between the results of the exposure scales and other measures of posttraumatic psychopathology. This phenomenon could be explained by the tendency of investigator to make diagnosis of PTSD if DSM-IV criterion A has been fulfilled (exposure to “event or events that involve actual or threatened death or serious injury, or a threat to the physical integrity of self or others”), irrespective of the severity of psychopathology or the number of PTSD symptoms. This certainly makes us think of the character of psychopathology developing after traumatic experience that fulfils criterion A, when the clinical picture itself is not sufficient to establish PTSD diagnosis<sup>25</sup>.

The highest correlations with the measures of psychopathology are found in the subscale assessing the degree of exposure to camp and torture experiences, which is expected and

corresponds to the findings that the experience of torture is one of the most important predictive factors for the development of PTSD<sup>38, 39</sup>. The lowest correlations are obtained for injuries, which corresponds to our earlier findings<sup>40</sup>. This suggests two possibilities: a) personal physical injury does not significantly participate in the dynamics of disorder development, or b) personal injury leads to combat withdrawal and accompanying reduction of exposure to stressors. However, one surprising result was also obtained indicating that the active combat exposure does not correlate with most measures of psychopathology, except with avoidance measured by the IES. This result implies that the active role during the course of traumatic event might have negative correlation with the psychopathology.

High correlations were obtained for subscales, which are supposed to measure war-related deprivation and the loss of organisational or military structure. If we look at the subscales classified according to the degree of their correlation with psychopathology, we shall notice that there is a high correlation for the subscales in which the subject's role is extremely passive, such as imprisonment/torture, life in hostile surrounding, loss of structure, deprivation and combat exposure (justifying the separation of this subscale from the subscale of active combat). It is possible that this finding has universal significance, since it is easy to recognize the signs of destructive effect of the very same mechanism of the loss of control over supporting contingencies as in learned helplessness. However, when we consider the above-mentioned correlations between the types of stress and psychopathology, we should also bear in mind the heterogeneity of the sample on which the analyses have been performed. It is possible, for example, that the subjects significantly differ in some of the variables related to personality dimensions, which could be responsible for different correlations of the types of stressful events<sup>41</sup>. This conclusion requires additional empirical validation since it may have significant implications.

The analyses related to the distress scales from the *War Stressors Assessment Questionnaire* and the relationship between the distress scales (subjective reactions to experienced stressors) and the exposure and psychopathology, due to their extent and complexity, will be the subject of a separate paper.

## Conclusion

Measurement of war stressors requires instruments that would be more sensitive to specificity of the context surrounding particular traumatic events. Our *War Stressors Assessment Questionnaire* covers a wide spectrum of complex traumatic experiences which are different concerning some of their characteristics, and which sometimes occur together. The obtained results support the assumption that war traumatic events are more structured than civilian traumatic events.

Statistical analysis has indicated that the subscales of the exposure to specific categories of war stressors, which are integral part of the *War Stressors Assessment Questionnaire*, have good metric characteristics and are clinically applicable. Differences in the correlations between the subscales of stressors and the measures of psychopathology suggest the complexity of interaction between the original trauma and a consequent psychiatric disorder.

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