Psychosomatic and Depressive Symptoms in Civilians, Refugees, and Soldiers: 1993-2004 Longitudinal Study in Croatia

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Aim
To evaluate psychosomatic complaints and depressive symptoms among civilians, refugees, and soldiers in the war and post-war period in Croatia.

Method
The design of the study was longitudinal, including four repeated assessments during the war and post-war period (1993, 1995, 2000, and 2004). The baseline assessment included 480 male participants who were asked to fill out the questionnaires about demographic data, psychosomatic complaints, and depressive symptoms. The final sample included 128 civilians, 88 refugees, and 70 soldiers, who were interviewed at all assessment time points.

Results
Levels of psychosomatic and depressive symptoms changed with time. Refugees showed the highest level of depressive symptoms in general (F=4.17, P=0.016). Psychosomatic complaints were dominant in soldiers and refugees at all assessment time points (F=210.30, P<0.001). Soldiers showed a significant increase in psychosomatic complaints with time, whereas refugees showed a decrease. Contrary to these findings, civilians showed relatively low level of psychosomatic complaints and did not show any significant changes with time.

Conclusion
It seems that for refugees and soldiers, prolonged stressful situation has long-term health implications primarily related to the psychosomatic complaints.

The consequences of exposure to war stress on mental health have been extensively examined and documented in various segments of the affected population, including soldiers (1-3), war veterans (4-9), displaced persons (10-13), and refugees (14-17). Besides the posttraumatic stress disorder, anxiety, depression, and psychosomatic complaints have been identified as the most frequent psychopathological consequences of the exposure to stressors related to combat (18-22) and forced displacement (13,23,24). For example, a high number of psychosomatic complaints was found in Israeli combat veterans with combat stress reactions (21). Among Croatian war veterans, depression is one of the most prevalent diagnoses and the most common disorder comorbid to PTSD (25). Similarly, an increased number of depressive symptoms has consistently been found in a considerable proportion of displaced persons both shortly after the exile (13) and several years later (17,23).

Presumably, the uncontrollable nature of combat and forced displacement can lead to the perception of loss of personal control and, consequently, to a feeling of helplessness and other symptoms of depression (17,26-28). The stressors impacting these groups after the end of the war (e.g. demobilization and unemployment for veterans, and return to the devastated and land-minded home area for displaced people) only add to the
The detrimental effects of their exposure to war stressors. These cumulative effects are usually considered to be an explanation for relatively high rate of various, often multifaceted mental health problems found in these groups in some of the recent studies (12,25). The participants in these studies were often preselected because they sought an expert evaluation of their current mental health status (25) or they were previously diagnosed and received some kind of medical treatment (29-31). Hence, the results of these studies cannot easily be generalized to the non-psychiatric population of veterans and the parts of the general population without combat experience. Furthermore, few studies have analyzed the longitudinal change and stability of problems induced by war stress, and when such an analysis was performed, it was aimed at evaluating a therapeutic program long after the war stress experience (30,32). However, to assess the long-term course of the psychopathologies caused by war, findings of longitudinal surveys may be more relevant. Such longitudinal data were used in this follow-up study on depressive symptoms and psychosomatic complaints of Croatian soldiers and refugees, as well as civilians, whose exposure to war stressors was mainly indirect.

The aim of this study was to address the long term psychological consequences of the exposure to various war stressors, both those directly related to combat and displacement, and indirect stressors, confronted by residents of cities which were not actually attacked during the war. It was expected that more directly exposed groups (soldiers and refugees) would have more depressive symptoms and psychosomatic complaints than the group of civilians, who were indirectly exposed to war stressors. Also, with time, a general decline in the severity of these problems was expected, particularly in the latter group. To test these hypotheses, three groups of men were recruited in 1993 (a war year) and asked to fill out questionnaires on depressive symptoms and psychosomatic complaints. The same questionnaires were administered to them in 1995, immediately after the end of the war, and again in 2000 and 2004, 7 and 10 years after the first assessment. Thus, the study was a ten-year follow-up of three groups from the male population of Croatia, exposed to various types of war stress but not medically treated for mental health disturbances at the time of study recruitment.

Participants and Methods

Participants

The baseline assessment included a sample of 480 participants (Fig. 1); 160 civilians, 160 refugees, and 160 soldiers. To reduce the heterogeneity of the results within each group regarding demographic characteristics and traumatic experiences, and possible bias, several inclusion criteria were defined. Women were not included because the soldier population was predominantly male. The participants had no history of psychiatric disorder and pharmacological medication. The civilians were permanent residents of the city of Split. They were without combat or refugee experience, but were exposed to a constant threat of war stressors such as possible bombing attacks and air raids. All refugees participating in the study were accommodated in refugee camps. The majority of the refugees were from the occupied region of Benkovac, and others from eastern Slavonia and other regions. The group of soldiers consisted of professional and mobilized soldiers from the same military branches and units, with at least six months front line combat experience. Participation in the study was voluntary.

At the last assessment, there were 286 participants (Fig. 1). Approximately 40% of subjects who were available at the first assessment dropped out from the study. The main reasons for the lost of participants were: unknown address (50%), death (10%), non-compliance (5%), missing (5%), emigration (10%), and other (20%). The largest number of dropout participants was in the soldiers group, with the greatest number of dropouts because of unknown addresses or non-compliance. Thus, the final sample of participants included 128 civilians, 88 refugees, and 70 soldiers. The available data from the final assessment showed that 80% of refugees returned to their homes and 70% of soldiers were demobilized after the end of the war.

At the time of the last assessment (n = 286), the average age (±standard deviation) was 36±7.8 years. Also, 55% of the subjects were married and 51% had children. There was no statistically significant difference between the groups in their marital status ($\chi^2 = 1.02, P = 0.399$), age
F = 0.56, P = 0.428, and the number of children (χ² = 0.68, P = 0.046). Also, there were no significant differences in psychosomatic complaints (F = 1.06, P = 0.652) and depressive symptoms (F = 0.75, P = 0.527) between the drop out sample and the final sample of participants at the first assessment point. These results suggested that drop out factors did not affect the relevant dependent variables.

**Study Design and Procedure**

The study was an observational follow-up with four repeated assessments. The baseline assessment took place in autumn of 1993 – the war year. The second assessment followed in autumn of 1995, immediately after the end of the war. For the refugees, the latter was marked by problems related to returning to their destroyed and landmined homes and land; whereas soldiers were facing the problems of demobilization and unemployment. The third assessment was carried out five years later (in 2000), and the last assessment in the first half of 2004. All assessments were performed in medium size groups (15 to 30 subjects).

**Measures**

All participants answered the series of questionnaires about demographic data (age, children, marital status), psychosomatic complaints, and depressive symptoms.

Psychosomatic complaints were assessed using the psychosomatic checklist by Vizek-Vidović (33). This is a self-report scale consisting of 25 items, which describes a variety of psychosomatic symptoms. The subject assessed the frequency of different complaints on a three-point scale (not at all, rarely, and frequently). The factor analysis applied on the results of our sample (first assessment, all groups) revealed a single independent factor, suggesting the unidimensionality of psychosomatic complaints (exploratory principal factor analysis, communalities = R², Kaiser-Guttman criterion for significant factors). The factor structure of the psychosomatic complaints questionnaire was similar (unidimensional) for the samples of civilians, refugees, and soldiers (congruency coefficients between factors varied between 0.81-0.9). The internal consistency (Cronbach’s α) for this measure on the whole sample was 0.69, ranging from 0.68 for civilians to 0.72 for refugees. Despite relatively low internal consistency, this questionnaire could be applied for investigation purposes, although with some caution in interpretation. Therefore, the sum of scores on each item was interpreted as a general level of psychosomatic complaints (theoretical range 25-75).

Depression symptoms were assessed using the Croatian version of Beck’s Depression Inventory (BDI). BDI was used to measure the current self-reported symptoms of depression (34). Each of the 21 items of BDI measures the existence and severity of the symptoms of depression by self-rating from 0 to 3. Construct validity was documented by a unidimensional factor structure, with all items loading on a single factor. The internal consistency reliability for the BDI was 0.85 and the general level of depressive symptoms was computed as an additive linear combination (sum of scores on each item). Theoretical results on this scale were in the 0-63 range. The score 0-4 indicated normal level of depression, 5-7 minimal depression, 8-11 mild-moderate depression, 11-15...
moderate-to-severe depression, and 16+ severe depression.

**Statistical Analysis**

To evaluate possible group differences across four assessment points, descriptive statistics and analysis of variance (repeated measures ANOVA) were performed. Design for statistical analysis was a two-way ANOVA (3 groups × 4 periods) with repeated measures on one factor. Also, a posteriori Duncan test for testing specific differences between groups and time periods was applied. All the collected data were analyzed using the STATISTICA statistical software package, version 6 (StatSoft, Inc. 2001, Tulsa, OK, USA).

**Results**

Generally, the highest levels of depressive symptoms and psychosomatic complaints were observed in the group of refugees (Table 1, and Table 2). ANOVA showed statistically significant differences in depressive symptoms (F = 4.17, P = 0.016) and psychosomatic complaints (F = 210.30, P < 0.001) among civilians, refugees, and soldiers. Relatively high levels of psychosomatic complaints were also observed in the group of soldiers, but their levels of depressive symptoms did not statistically differ from those of civilians. As could be expected, civilians showed the lowest level of psychosomatic complaints.

**Changes of Psychosomatic Complaints with Time**

The soldiers showed a significant increase in psychosomatic complaints with time, especially in 1995 and 2004 (F = 3.9, P = 0.008). A posteriori Duncan test for psychosomatic complaints showed significant changes with time in refugees and soldiers (Table 1). The results also showed significant changes in psychosomatic complaints with time for the refugee sample. In comparison with soldiers, psychosomatic complaints tended to decrease with time. The lowest level of psychosomatic complaints in the refugee group was found in 2004. Contrary to this, civilians did not show any significant changes with time.

**Table 1.** Descriptive statistics of psychosomatic complaints and a posteriori comparisons among assessment time points

<table>
<thead>
<tr>
<th>Subjects (n=128)</th>
<th>Year</th>
<th>Score* (mean±standard deviation)</th>
<th>1995</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilians</td>
<td>1993</td>
<td>34.02±5.64</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>33.94±5.69</td>
<td>–</td>
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<tr>
<td></td>
<td>2000</td>
<td>33.94±6.54</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>33.96±5.45</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Refugees (n=88)</td>
<td>1993</td>
<td>40.24±3.47</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>40.42±3.67</td>
<td>–</td>
<td>0.026</td>
<td>0.007</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>39.66±3.93</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>39.55±3.87</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Soldiers (n=70)</td>
<td>1993</td>
<td>37.07±3.57</td>
<td>0.011</td>
<td>0.024</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>38.43±3.43</td>
<td>–</td>
<td>–</td>
<td>0.011</td>
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<tr>
<td></td>
<td>2000</td>
<td>38.02±3.13</td>
<td>–</td>
<td>–</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>41.45±4.50</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*Psychosomatic complaints checklist (33). †Significant probabilities only, repeated measures ANOVA.

**Table 2.** Descriptive statistics of depressive symptoms and a posteriori comparisons among assessment time points

<table>
<thead>
<tr>
<th>Subjects (n=128)</th>
<th>Year</th>
<th>Score* (mean±standard deviation)</th>
<th>1995</th>
<th>2000</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civilians</td>
<td>1993</td>
<td>4.98±3.37</td>
<td>0.049</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>4.04±3.50</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>4.41±3.81</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>4.59±3.79</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Refugees (n=88)</td>
<td>1993</td>
<td>5.16±3.31</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>5.78±2.96</td>
<td>–</td>
<td>0.047</td>
<td>0.048</td>
</tr>
<tr>
<td></td>
<td>2000</td>
<td>4.71±3.42</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>4.69±3.18</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Soldiers (n=70)</td>
<td>1993</td>
<td>3.54±1.79</td>
<td>0.030</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>1995</td>
<td>4.95±2.88</td>
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<tr>
<td></td>
<td>2000</td>
<td>3.94±2.72</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>2004</td>
<td>4.67±2.99</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*The Beck depression inventory (34). †Significant probabilities only, repeated measures ANOVA.
Changes of Depressive Symptoms with Time

The refugees showed the highest level of depressive symptoms at the first assessment point (Table 2). There was a significant decrease in depressive symptoms in refugees over the follow up. Specific changes occurred in 1995, when the level of depressive symptoms was highest among soldiers and refugees. Contrary to this, civilians showed the highest level of depressive symptoms at the first assessment, in 1993.

Correlations between psychosomatic complaints and depressive symptoms in civilians, refugees, and soldiers (0.28 < r < 0.65) were statistically significant, except in soldiers in 2004. These results indicated the existence of psychosomatic problems on the general level, ie participants who exhibited higher level of psychosomatic complaints also showed higher level of depressive symptoms. Furthermore, correlations of psychosomatic and depressive symptoms between different assessment time points (0.04 < r < 0.98) suggested the stability of psychosomatic problems over 11 years of the follow up, whereas depressive symptoms showed stability over a shorter time period of 2-5 years.

Discussion

The results of this study showed that refugees exhibited higher level of psychosomatic and depressive symptoms than soldiers and other civilians. The average score on Beck's Depression inventory indicated an increased level of depressive symptoms in the whole sample, but still within the range of normal and minimal depression (34). Furthermore, an increased level of psychosomatic complaints was found in the whole sample in comparison with “normal” population (33). With time, a significant increase in psychosomatic symptoms was found among soldiers who were exposed to the highest level of stress, ie combat. Civilians expressed lower level of psychosomatic complaints than other groups at all assessment points. It seems that there were no significant long-term consequences of war on the psychological health of civilians. When compared with soldiers, civilians reported an unexpectedly high level of depressive symptoms during the war (1993). Although the number and degree of traumatic events may be lower among civilians, the presence of significant depressive symptoms could be the result of passivity, helplessness, and loss of control during the war period (35). On the other hand, refugees showed high number of psychosomatic complaints at all time points and high level of depressive symptoms during and immediately after the war. Soldiers also exhibited the highest level of depressive symptoms immediately after the war. It seems that prolonged stressful situation for refugees (return to destroyed homes, land-mines, financial hardship, and job problems) and soldiers (demobilization, and transition from military to civilian life) could be a reasonable explanation of these findings. These results are partly supported by the results of many authors, who clearly point to direct participation in combat as the greatest source of traumatic stress (5,21,36). These findings also suggest that the influence of combat experiences could be most important in determining the potentially negative long lasting psychological effects, and may provide additional evidence that exposure to death is related to somatic distress (1,5,18).

Generally speaking, the results of our study do not completely support some of the previous data about the long-term health implications of war stress in refugees (16,37,38). Several explanations are possible. Firstly, the dropout in this group was relatively high. Secondly, the earlier studies of refugees included heterogeneous groups and different types of war stress (38-41), whereas our study included a relatively homogeneous group of refugees exposed to the loss of home and occupation. Thirdly, unlike other studies, all participants in this study were male. Finally, the return of the refugees included in this study to their homes might result in the decrease of the psychological stress.

In conclusion, our findings strongly indicate general differences in assessed psychological variables depending on the type of exposure to war stress on the male population. The long-term changes in psychological variables between groups mostly corresponded to the degree of exposure to war stress: psychosomatic problems were stable over a longer time period and at their highest level in the group of refugees and soldiers.

Although the longitudinal design of this study has distinct advantages, there are also some limitations. The first limitation arises from the fact that depressive and psychosomatic complaints were self reported measures without any medical
confirmation. Although the reliability and validity of the applied questionnaires were adequate, introspection could increase the precision of the analysis of association between the exposure to different types of war stress and psychological morbidity. A disadvantage of this study could also stem from the fact that, due to ethical reasons, this study did not include any investigation of traumatic events, resulting in an inability to provide adequate psychological help to the subjects. However, this study demonstrated that the assessments based on valid and reliable instruments could be a valuable source of information, indicating that treatment of depressive and psychosomatic symptoms must be directed to early recognition. It is very important to emphasize that countries exposed to this particular type of stress have to ensure that the medical support system provides for the increasing health needs of the affected groups.

The role of the initial symptoms of depression and psychosomatic complaints, co-morbid in prediction of chronic psychiatric illness among former refugees, soldiers, and civilians, indicates the importance of early recognition and treatment. Since not all people exposed to war stress need clinical treatment, emphasis must be placed on those who will not recover without medical or psychological help. Therefore, it is necessary to develop strategies for the prevention and treatment of psychological, psychosocial, and psychosomatic disorders associated with the war.

Acknowledgment

This study was a part of the research project “Effects of war stress on psychosomatic problems”, supported by the Croatian Ministry of Science, Education, and Sports, No. 0070054.

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Received: October 21, 2004
Accepted: February 16, 2005

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