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Coping strategies in civilians during air attacks

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Abstract *Background* Coping strategies may influence the psychological outcome after a stressful event, both as coping at the time of the event and as strategies of dealing with its consequences after the event. The aim of the study was to investigate coping strategies used by civilians during the air attacks in Yugoslavia in 1999, and their association with the level of exposure, gender and psychological symptoms 1 year later. *Method* The sample is a non-selective group of 139 medical students from the University of Belgrade, Yugoslavia. Open questions and content analysis were used to assess coping strategies. Symptoms of intrusion and avoidance were assessed, as well as general psychological symptoms. *Results* Content analysis of answers to open questions revealed nine categories of coping strategies (sport and walks, leisure activities, talking and gathering, humor, avoidance, philosophical approach, getting information, work, and substance abuse). A cluster analysis identified

three groups of students with different styles of coping. Students that used dominantly ‘talking and gathering’ had the highest, and the ones that mostly used ‘leisure activities’ the lowest scores on intrusion. There were significant gender differences in how coping strategies were associated with intrusive symptoms. *Conclusion* The type of coping strategies used during the air attacks may contribute to the level of intrusive symptoms 1 year after the event. Different coping strategies might be effective in men and women to reduce intrusive symptoms. Longitudinal and prospective studies are needed to draw definite conclusions on causal relationships between coping strategies and levels of posttraumatic stress.

Key words coping – intrusion – avoidance – air attacks – gender

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Introduction

Extensive research has been carried out on posttraumatic stress disorder (PTSD) in the last decades, addressing different types of traumatic experiences. Most of the studies on war-related disorders centered on combatants (Blake et al. 1992). There has been a paucity of research on the effects of armed conflicts on civilians, especially in the countries of the conflicts (Abu-Saba 1999; Plante and Manuel 1992), although it has been shown that a significant percentage of civilians may experience high levels of psychological distress (Gavrilovic et al. 2002).

Different factors have been found to influence risk for developing and maintaining PTSD symptoms. They include pre-existing characteristics of the subjects such as personality traits, gender and previous stressful experience (Breslau 1998), features of the events, e. g., level and type of exposure (Abu-Saba 1999; Hiley-Young et al. 1995; Southwick et al. 1993), and support mechanisms after the event.

Coping strategies – defined as behaviors and cogni-

tions that individuals utilize to manage a stressful situation and the attendant negative emotions (Lazarus and Folkman 1984) – have been found to have an important influence on the psychological outcome after a stressful event, both as coping at the time of the event (Weizberg et al. 1993; Arambasic 1996) and as strategies of dealing with its consequences after the event (Wolfe et al. 1993; Harvey et al. 1991).

Some studies also indicate that there are gender differences in coping strategies (Jordan and Revenson 1999; Groer et al. 1992). It has been suggested that women and men might apply different mechanisms of stress reduction even though they are performing the same activity (Slusarcick et al. 1999). The nature of this difference and the influence of cultural factors are not yet fully understood.

The type of stressful events might influence the type and efficacy of coping strategies used (Folkman and Lazarus 1985; Mattlin et al. 1990). Hence, instruments with 'global items' for assessing coping strategies might not be applicable to some specific situations. Some authors distinguish between coping 'styles' that refer to coping with stress in general, and coping 'strategies' that refer to specific episode or type of stress (Aldwin 1993). Due to the specific nature of the stressful event we examined (air attacks), we adopted the latter term.

Research in this area is often flawed because of the heterogeneity of the sample or of the stressful events. We studied a very homogenous and non-selective group of medical students, all of whom had – objectively – experienced the same stressful event (air attacks on Yugoslavia from March 1999 until June 1999) as civilians. The interval since the event was identical in all subjects.

The study addressed the following questions:

- 1) What coping strategies do the students report?
- 2) How are the coping strategies associated with symptoms, gender, objective exposure during the air attacks, and subjective distress at the time?
- 3) Is the association between coping and current symptoms influenced by gender?

Subjects and methods

■ Participants and procedure

The sample is a group of 139 of all 141 4th-year medical students from one teaching hospital of the University of Belgrade, Yugoslavia. All of them had experienced air attacks as civilians during 1999. Ninety-five students were female and 44 male. The age ranged from 21 to 28 years (mean 23.8; SD 1.3). Students were assessed by members of the Stress Clinic, which is part of the Institute of Mental Health at the University of Belgrade. Assessments were conducted in March and April 2000 (1 year after the beginning and 9 months after the end of the air attacks). After complete description of the study to the students, 139 out of 141 students agreed to participate in the study. Written informed consent was obtained from all the subjects and confidentiality of ratings was assured.

■ Instruments

The following instruments were applied in Serbian.

Impact of Event Scale (IES; Horowitz et al. 1979)

This was used as a self-report scale to assess the frequency of intrusive and avoidance phenomena associated with the experience of a particular event.

Symptom Checklist 90-R (SCL-90-R; Derogatis 1983)

This is a 90-item instrument for self-rating of general psychological symptoms on ten subscales.

List of stressors (LS)

This list was created for the purpose of this study as a checklist of stressors during air attacks. It consists of 37 items (events such as air raid alarms, powerful detonations, death of or injury to a close person, being in or close to a bombed building) and registers the frequency of the particular event (0-none, 1-once, 2-few times, 3-often) and how upsetting it was at the time (on the scale from 0 to 4). A cumulative score of frequencies is taken as a measure of objective exposure and cumulative subjective distress as a measure of subjective distress at the time.

An open question

This addressed strategies that were helpful for reducing the stress during the bombing, i. e., "Please name ways that were useful in reducing the stress during the bombing". The lines for the answers were numbered from 1 to 5.

■ Analysis

Students' answers to the open question were subjected to content analysis. Coping categories were identified on the basis of the contents of the answers. Two independent raters assessed and categorized the answers. We intended to form groups of students on the basis of these answers and the following procedure was applied. The answers in line '1' were scored as 5, in line '2' as 4, in line '3' as 3, in line '4' as 2, and in line '5' as 1 (these 'scores' were used only for forming groups). After identifying sum scores on these categories for each student, hierarchical cluster analysis based on Euclidean distances among subjects, which optimizes Ward criterion, was applied, and three groups were formed. A discriminant function analysis was used to confirm the grouping. The reason for applying the open questions in our study was the richness of description and of information on coping strategies (both quantitative and qualitative), which open questions can capture, as well as the specific nature of the stressful event. This type of assessment has been advised by some authors (Cox and Ferguson 1991). Similar procedures have been successfully used in other studies (Priebe and Esmaili 1997). Thus, we opted for this method despite its limitations – i. e., mainly the subjectivity in forming categories, which we tried to overcome by involving two independent raters.

Chi-square tests and analyses of variance were used for comparing the different groups.

This was an exploratory study testing different independent questions so that the alpha power in statistical analyses was not Bonferroni adjusted. For the main question, i. e., whether posttraumatic stress differed between groups with different coping strategies, only two analyses of variance were computed, one with intrusion scores and one with avoidance scores as dependent variable.

In order to assess whether there is an association between coping strategies and gender on the one hand, and symptoms of posttraumatic stress on the other, two-way ANOVAs were conducted. The dependent variables in these ANOVAs were continuous scores of intrusion and avoidance on the IES. Independent factors were type of coping strategies and gender.

Results

Scores of the instruments

All students completed the full set of questionnaires that were analyzed in this study.

The mean score on the avoidance subscale of the IES was 8.3 (SD = 8.8) and on the intrusion subscale 5.3 (6.8). Mean scores on the SCL-90-R varied between 0.29 (psychoticism) and 0.80 (obsessive-compulsive). The Global Severity Index was on average 0.56 (0.47).

Objective exposure during the air attacks had a mean score of 39.0 (SD = 11.6) and subjective distress at the time 39.3 (19.1).

Regarding answers on the coping strategies used during the air attacks, we identified that 1 student did not give any answer, 3 students stated one coping strategy, 9 students stated two coping strategies, 25 students stated three, 24 students stated four, 61 students stated five and 16 students stated more than five coping strategies. Content analysis of the students' answers on the coping strategies used during the air attacks revealed the following coping strategy categories:

1. 'Sport and walks' was reported by 72 (51.8%) students in some of their answers (original answers included in this category were: sport, walks, physical activity, sport, and relaxation);
2. 'Leisure activities' were reported by 98 (70.5%) students (original answers included in this category were: games, reading, leisure activities, being with animals, and creative activities);
3. 'Talking and gathering' was reported by 126 (90.6%) students (original answers included in this category were: talking [e.g., with friends, family, over the phone], communication, playing with children, being with partner, gathering [e.g., with family and/or friends] and going out);
4. 'Humor' was reported by 12 (8.6%) students (identical with original answers);
5. 'Avoidance' was reported by 34 (24.5%) students

(original answers included in this category were: avoidance, sleeping and fantasy);

6. 'Philosophical approach' was reported by 12 (8.6%) students (original answers included in this category were: faith, accepting the circumstances, and positive thinking);
7. 'Getting information' was reported by 3 (2.2%) students (identical with original answers);
8. 'Work' was reported by 49 (35.3%) students (original answers included in this category were work and studying);
9. 'Substance abuse' was reported by 17 (12.2%) students (identical with original answers).

Classified into the categories, 1 student did not give any answer, 6 students reported one coping category, 34 students reported two different coping categories, 50 students reported three different coping categories, 41 student reported four different coping categories and 7 students reported five different coping categories.

One answer was classified as 'Others' and, thus, was not included into cluster analysis.

The cluster analysis identified three groups of students, and the grouping was confirmed by discriminant function analysis. The first group (35 students) used dominantly 'leisure activities' and less 'work' than students from the other groups. The second one (86 students) reported a moderate use of both 'leisure activities' and 'talking and gathering'. 'Sport and walks', 'substance abuse' and 'avoidance' strategies were more prominent in this group than in the other two groups. This second group was the most heterogeneous one with respect to coping strategies, with no single dominant strategy. The third group (18 students) was characterized by high use of 'talking and gathering' and more 'humor' than the other groups.

Table 1 shows means, standard deviations and F values of the categories of coping strategies for the three clusters of students.

Table 2 shows actual and predicted cluster membership and percentage of correct predictions.

Table 1 Means, standard deviations (SD) and F values of the categories of coping strategies for the three clusters

Categories of coping	Cluster I dominant 'leisure activities' N = 35	Cluster II 'leisure activities' 'talking and gathering' and others N = 86	Cluster III dominant 'talking and gathering' N = 18	F value
Work	0.51 (1.0)	1.4 (2.2)	1.9 (2.3)	3.8*
Avoidance	0.14 (0.5)	1.2 (2.0)	0.39 (1.0)	5.9**
Substance abuse	0.03 (0.17)	0.70 (1.7)	0.00 (0.00)	3.9*
Philosophical approach	0.00 (0.00)	0.40 (1.2)	0.11 (0.32)	2.4
Humor	0.09 (0.50)	0.10 (0.46)	1.5 (2.6)	16.2***
Talking and gathering	3.9 (2.8)	4.0 (2.0)	9.5 (2.0)	46.2***
Leisure activities	8.7 (2.2)	2.5 (2.2)	1.4 (1.7)	115.9***
Being informed	0.00 (0.00)	0.15 (2.6)	0.00 (0.00)	0.58
Sport and walks	1.4 (1.8)	2.8 (2.8)	0.50 (1.2)	9.1***

* p < 0.05; ** p < 0.01; *** p < 0.001

Table 2 Actual and predicted cluster membership and percentage of correct predictions

Actual cluster membership	N	I	II	III
Cluster I	35	34 (97.1)	0 (0)	1 (2.9)
Cluster II	86	4 (4.7)	78 (90.7)	4 (4.7)
Cluster III	18	0 (0)	0 (0)	18 (100)

Percent of 'grouped' cases correctly classified: 93.5%

Univariate analysis

Table 3 summarizes the results of univariate analyses for the three groups on coping.

Objective exposure and subjective distress at the time of air attacks, and gender ($\chi^2 = 1.9$, $df = 2$, $p > 0.05$) did not differ significantly between the three groups of students.

The 'coping' groups differed significantly on the intrusion scale, with the first group – that used dominantly 'leisure activities' – having the lowest, and the third group – characterized by 'talking and gathering' – the highest score.

The groups showed similarly directed differences on avoidance and Global Severity Index, which, however, failed to reach statistical significance.

Interaction of previous type of coping and gender

The two-way ANOVA with the IES intrusion score as dependent variable revealed a significant main effect of coping ($F = 4.14$, $df = 2$, $p < 0.05$) and a significant interaction effect of coping by gender ($F = 6.65$, $df = 2$, $p < 0.01$). There was no significant main effect of gender.

When the avoidance score was taken as dependent variable, the two-way ANOVA did not reveal any significant main or interaction effect, i. e., three groups with different coping strategies and students of different gender did not differ significantly in their avoidance scores.

Table 4 summarizes intrusive symptoms in female and male students that used different coping strategies.

Table 4 Means (SD) on IES intrusion in female and male students that used different coping strategies

	Cluster I dominant 'leisure activities'		Cluster II 'leisure activities' 'talking and gathering' and others		Cluster III dominant 'talking and gathering'	
	N = 35		N = 86		N = 18	
	females	males	females	males	females	males
Mean (SD)	2.8 (5.2)	3.1 (4.5)	7.3 (7.0)	2.7 (3.7)	5.0 (8.6)	12.4 (11.0)
N	27	8	57	29	11	7

Discussion

In assessing coping strategies following a stressful event, investigating a complete and non-selective group seems important. In selective samples, subjects that respond with avoidance or the ones that successfully coped might be more likely not to participate in a study so that the findings can be biased. There was hardly any such selection in this study with 139 out of 141 students participating. Moreover, the group of students was fairly homogeneous with little or no variance of factors such as education, age, social and marital status. Thus, there was no need to control for the influence of those potentially confounding factors. Whilst these aspects may be regarded as methodological strengths of the study, there were also some shortcomings, most notably that it was a cross-sectional and retrospective analysis and that measures of coping were subjective.

'Talking and gathering' was the most prevalent strategy followed by 'leisure activities' and 'sport and walks'. Social support activities, as reflected in 'talking and gathering', were almost ubiquitous in the examined population, but the students differed in the level of its use, and in the concurrent use of other coping strategies.

The group of students that dominantly used 'leisure activities' have the lowest scores of intrusive symptoms 1 year after the attacks, which might suggest that the strategy has been successful. Leisure activities at the time of exposure to an uncontrollable external stressor might be a form of what has been termed a 'healthy de-

Table 3 Means (SD) and significance of differences of objective exposure, subjective distress, IES intrusion and avoidance and Global Severity Index for three groups with different coping strategies

	Cluster I dominant 'leisure activities'	Cluster II 'leisure activities' 'talking and gathering' and others	Cluster III dominant 'talking and gathering'	F value
	N = 35	N = 86	N = 18	
Objective exposure	40.0 (10.8)	39.0 (10.8)	37.2 (12.8)	0.33
Subjective distress	40.0 (19.6)	40.0 (19.1)	34.7 (18.4)	0.60
IES intrusion	2.9 (4.9)	5.7 (6.45)	7.9 (10.0)	3.80*
IES avoidance	6.5 (7.9)	8.5 (8.8)	10.7 (10.2)	1.50
SCI-90-R Global Severity Index	0.52 (0.52)	0.55 (0.38)	0.66 (0.69)	0.56

* $p < 0.05$

nial' (Druss and Douglas 1988) reflecting resilience in extremely difficult situations. However, due to the cross-sectional nature of the study, no conclusions can be drawn on causal relationships between coping strategies and levels of posttraumatic stress. Thus, coping strategies might have influenced symptoms, but symptom levels might also have had an impact on the coping strategies used. A high level of intrusive symptoms might have motivated students to gather and talk and prevented them from using leisure activities.

The group that used dominantly 'talking and gathering' had the highest score on intrusion. These 'coping strategies' might prevent a 'healthy' denial as described above and, thus, increase a risk of intrusion. As with the previous coping category, the possibility of high intrusive symptoms influencing retrospective reporting of talking and gathering coping strategies has to be considered. In the interpretation of this result, the frequency of the strategies should be taken into account (e. g., 'humor' was reported by only 8.6% of the students).

Recent studies suggest that psychological debriefing is ineffective and may even have adverse long-term effects (Mayou et al. 2000). At the same time, some forms of psychotherapy that also include talking about the traumatic event have been found to be effective in reducing posttraumatic stress (Ebbinghaus et al. 1996). Thus, talking about a traumatic event may lead to favorable or unfavorable results, and it is not yet clear what makes talking helpful or detrimental. One might speculate that the timing of talks (at the time of stressful event or afterwards), the type and content of talks, and the selection of subjects for the intervention are all relevant.

Our findings suggest that the type of coping strategies during the actual event may have had an influence on intrusion, but not on avoidance. A phasic quality of those two symptom complexes has been suggested in the literature (Horowitz 1976; Zilberg et al. 1982) and coping strategies during the event might have a different impact on the two phases.

Gender did not have a direct impact on intrusion or avoidance, but modified the interaction of coping strategies and intrusive symptoms. Students that used mainly 'leisure activities' had rather low scores on intrusion, regardless of their gender, and these activities appear to be of the strongest protective value in terms of intrusive symptoms. When strategies of 'talking and gathering' are used excessively, male students appear to be at higher risk for the development of intrusive symptoms.

Some social and cultural specificity of the sample might influence the result (culturally, the 'male' role is viewed more as 'active', while the female role is viewed as 'passive' or 'social'). Although all male students in this group experienced air attacks as civilians, it could be that the anticipation of life danger was higher for men (due to possibility of conscription that applies mainly to young men), thus requiring even higher denial.

Females from the group that used diverse coping strategies had the highest intrusion scores. Dominantly

using one coping strategy might be a more effective way of coping for them.

Conclusion

The type of coping strategies used during the air attacks may contribute to the level of intrusive symptoms 1 year after the event. Gender appears to influence this relationship, i. e., different coping strategies seem to be protective or a risk factor respectively for males and females. Whether the findings can be replicated in other groups of civilians in armed conflicts, and what the precise psychological processes explaining the gender difference are, will have to be explored in further research. Prospective longitudinal studies are required to identify causal relationships between coping strategies and posttraumatic stress as well as the way this association is gender specific.

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