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Treatment of Posttraumatic Stress Disorder in Postwar Kosovo High School Students Using Mind–Body Skills Groups: A Pilot Study

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This preliminary study examined whether the practice of mind–body techniques decreases symptoms of posttraumatic stress in adolescents. Posttraumatic Stress Reaction Index questionnaires were collected from 139 high school students in Kosovo who participated in a 6-week program that included meditation, biofeedback, drawings, autogenic training, guided imagery, genograms, movement, and breathing techniques. Three separate programs were held approximately 2 months apart. There was no control group. Posttraumatic stress scores significantly decreased after participation in the programs. These scores remained decreased in the 2 groups that participated in the follow-up study when compared to pretest measures. These data indicate that mind–body skills groups were effective in reducing posttraumatic stress symptoms in war-traumatized high school students.

KEY WORDS: posttraumatic stress; war; mind–body techniques; adolescents.

The Serbian offensive against Albanians began in early 1998 in the Drenica region of Kosovo. Fighting quickly spread to the Suhareka region and continued through June 1999 when NATO troops entered Kosovo. Suhareka was particularly hard hit by the war. Twenty percent of all the students in Suhareka's Jeta e Re ("New Life") high school lost one or both parents. At the time of the study there were still scattered episodes of ethnic violence in most of Kosovo and bodies of those killed were still being discovered.

Posttraumatic stress disorder (PTSD) has been widely reported in children and adolescents exposed to war in the Balkans (Ajdukovic, 1998; Goldstein, Wampler, & Wise, 1997; Smith, Perrin, Yule, Hacam, & Stuvland, 2002). Most treatment approaches for PTSD in children and adolescents include some degree of psychological support, education, and stress management for the children, the parents, and sometimes the teachers (Cohen, Berliner, & March, 2000). Stress management strategies may include mind–body techniques such as positive imagery, slow deep diaphragmatic breathing, and progressive muscle relaxation (Cohen et al., 2000; Layne et al., 2001; March, Amaya-Jackson, Murray, & Schulte, 1998). In children, PTSD interventions have included art therapy (Cohen et al., 2000) and biofeedback has been used in adults (Peniston, 1986).

The Center for mind–body Medicine (CMBM) faculty chose the mind–body skills used in this program for adolescents—meditation, biofeedback, movement, guided imagery, drawings, autogenic training, genograms, and breathing techniques—because we have used them extensively with troubled adolescents as well as in training health care professionals in the United States. These techniques mobilize a wide range of mental, emotional, imaginative, and physical abilities. They gave the adolescents a direct experience of their capacity to make positive changes in their psychological and physiological state and

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to explore both the causes of, and creative responses to, their stress.

Method

Participants

Students were recruited by the teachers from Jeta e Re high school in Suhareka beginning in October 1999, four months after the end of the NATO bombing and the signing of a U.N.-policed truce in Kosovo. One hundred eighty-one students participated in the study. Forty-two had missing data mostly due to incomplete questionnaires. The data presented represent the remaining 139 students, 75 boys and 64 girls. Information on the ages of the students was only available for the first two groups participating in the program. Their ages ranged from 12 to 19 years, with most of these students (88%) being between 16- and 19-years old. The program was reviewed by a committee that included the school principal, a district school psychologist, and a local pediatrician. All participation was voluntary and informed consent was given orally by students and their parents. There were no formal inclusion/exclusion criteria based on exposure or standardized screening as all students in this war zone had been directly exposed to assaults and atrocities—90% of all homes were destroyed and virtually everyone in the community had relatives and close friends who were killed. Announcements were made in school assemblies and any student who wanted to participate was welcome. Forty percent of the school's 450 students participated in the program.

Intervention

The mind–body skills group program was taught by five teachers of the school who had been trained by CMBM faculty in an initial 5-day intensive training program in Prishtina, Kosovo. The 146 participants in the training included physicians, nurses, psychologists, social workers, and teachers. The training was presented in English and translated into Albanian. Large group didactic sessions included lectures on the biology of the central and autonomic nervous system; the "fight or flight" and "stress" responses; criteria for diagnosing PTSD; the principles of mind–body skills; approaches to group therapy; and "interviewing people with PTSD." There were also lectures on relaxation, meditation, biofeedback, and autogenic training. The small group sessions were experiential and provided the opportunity to practice the techniques presented in the lectures.

The teachers used the same materials and experiential approaches that were used in the training program for the students' program, eliminating some of the more technical material, the research data, and the information specific to health care professionals. The program for students was held for 3 hr on six successive Saturday mornings. Over the course of 9 months three groups of students participated in the study. The first group began in October 1999, the second in February 2000, and the third in May 2000.

Each session began with a large group didactic session followed by small experiential groups. In the small groups students learned relaxation techniques, guided imagery, autogenic training, quiet and active meditations, and biofeedback, using temperature sensitive biofeedback "dots." They used drawings to express feelings and thoughts, and constructed genograms to explore strengths and vulnerabilities in their own families. Each small group included two opportunities for self-expression. The first was an opening "check-in" where the students could talk about what they had been feeling and thinking during the previous week and whether or not they had used the techniques they had learned. After the experiential exercises students were invited to share their emotional responses to what they had just experienced, and the technique's success in reducing their level of stress. Students were encouraged to practice the skills at home and with their families. Absence from the groups was rare and no students dropped out of the program.

Measures

PTSD was measured using the PTSD Reaction Index. This is a scale with 16 dichotomous questions patterned after criteria for PTSD as described in the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III)*. This version was previously used with school-age children (Pynoos et al., 1987) and was chosen for its simplicity for translation into Albanian. It was back translated for accuracy. The correlation of Reaction Index scores with confirmed cases of PTSD has been reported as .91 with children (Frederick, 1985). Using the Kuder–Richardson formula (K-R 20), the internal consistency coefficient of the PTSD Reaction Index for the baseline measurements was .69. Participants were tested before entry into the program and at the end of the sixth group. The questionnaire was also administered at a 15-month follow-up for a subset ($n = 30$) of the first group of students and at a 9-month follow-up for the second group of students. Only two of the groups were included in a follow-up because many of the students graduated after the third session, and could not be contacted.

The follow-up time periods were different due to methodological difficulties for the teachers in administering the follow-up questionnaires.

Statistical Analysis

Pre- and posttest differences in mean PTSD scores were measured using a paired t test in Groups I and III. The pretest, posttest, and follow-up scores in Group II and the Group I subset were analyzed with a repeated measures analysis of variance (ANOVA). Pairwise differences were measured using a paired t test with a Bonferroni correction. The adjusted alpha was $\alpha = .05/3 = .017$. Incomplete questionnaires were scored on a weighted scale and the mean scores of the weighted questionnaires were compared to the mean scores of the complete questionnaires in each group using an unpaired t test. Pairwise differences in baseline levels of PTSD among the three groups were also analyzed using an unpaired t test.

Results

The mean and standard deviation for PTSD scores for each of the three groups of students are shown in Table 1. Significant decreases in PTSD were measured in all three groups after participation in the program ($p < .001$). In Group II, follow-up PTSD scores were significantly lower than either the pretest or the posttest scores ($p < .001$). The follow-up PTSD scores in the Group I follow-up subset were significantly lower than the pretest scores ($p < .001$), but did not reach statistical significance, $t(29) = 2.48$, $p < .05$, when compared to the posttest scores. Effect sizes were measured using Cohen's d with values of 0.6, 2.1, and 2.4 for changes in pre- and posttest measurements of Groups I, II, and III, respectively indicating a moderate clinical difference ($d = 0.5$) in Group I and large clinical differences ($d = 0.8$) in Groups II and III.

PTSD Reaction Index categories have been previously established with scores of less than 7 indicating no PTSD; 7–9 suggesting mild PTSD; 10–12 suggesting moderate PTSD; and greater than 12 indicating severe PTSD (Pynoos et al., 1987). In Group I, 66% of students had pretest scores indicating mild to severe PTSD, whereas in Groups II and III, 96% had scores in this range. In the posttest measures, these percentages dropped to 44, 38, and 35%, respectively. Pretest scores indicating severe PTSD were 17, 32, and 35% in the Group I follow-up subset, and Groups II and III, respectively. At the posttest measurement, none of the students in the Group I follow-up subset or Group III had severe PTSD scores, and in Group II this number was only 2%. None of the students had scores in the severe range at follow-up.

Because some bias may have been introduced by the number of incomplete questionnaires, we wanted to determine whether there was any difference in the levels of PTSD in those students with incomplete questionnaires compared to students with complete questionnaires in each group. The number of incomplete questionnaires in Groups I, II, and III were 14, 8, and 10, respectively. One questionnaire had two items missing and the others had only one item missing. There was no significant difference in the pre- and posttest weighted scores compared to the pre- and posttest scores of complete questionnaires in each group.

To determine whether PTSD may have been decreasing as a result of time, the mean baseline levels of PTSD of the three groups were compared. Group I ($M = 8.3$, $SD = 3.9$) actually had significantly lower baseline levels of PTSD when compared with Group II ($M = 10.8$, $SD = 2.4$), $t(86) = -3.67$, $p < .001$, and Group III, ($M = 11.4$, $SD = 2.4$), $t(90) = -4.62$, $p < .001$.

Table 1. Repeated Measures of Posttraumatic Stress Scores in Kosovo High School Students

		$M(SD)$				
	n	Pretest	Posttest	Follow-up	t	F
Group I	41	8.3(3.9)	6.1(2.6)	N/A[a]	$t(40) = 7.27$*	—
Group I follow-up subset	30	$8.3(4.4)_a$	$6.2(2.9)_b$	$5.3(2.3)_b$	—	$F(2, 29) = 23.04$*
Group II	47	$10.8(2.4)_a$	$5.8(2.4)_b$	$4.4(1.8)_c$	—	$F(2, 46) = 177.03$*
Group III	51	11.4(2.4)	5.5(2.5)	N/A[a]	$t(50) = 15.53$*	—

Note. A repeated measures ANOVA was performed in groups having follow-up measurements. Pairwise differences between all three measures were determined using paired t tests with Bonferroni correction ($\alpha = .05/3 = .017$). Means in the same row that do not share subscripts differ at $p < .001$. One-tailed t tests were done when comparing pretest and posttest scores. All comparisons with follow-up scores were two-tailed t tests.

[a]N/A: not available.

*$p < .001$.

Discussion

This open trial shows that the students attending the mind–body skills group program led by trained teachers had decreased PTSD scores. Mean scores of PTSD were significantly reduced following participation in the program and were reduced further in the follow-up measurement of Group II but were not significantly reduced further in follow-up of the Group I follow-up subset. This difference may have been due to the smaller size ($n = 30$) of the Group I follow-up subset as compared to Group II ($n = 47$). What was particularly striking was the reduction of severe PTSD levels at posttest and follow-up. None of the students had severe PTSD levels in Groups I and III posttest or in the follow-up measures, and only 2% of the students in Group II had severe PTSD levels at posttest.

It is likely that several factors contributed to the reduction in PTSD scores. The mind–body skills themselves are likely to have made a significant contribution to decreasing levels of stress and diminution of PTSD symptoms. These skills enhance an individual's sense of control and have been demonstrated to lower sympathetic arousal, decrease anxiety, and improve mood (Kiecolt-Glaser & Glaser, 1992). Social support, the opportunity for self expression, and the teachers' caring commitment probably made major contributions as well. Students often told the investigators that the groups made them feel that they were "not alone" with their terrible memories, that they learned that their symptoms of distress were normal responses to abnormal stress and that they felt closer to one another and their teachers after participating.

The results suggest that the passage of time by itself did not diminish the symptoms. Students in Groups II and III, which began later, actually had significantly higher baseline levels of PTSD than Group I. The increase in the baseline levels in the later groups may be explained because the students who were experiencing more severe symptoms, such as avoidance and diminished interest in regular activities, volunteered only after they became aware of the success of the initial group.

Methodological limitations, which are common in studies on children who have experienced war trauma (Swenson & Klingman, 1993), were also present in our study and limit our understanding of differences in baseline levels of PTSD and conclusions about long-term follow-up. The use of a waitlist control in these postwar circumstances was not feasible. Because teachers were running the program and collecting data on their own time, this study was limited to one self-report measure. There was no documentation of individual trauma exposure or inclusion criteria for participation in the program. Finally, because students either graduated or were otherwise difficult to contact, follow-up data was obtained only from the second group, and from a portion of the first group.

In summary, this study shows that participation in mind–body skills groups significantly reduced PTSD symptoms in war-traumatized high school students in Kosovo. Though it was a pilot study and lacked controls, this program may represent a significant advance in therapeutic approaches to traumatized adolescents. Because it relied on training nonspecialist teachers and because this kind of training can be offered to large numbers of health care professionals, it may also represent a promising approach to addressing PTSD in entire populations that have been affected by wars, epidemics, and other disasters. The CMBM is currently collaborating with Kosovo's leading psychiatrists and psychologists to provide this training to all professionals in the new community mental health system, as well as to teachers in the Suhareka region.

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