Published Version Access: http://dx.doi.org/10.1037/trm0000081/
DOI: 1085-9373/16

Mind–Body Skills Groups for Posttraumatic Stress Disorder in Palestinian Adults in Gaza

James S. Gordon, Julie K. Staples, David Y. He, and Jamil Ahmed Abdel Atti

Abstract

A mind–body skills group (MBSG) program was evaluated to determine its effect on symptoms of posttraumatic stress disorder (PTSD), depression, anxiety, and quality of life in adults in Gaza. The 10-session mind–body skills groups (MBSGs) included meditation, guided imagery, breathing techniques, autogenic training, biofeedback, genograms, and self-expression through words, drawings, and movement. Data were analyzed from 92 adults meeting criteria for PTSD. Significant improvements in PTSD, depression, and anxiety symptoms and significant improvements in quality of life (QOL) were observed immediately following participation in the program. At 10-month follow-up, the improvements in the PTSD, depression, anxiety, overall QOL and health scores, and the physical health and social relationship domains of QOL were fully maintained. Improvement was partially maintained for the psychological QOL domain but was not maintained for the environment domain. MBSGs are easily taught to health professionals and can reduce PTSD, depression, and anxiety symptoms, and improve QOL in adults affected by war and political violence.

Keywords: mind–body therapies, posttraumatic stress disorders, depression, anxiety, quality of life

James S. Gordon and Julie K. Staples, The Center for Mind–Body Medicine, Washington, DC; David Y. He, Analytical Solutions Group, Inc., North Potomac, Maryland; Jamil Ahmed Abdel Atti, The Center for Mind–Body Medicine, Gaza City.

We thank the Gaza clinicians for leading the mind–body groups; the Gaza program coordinator, Eman Abu Ruken, for organizing the groups and collecting the data; Dan Sterenchuk, Lee-Ann Gallarano, and Margaret Gavian, for coordinating the logistics of the training programs in Gaza; Amy Shinal for supervising the group leaders; M. Miles Braun, Larry Muenz, and Karen Grace-Martin for statistical consultation; and Timothy Eden and Bexia Shi for assistance with the literature review.

Correspondence concerning this article should be addressed to James S. Gordon, The Center for Mind–Body Medicine, 5225 Connecticut Avenue, Northwest, Suite 414, Washington, DC 20015. E-mail: jgordon@ cmbm.org

The Gaza Strip has long suffered from war, violence, economic hardship, overcrowding, and high unemployment (Llosa et al., 2012). A number of studies have shown that ongoing armed conflicts, including the one affecting Gaza, are associated with higher posttraumatic stress disorder (PTSD; Canetti et al., 2010; de Jong et al., 2001). In a 2007 study (the same time frame as this intervention) of 221 men and 218 women in Gaza, 22.6% of the men and 23.9% of the women were diagnosed with PTSD (Canetti et al., 2010). In 2007–2008, 46% of all patients 16 years and older in a Gaza mental health program were diagnosed with PTSD (Llosa et al., 2012). Together, these studies suggest that PTSD affects a sizable percentage of Gaza's adults.

According to the United States National Institutes of Health (NIH; National Institutes of Health, 2010), "Mind-body medicine focuses on the interactions among the brain, the rest of the body, the mind, and behavior as well as the ways in which emotional, mental, social, spiritual, experiential, and behavioral factors can directly affect health" (p. 1). The NIH has defined mind–body medicine therapies as "interventions that use a variety of techniques designed to facilitate the mind's capacity to affect bodily function and symptoms (Astin, Shapiro, Eisenberg, & Forys, 2003)." Individual components of mind–body medicine include meditation, guided imagery, biofeedback, movement, verbal and written self-expression, and drawings. Mind–body medicine also includes physical activities that exert beneficial effects on mental and emotional functioning (National Institutes of Health, 1992; van der Kolk, 2006). All of these techniques have been used as part of treatment programs for a variety of physical and psychological conditions, including PTSD, anxiety, and depression.

Basic science research and functional neuroimaging have helped to identify several peripheral and central nervous system regions that may be significantly affected in PTSD, among them, the autonomic nervous system (ANS), the amygdala, the medial prefrontal cortex, and the hippocampus. PTSD is associated with a chronic arousal of the sympathetic nervous system (SNS; Cohen et al., 2000). Functional neuroimaging studies have provided evidence for hyperactivity in the amygdala (Shin & Liberzon, 2010). The prefrontal cortex has been shown to decrease in volume in patients with PTSD (Shin, Rauch, & Pitman, 2006), as has the hippocampus (Hedges & Woon, 2007; Kasai et al., 2008).

Mind– body approaches may help reverse these changes as well as relieve PTSD symptoms. Regular practitioners of mindfulness meditation have significantly larger volumes of the right hippocampus (Hölzel et al., 2008) and a significant increase in gray matter in the prefrontal cortex (Lazar et al., 2005). Transcendental meditation, a form of concentrative meditation, has been shown to reduce PTSD symptoms in Congolese refugees (Rees, Travis, Shapiro, & Chant, 2013), and in combat veterans serving in Iraq and Afghanistan (Rosenthal, Grosswald, Ross, & Rosenthal, 2011).

The high frequency (HF) heart rate variability (HRV) component reflects parasympathetic activity and is decreased in PTSD (Chalmers, Quintana, Abbott, & Kemp, 2014). Guided imagery has been shown to increase the HF HRV component prior to and after exposure to an anxiety provoking stimulus (Jing, Wu, Liu, Wu, & Miao, 2011). Guided imagery and relaxation produced significant decrease in symptoms of PTSD and depression with Kosovo refugee children (Möhlen, Parzer, Resch, & Brunner, 2005). Biofeedback, which has been repeatedly demonstrated to reduce excessive sympathetic nervous system activity (McGrady, 1994) has been successfully incorporated in a virtual-reality exposure therapy for PTSD (McLay et al., 2011).

Expressive writing attenuated neuroendocrine (cortisol) responses to trauma-related memories among patients with PTSD (Smyth, Hockemeyer, & Tulloch, 2008). An expressive arts therapy program, which included drama, music, and dance, has reduced symptoms of PTSD in children exposed to political violence in Indonesia (Tol et al., 2008).

The MBSGs that constituted the intervention in this study included all these techniques as well as others (e.g., autogenic training and genograms). The small group setting, in which they were taught and shared, provided the social support that is generally acknowledged as a crucial element in healing from trauma (Hobfoll, Hall, & Canetti, 2012; Schweitzer, Melville, Steel, & Lacherez, 2006).

The MBSG model was developed over 20 years and has proved useful and acceptable in a variety of settings with participants of different ages (children, as well as adults), in a variety of cultures including Albanians (Gordon, Staples, Blyta, & Bytyqi, 2004; Gordon, Staples, Blyta, Bytyqi, & Wilson, 2008), Palestinians (Staples, Abdel Atti, & Gordon, 2011), and in the US with medical students (Gordon, 2014),

veterans (Gordon, Staples, Hamilton, & Uddo, 2016), and health care professionals (Staples & Gordon, 2005). These participants have appreciated the immediate reduction in tension and anxiety, and the sense of control this approach offers. They also enjoy the opportunity to use their imagination and to move their bodies to release physical tension.

In a randomized controlled trial by the authors (Gordon et al., 2008) in Kosovo, the first randomized controlled trial of any intervention with war-traumatized children, the same Center for Mind-Body Medicine (CMBM) model that is used in the present study demonstrated an 80% reduction in PTSD symptoms. In another study in Gaza, 129 children and adolescents who met the criteria for PSTD participated in similar MBSGs. PTSD levels fell to 9.3% immediately following program participation and were 27.6% at 7-month follow-up (Staples et al., 2011). To date, the MBSG model has been used with over 35,000 Palestinian children and adults in Gaza.

Although these MBSGs have demonstrated success in improving PTSD symptoms in Palestinian children and youth in Gaza, the models had never been tested in war-traumatized adults. The purpose of this pilot study was to determine if the same program of 10-session long MBSGs could be helpful to Palestinian adults. It was designed to test the effectiveness of the intervention for PTSD, depression, anxiety, and quality of life.

Method

Participants

Data were collected from 534 Palestinian adults attending MBSGs led by CMBM trained health care professionals. Participants were recruited through the United Nations Relief and Works Agency (UNRWA), and local nongovernment organizations (NGOs) including the Red Crescent, the Gaza Community Mental Health Programme, and Islamic Relief. The aim was to make the MBSG program as widely available as possible to the many troubled as well as severely traumatized adults. These organizations were notified about the program by the CMBM staff in Gaza. If the people whom they served were interested in participating, they contacted the program's clinical director.

In order to determine the effects of the MBSG program in reducing symptoms of PTSD, data were analyzed from participants meeting the *Diagnostic and Statistical Manual of Mental Disorders,* fourth edition (*DSM–IV*; American Psychiatric Association, 1994) criteria for PTSD according to baseline symptom scores on the Harvard Trauma Questionnaire (HTQ; Mollica et al., 1992). The *DSM–IV* PTSD criteria were current at the time of the study. Ninety-two of 503 participants with matching baseline-post data (18.2%) met the PTSD criteria. The data analysis focused on these 92 because it was most important to understand whether the MBSG program could be of significant benefit to those who are most traumatized. Of the participants meeting the PTSD criteria, 91/92 (98.9%) and 88/91 (96.7%) also met the Hopkins Symptom Checklist-25 (HSCL-25; Mollica, Wyshak, de Marneffe, Khuon, & Lavelle, 1987) criteria for depression and anxiety, respectively. The depression and anxiety criteria are based on a cut-off score of 1.75 for both depression and for anxiety (Mollica, McDonald, Massagli, & Silove, 2004). Thirty-one of the 503 participants did not fill out post questionnaires. Of these 31, only three met the criteria for PTSD. Only those with matching baseline and post questionnaires were included in the reported per-protocol analysis. An additional intent-to-treat analysis that included the three additional participants was also performed on the outcome measures.

The age range of these 92 participants was 18–49 years, with a mean age of 29.9 years. Forty-two percent were male and 58% were female. Fifty percent of participants were married; 42.4% were single; 4.3% were separated or divorced; and 3.3% were widowed. The highest levels of education completed by participants were as follows: 5.4% preparatory school (Grades 7–9); 45.6% secondary school (Grades 10–12); 48.9% postsecondary school (including university). Because of the extremely poor economic conditions in Gaza only 30.4% were employed.

Intervention

Data from this study were gathered from September 2007 to December 2008. The MBSG program was led by 29 CMBM trained health and mental health professionals and educators supervised by CMBM Palestinian faculty members in Gaza. The professionals who led the MBSGs all participated in a comprehensive training and supervision program led by CMBM international faculty and its Gaza

leadership team. Faculty for this program and group leaders included physicians, social workers, psychologists, nurses, and educators.

This training program included two 5-day trainings. In the initial 5-day training, participants learned the scientific basis of the techniques used. The Gaza trainees practiced them and shared their experiences in small groups. In the second five days of the training, these participants had the opportunity to lead, in pairs, the same kind of small group in which they had originally participated. Afterward, these participants received feedback from group members and from the faculty member who was in charge of the group. Subsequently, all trainees led MBSGs with the population with which they ordinarily worked (e.g., children in a school, adults at a health clinic). They were all supervised weekly by Gaza senior faculty. Some 600 of Gaza's clinicians and educators have been trained by CMBM, and the supervising team includes the 20 clinicians who are CMBM faculty.

In this study, the CMBM trained group leaders ran from one to four 10-session groups each. There were 66 MBSGs total, and 48 MBSGs had some participants qualifying with PTSD criteria. The MBSGs were held at UNRWA or the individual NGOs where the participants were recruited. All group leaders in this study received weekly supervision.

The MBSG program was held for 2 hr, once a week, with 10 sessions total. Participants gathered together to and responded to the baseline research packets prior to the first session. They were administered by members of the research team. The group leaders were also present for participants' questions. There were five to 11 participants per group (*M* 8.2; *SD* 1.4). The model has been previously described (Gordon et al., 2008). An outline of the session contents as well as a brief description of each session is shown in Figure 1.

Every group had the same basic structure. It began with slow deep soft belly breathing, a concentrative meditation. It continued with a "check in" in which each participant shared her or his recent experience with the techniques and important events that have transpired between groups. Each participant then described how she or he was feeling at the present moment. The group leader then taught a mind–body skill and invited the participants to practice the skill. This was followed by participants sharing their experience of the skills. The group concluded with a brief meditation.

Measures

At the time the study was performed, PTSD was classified as an "anxiety disorder" according to the *DSM–IV* and defined as "the development of characteristic symptoms following exposure to an extreme traumatic stressor" (American Psychiatric Association, 1994, p. 424). PTSD is now classified as a "trauma and stressor- related disorder" in the *Diagnostic and Statistical Manual of Mental Disorders,* fifth edition (*DSM–5*; American Psychiatric Association, 2013, p. 271).

PTSD symptoms were assessed using the HTQ (Mollica et al., 1992). The 16 questions of the HTQ that correspond with 16 of the 17 diagnostic criteria for PTSD as set forth by the American Psychiatric Association (*DSM–IV*) were used to screen participants for PTSD symptoms as described above. Symptoms are scored using a 4-point Likert scale. PTSD was defined according to a scoring algorithm previously described (Mollica et al., 1999). This

definition of PTSD requires a score of 3 or 4 on at least one of the four reexperiencing symptoms (Criterion B), at least three of the seven avoidance and numbing symptoms (Criterion C), and at least two of the five arousal symptoms (Criterion D). The HTQ has been shown to have very good internal consistency in a Palestinian population in the Gaza Strip (Cronbach's .92; Kanninen, Punamäki, & Qouta, 2002). In this study, Cronbach's alpha was .88 for baseline HTQ scores.

Depression and anxiety symptoms were measured using the 25-item version of the HSCL-25 (Mollica et al., 1987). The HSCL-25 has a 10-item subscale for anxiety and a 15-item subscale for depression. Each item is scored using a 4-point Likert scale. Good internal consistency has been reported for the anxiety subscale (Cronbach's .83) and the depression subscale (Cron- bach's alpha .85) using an Arabic version of the HSCL-25 (Kleijn, Hovens, & Rodenburg, 2001). In this study, Cronbach's alpha was .89 for both the baseline anxiety and depression subscale scores of the HSCL-25. Both the HTQ and HSCL-25 were developed by the Harvard Program in Refugee Trauma. They are widely used cross-cultural screening instruments having very good construct validity (Mollica et al.,

2004).

Quality of life (QOL) was measured using the World Health Organization Quality of Life Scale – abbreviated version (WHOQOL- BREF; WHOQOL Group, 1998). The WHOQOL-BREF has 26 items. Two items measure overall QOL and general health, and the other 24 items are divided into four domains: psychological, physical health, social relationships, and environment. Items are rated on a 5-point Likert scale, and the scores are transformed to a 0 to 100 scale. A higher score indicates better QOL. An

Description of Mind-Body Skills Groups Sessions

The basic session structure involves: (1) Beginning with a slow, deep breathing meditation; (2) Check-in; (3) Explanation of an expressive or mind-body technique and practice of the technique; (4) Sharing the experience of the technique with the group; and (5) Concluding with a slow, deep breathing meditation.

Session 1: Three Drawings

1. Yourself – how you feel now
2. Yourself – with your main problem
3. Yourself – how you would be if the problem was solved

Session 2: Biofeedback and Autogenic Training

Use of autogenic phrases with measurement of change in hand temperature using temperature sensitive Biodots

Session 3: Self-Awareness Body Scan Meditation

To increase awareness of physical symptoms and their relationship to emotional states

Session 4: Guided Imagery

Use of a "Safe Place" guided imagery to create relaxation during stress and "Wise Guide" imagery to access intuition and provide imaginative solutions to problems

Sessions 5 and 6: Genograms

Use of genograms to explore one's place in one's family, to become aware of family strengths and weaknesses, and to find sources of support in family members

Session 7: Fast Deep Breathing Followed by Free Movement to Music

To release tension, raise energy, and express feelings

Session 8: Eating Meditation

Eating a date slowly and consciously to experience mindfulness in eating and to model and encourage the cultivation of mindfulness in all activities

Session 9: "Dialogue with a Symptom"

A written exercise in which one explores the meaning of physical or emotional symptoms and finds ways to relieve them

Session 10: Three Drawings

1. Yourself – how you feel now
2. Yourself – how you would like to feel
3. Yourself – how you are going to get from how you feel now to how you would like to feel

- Sharing of differences and similarities between the two sets of drawings from Sessions 2 and 10
- Discussion of what has been learned, how participants will use techniques themselves and with others (families, friends, etc.)
- Closing celebration
- Filling out Post Research Questionnaires

Figure 1. Description of mind–body skills groups sessions.

Arabic version of the WHOQOL-BREF used in the general population has been shown to have good internal consistency with a Cronbach's alpha of 0.91 (Awadalla et al., 2007). In this study, Cronbach's alpha was 0.93 for baseline WHOQOL-BREF scores.

The Arabic versions of the HTQ and the HSCL were obtained and used with permission from the Documentation Centre of the Rehabilitation and Research Centre for Torture Victims in Copenhagen, Denmark. The Arabic version of the WHOQOL was obtained and used with permission from the World Health Organization in Geneva, Switzerland. The scales were administered before the first MBSG session (baseline), after the last session (post), and at a 10-month follow-up. Fifty-one of the 92 participants (55%) completed the follow-up.

Trauma exposure was measured using a checklist compiled by the clinical director in Gaza with questions related to experiences of being the target of military violence or witnessing military violence. Endorsement of individual items is given in Table 1. Exposure scores were calculated with each endorsed item being given a score of 1, and all of the items added together. The exposure checklist that was given at the beginning of the study asked about exposure in the previous two years. The time frame at follow-up included only the time between the post measurement and follow-up. It determined how much additional exposure occurred following the MBSG intervention.

Statistical Analysis

Table 1
Prevalence of Exposure to Military Violence

Exposure Item	Previous 2 years before baseline ($N = 92$)		Between baseline and follow-up ($N = 51$)	
	n	Valid %	*n*	Valid %
Target of military violence				
Neighborhood invaded	57	62.6	23	45.1
Family member injured	44	47.8	15	29.4
Family member killed	36	39.1	13	25.5
Land shoveled by military forces[a]	27	30.3	14	28.0
Deprived of medical care when in dire need	23	25.6	13	25.5
Imprisoned inside house by military forces	23	25.3	9	17.6
Shot	13	14.1	5	9.8
House bombarded by tanks[a]	12	13.0	10	19.6
Beaten at a military crossing point	10	10.9	6	11.8
House bombarded by aircraft[a]	4	4.4	4	7.8
Witnessing military violence				
Saw shootings in neighborhood	84	91.3	31	60.8
Saw strangers injured	74	80.4	29	58.0
Saw strangers killed	68	74.7	28	54.9
Saw friends injured	66	72.5	21	41.2
Saw friends killed	54	59.3	13	25.5
Saw a vehicle bombarded by aircraft	52	57.8	16	31.3
Saw family member exposed to beating at military crossing point	4	4.4	6	11.8

Note. For the valid percent, missing values are not included in the total. Missing values ranged from one to three answers for 11 baseline and one answer for two follow-up questions.
[a] Six participants endorsed two of the three questions regarding the demolition of houses or property, and one participant endorsed all three questions.

Table 2
Scores on PTSD, Depression, Anxiety, and QOL Outcome Measures and Contrasts at Baseline, Post, and Follow-Up Assessments

Measure	Baseline *M* (*SD*)	Post *M* (*SD*)	Follow-up *M* (*SD*)	Pairwise comparison finding*	MBSGs intraclass correlation coefficient	Effect size *d* (95% confidence interval) pre to post	Effect size *d* (95% confidence interval) pre to follow-up
Harvard Trauma Questionnaire (PTSD score)	2.8 (.3)	2.1 (.5)	2.1 (.6)	T1 > T2, T3	.37	1.71 (1.65 to 1.81)	1.64 (1.57 to 1.80)
Hopkins Symptom Checklist							
Anxiety Subscale	2.7 (.6)	2.0 (.6)	2.0 (.6)	T1 > T2, T3	.18	1.17 (1.05 to 1.30)	1.17 (1.05 to 1.34)
Depression Subscale	2.7 (.5)	2.1 (.6)	2.1 (.6)	T1 > T2, T3	.30	1.09 (.99 to 1.21)	1.12 (1.02 to 1.29)
WHOQOL-BREF							
Overall QOL	2.6 (1.1)	3.3 (1.0)	3.4 (1.0)	T2, T3 > T1	.13	.67 (.46 to .89)	.76 (.48 to .98)
Overall Health	3.1 (1.1)	3.6 (.9)	3.5 (.9)	T2, T3 > T1	.13	.50 (.32 to .72)	.39 (.14 to .61)
Physical Health	47.8 (15.5)	61.5 (15.7)	59.9 (15.6)	T2, T3 > T1	.28	.88 (−2.33 to 4.05)	.78 (−3.68 to 3.95)
Psychological	38.5 (17.2)	60.3 (17.1)	51.6 (20.3)	T2, T3 > T1; T2 > T3	.21	1.28 (−2.24 to 4.79)	.72 (−5.02 to 4.24)
Social Relationships	51.6 (23.2)	63.6 (20.4)	58.3 (20.2)	T2, T3** > T1	.11	.55 (−3.62 to 5.29)	.30 (−5.24 to 5.04)
Environment	36.3 (13.3)	48.2 (16.6)	35.4 (15.0)	T2 > T1, T3	.29	.80 (−2.60 to 3.51)	.07 (−2.65 to 4.31)

Note. For baseline: $n = 92$ for all scales except Anxiety and Overall QOL, where $n = 91$. For Post: $n = 92$ for all scales except Overall QOL, Overall Health, and Psychological Health, where $n = 91$. For Follow-up: $n = 51$ for all scales except Overall QOL and Overall Health, where $n = 50$; Psychological Health and Environment, where $n = 48$; and Physical Health, where $n = 47$. T1 = Baseline; T2 = Post; T3 = Follow-up. PTSD = posttraumatic stress disorder; QOL = quality of life; WHOQOL-BREF = World Health Organization Quality of Life Scale-abbreviated version.
* $p < .01$ for all comparisons unless noted otherwise. ** $p < .05$.

Data for missing questions for the HTQ were imputed with the Expectation/Maximization (EM) algorithm using SYSTAT (v.12.02). The percent of missing questions as a function of the total questions for the HTQ was 0.3%. When a question was missing on either the anxiety or depression subscales of the HSCL, the score was calculated by adding the response for each of the answered questions and dividing by the number of questions answered rather than by the total number of questions.

The question that was missing most frequently was a question on the loss of sexual interest or pleasure on the HSCL and accounted for 67% of the missing depression questions. As expected, there were significant differences in participants choosing not to answer this question as compared to those answering. Those not answering were, for the most part, younger, unmarried women. Even with this missing item, the rate of missing data for the HSCL overall was only 0.4%. Missing data for the WHOQOL-BREF was calculated according to the guidelines in the manual (WHOQOL Group, 1996). Namely, when an item was missing, the mean of the other items in that domain was substituted. The question on satisfaction with one's sexual life on the WHOQOL-BREF comprised 30% of the missing questions. The percent of missing questions as a function of the total questions for the WHOQOL-BREF was 0.4%.

Linear mixed effects models analysis was performed using SAS/STAT PROC MIXED version 9.2 for the per-protocol analysis. Linear mixed effects models analysis was performed using IBM Statistics SPSS version 22 for the intent-to-treat analysis and for the comparison of those lost to follow-up versus those who completed follow-up. Because the intervention is administered in a group setting, the intraclass correlation coefficients (ICCs) for the MBSGs were calculated to determine the extent to which group members' responses are correlated to each other. The ICC values (shown in Table 2) range from 0.11 to 0.37. These values indicate that there was a dependency among group members. Therefore, for both the per-protocol and intent-to-treat analysis, a three-level (i.e., MBSG, individual, time) repeated model was run with MBSGs included as a random effect and with each group having its own intercept. An initial model for each of the dependent variables included time, sex, and baseline scores as fixed effect covariates; the individual MBSGs as a random effect; and a repeated effect for individuals across time. An interaction model included the above random effect and fixed effects in addition to Sex Time interactions. Pairwise comparisons of changes in outcome measures across time were performed.

An additional analysis was done on significant Sex Time interactions using the Mann–Whitney test. Differences in pre- to postscore changes, baseline scores, and sex, between participants completing follow-up and those lost to follow-up, were analyzed with the initial repeated measure model described above. Group (i.e., followed up vs. not followed up) was added as a fixed factor, and Group Time, Group Sex, and Group Baseline scores were also included as interactions. The correlation between exposure and baseline PTSD scores was calculated using the Spearman correlation. The Spearman correlation, the

Wilcoxon signed-ranks test, and Mann–Whitney test were performed using Analyse-It for Microsoft Excel (v 2.22).

Results

PTSD and Trauma Exposure

There was a statistically significant correlation between baseline PTSD scores and exposure to military violence (rs .41, p .0001). The follow-up exposure questions measured additional trauma exposure that had occurred in the intervening months between the intervention and follow-up (see Table 1). Trauma exposure was significantly (p .0001) higher in the two years prior to the intervention (7.8 [3.2]) than between baseline and follow-up (4.2 [3.5]). However, as indicated, participants continued to be exposed to traumatic events during the 10-month follow-up.

PTSD, Depression, and Anxiety

The linear mixed effects models analysis showed a significant effect of time for PTSD, $F(2, 183)$ 81.51, p .0001; depression, $F(2, 183)$ 46.56, p .0001; and anxiety, $F(2, 180)$ 58.45, p .0001. There was also a significant association between the dependent variable and its baseline score: PTSD, $F(1, 183)$ 32.03, p .0001; depression, $F(2, 183)$ 108.62, p .0001; and anxiety, $F(2, 180)$ 60.66, p .0001, indicating that higher baseline scores resulted in greater improvements in these outcomes following the MBSGs. There was no significant effect of sex by time in the interaction models, indicating that the MBSGs were equally effective in men and women for improving PTSD, depression, and anxiety symptoms. Pairwise comparisons showed that the PTSD, depression, and anxiety scores significantly improved following the MBSGs and that these improvements were fully maintained at 10-month follow-up (see Table 2). The intent-to-treat analysis for the PTSD, anxiety, and depression outcomes above, as well as the QOL outcomes below, showed the same results as the per-protocol analysis.

QOL

The linear mixed effects models analysis showed a significant effect of time on the overall QOL and health scores and the five domains of the WHOQOL-BREF: overall QOL, $F(2, 180)$ 15.16, p .0001; overall health, $F(2, 181)$ 8.35, p .0001; physical health, $F(2, 179)$ 33.36, p .0001; psychological, $F(2, 179)$ 57.33, p .0001; social relationships, $F(2, 183)$ 10.82, p .0001; and environment, $F(2, 180)$ 27.00, p .0001.

There was also a significant effect of the dependent variable baseline scores on the overall QOL, $F(1, 180)$ 130.33, p .0001; overall health, $F(1, 181)$ 176.19, p .0001; physical health, $F(1, 179)$ 109.13, p .0001; psychological, $F(1, 179)$ 96.07, p .0001; social relationships, $F(1, 183)$ 118.67, p .0001; and environment, $F(1, 180)$ 55.95, p .0001, indicating that lower baseline scores resulted in greater improvements in all the scales of the WHOQOL-BREF following the MBSGs.

The Sex Time interaction was significant for the physical health domain, $F(2, 177)$ 4.36, p .0142. Further analysis of these results showed that the men's baseline scores were significantly lower (i.e., worse) than the women's scores (41.1 [14.1] in men vs. 52.7 [14.7] in women; U 595; p .0005). There was no significant difference in the post or follow-up scores for men and women; given the lower baseline for the men, there was a greater post improvement in the men's scores compared to women.

Pairwise comparisons showed that the overall QOL and health scores and all of the QOL domain scores significantly improved following the MBSGs. These improvements were fully maintained at follow-up for the overall QOL and health scores and for the physical health and social relationships domains. The follow-up score remained significantly lower than baseline, but improvement was not entirely maintained for the psychological domain. Improvement was not at all maintained for the environment domain, where there was no significant difference between the pre and follow-up scores (see Table 2).

Effect Sizes

Effect sizes were measured using Cohen's d where 0.2 small, 0.5 medium, and 0.8 large effect sizes (Cohen, 1988). The effect sizes with 95% confidence intervals (CIs) are shown in Table 2. The PTSD, anxiety, and depression measures all had large effect sizes from pre to post and from pre to follow-up. Effect sizes were also large for the following domains of the WHOQOL- BREF: psychological, physical health, and environment pre to post. Medium effect sizes were measured for the following domains of the WHOQOL-BREF: overall

QOL pre to post and post to follow-up; overall health pre to post; physical health and psychological post to follow-up; and social relationships pre to post. Because the environment scores at follow-up were slightly worse than baseline, this effect size was below the small effect cut-off of 0.2.

Differences in Those Completing Follow-up

There was a significant Group Time interaction for PTSD, $F(1, 90)$ 6.03, p .016; anxiety, $F(1, 89)$ 7.72, p .019; and overall QOL, $F(1, 89)$ 5.40, p .023. The change in pre to post scores showed significantly more improvement in the participants not lost to follow-up compared to those who were lost to follow-up. The only outcome with a significant Group Baseline interaction was overall QOL, $F(1, 82)$ 4.35, p .040. The initial scores were lower (i.e., worse) in the group not lost to follow-up: 2.5 (1.1) versus 2.9 (1.0). There was no significant Group Sex interaction indicating that there was no difference in men versus women who were lost to follow-up.

Discussion

The results of this pilot study showed that adults participating in the MBSG program in Gaza had significantly reduced PTSD, depression, and anxiety symptoms and improvements in QOL. These results were similar to those obtained in several previous studies that investigated the MBSG effect on symptoms of PTSD and depression (Staples et al., 2011). These improvements were maintained at 10-month follow-up for the PTSD, depression, and anxiety symptoms; for overall QOL and health; and for the physical health and social relationship domains of QOL. Improvement was partially maintained for the psychological QOL domain. This maintenance of gains was particularly noteworthy because it occurred in spite of substantial population-wide stress.

The 18% rate of PTSD in adults in this study, as determined by *DSM–IV* criteria (according to the baseline symptom scores on the HTQ), is similar to the 20%–23% rate (combined men and women) reported by other investigators (Canetti et al., 2010; Punamäki, Komproe, Qouta, Elmasri, & de Jong, 2005). In this study, there was, as well, a significant correlation between the levels of exposure to military violence in the two years prior to the study and baseline PTSD scores.

Data were analyzed from the adults who met the qualifying PTSD criteria described above, so the initial levels were 100%. After participating in the MBSGs, PTSD levels, according to these criteria, dropped to 17.4%. At 10-months follow-up, PTSD levels were 33.3%. Improvements in depression and anxiety were also highly significant. Here, as with PTSD, those with the highest baseline scores showed most improvement.

Though there have been a number of studies of interventions with Gaza's war traumatized children, there are very few studies of any interventions with its war-traumatized adults. This lack of prior adult research and clinical interest possibly reflects the prevalent concern for children (rather than adults) in Gaza. It may also be related to the stigma that adults feel about admitting to psychological symptoms, and their reluctance to participate in mental health interventions.

The significant increases in measures of QOL including overall health, physical health, and psychological health suggest a global reduction in stress with a variety of benefits. The similar significant improvement in social relationships possibly attests to the supportive nature of the groups. Many participants reported having felt terribly isolated by their trauma as well as by their physical and emotional symptoms (anxiety, irritability, etc.) it produced.

There was a greater improvement in the QOL physical health domain in men compared to women, perhaps because of lower physical health baseline scores in men. Differences between QOL- related physical health in previous studies of men and women are not consistent. One study found that female veterans reported poorer physical health than their male counterparts (Schnurr & Lunney, 2008). Two other studies, one done in a Palestinian population (Hobfoll et al., 2012) and another in U.S. veterans (Skinner et al., 1999), found that women reported better physical health than men. The poorer physical health baseline scores for men in this study may be because men in Gaza, although psychologically traumatized, are more likely than women to seek help for physical problems.

The environment domain includes physical environment and living conditions, access to health services, transportation, physical safety, and financial security (WHOQOL Group, 1996). These possibly received a lower rating at follow-up

because the follow-up was done during the tension-filled run-up to Operation Cast Lead, the Israeli invasion of late 2008.

Several factors possibly contributed to the effectiveness of the MBSGs, as previously discussed (Gordon et al., 2008; Staples et al., 2011). The basic concentrative meditation technique (similar to transcendental meditation) of slow deep "soft belly" breathing gives participants the opportunity to learn and use a simple skill for quieting the SNS's fight or flight. It is likely that soft belly, like other meditations, also helps to quiet activity in the amygdala (Desbordes et al., 2012) and enhances functioning in the prefrontal cortex (Zeidan, Martucci, Kraft, McHaffie, & Coghill, 2014). This may have improved interoception (Lazar et al., 2005) and enhanced executive functioning (Kaplan & Berman, 2010). The combination of these changes may have allowed participants to have greater perspective on their symptoms (anxiety, agitation, and anger, as well as nightmares and recurring, frightening memories) and their situation. They may have contributed to a more relaxed and aware state in which participants were able to make more effective use of imaginative and exploratory techniques (La Forge, 2004), including guided imagery, drawings, written exercises, biofeedback, autogenic training, and genograms. Guided imagery, for example, appeared to enhance participants' ability to solve emotional and cognitive problems as well as lower their level of stress.

Physical techniques, like shaking and dancing and fast deep breathing, are used in many of the sessions. They may help participants to break up the restrictive patterns that are often present in traumatized people (van der Kolk, 2006). The genograms allow participants to discover strengths as well as vulnerabilities in their family histories and to become aware of family patterns that may inspire and support their recovery (e.g., an ancestor's overcoming of similar trauma), as well as to identify family members to whom they can turn for support.

Participants who learn a variety of techniques are able to select and continue to practice those which seem most appropriate and effective for each of them. One may report preferring regular shaking and dancing to release anger, while another may use guided imagery to quiet stress and look at and discover intuitive solutions to daily problems. The emphasis on self-care in the groups, as well as the specific techniques, potentially gave participants a new experience of being able to reduce symptoms and solve problems. The entire MBSG experience is thought to offer them encouragement to continue what they had learned to help themselves on an ongoing basis. The significant maintenance of improvements in PTSD, depression, and quality of life at follow-up appears to substantiate this.

The social support offered by the small group is almost certainly important. It appears that when participants feel comfortable and safe in these groups, they are able, often for the first time, to share their traumatic experiences. This may represent a version of exposure therapy, one in which each participant controls the time of revealing, sharing, and discussing traumatic events (van Der Kolk, 2014). The importance of social support in relieving psychosocial distress has been demonstrated in a model in Palestinian adults exposed to political violence (Hobfoll et al., 2012). Social support provided by the MBSGs is thought to be a key factor in reducing PTSD and depression symptoms (i.e., psychological distress), which in turn may have mediated the improvement in overall health on the WHOQOL-BREF scale. These effects of social support were described in the mediation model by Hobfoll et al. (2012).

The overall health measured in this study is a very similar construct to the subjective health in the mediation model. It is noted that in the mediation model the psychological distress was measured at 6-month follow-up and subjective health was measured at 12-month follow-up. However, it appears that the benefits provided by social support in the MBSGs were not limited to long-term improvement. They had the advantage of producing both immediate and long-term gains as demonstrated by the significant improvements in PTSD, depression, and overall health measured immediately after the MBSGs as well as at follow-up.

Although the mind–body approach has some elements in common with cognitive therapies, (e.g., using relaxation techniques to gain perspective on thoughts) and can be used in conjunction with them, the emphasis here is more on sharing feelings and developing imaginative capabilities, as well as using movement and exercise. According to participants, MBSGs provide immediate gratification and a sense of achievement and control as well as tools for ongoing use.

The main limitation of this study was the lack of a control group. Without a control group, it is not possible to definitively determine if improvement may have been due to the passage of time (a particular issue with depression), a placebo effect, or simply the social support provided by the groups. During this particularly difficult time in Gaza, performing a randomized controlled trial would have been extremely challenging and complicated. There were frequent Israeli incursions, which disrupted daily activities as well as threatened lives. Both water and power were scarce. The Gaza organization was focused on providing services as quickly and efficiently as possible to the large numbers of traumatized people who were seeking help. We chose, therefore, to do this as a pilot study to see if the results we had obtained with children (Staples et al., 2011) could be replicated with adults.

Another limitation is missing data at follow-up. The analysis of the pre to post differences in outcome measure scores between those lost to follow-up and those not lost to follow-up showed that those not lost to follow-up had significantly more pre to post improvement in the PTSD, anxiety, and overall quality of life. Therefore, some bias may have been introduced into the follow-up results. Participants who had more improvement may have been more willing to respond and may have skewed the follow-up results in a positive direction.

In an extensive review of PTSD treatments published by the Institute of Medicine, missing data was cited as a common issue with typically 20% to 50% of patients dropping out of these studies (Institute of Medicine, 2008). Mixed-model repeated measurement is a recommended analytical approach to handling missing data (Institute of Medicine, 2008) and was used in this study. The missing follow-up data was a problem in Gaza for several reasons: Many of the local NGOs in which the groups had been held were closed because of violence and fear of invasion during the follow-up period; there was a lack of fuel for transportation for participants to meet with investigators; and a number of participants had moved away from areas of conflict and could not be located. In addition, during the chaos just preceding Operation Cast Lead, one group leader who had run three groups lost the

participants' contact information; another who led one group died; and a third leader, who ran one group, left for Egypt.

Finally, we did not differentiate whether the traumatic event exposure was from military violence or other causes such as loss of a family relative (unrelated to violence), history of abuse, anxiety, depression, or unemployment. However, as Table 1 shows, nearly all of the participants with qualifying PTSD criteria had considerable exposure to military violence.

Results of this study suggested that a comprehensive but brief MBSG program for adults can result in a significant decrease in symptoms of PTSD and depression and improvement in quality of life. This study, with adults in Gaza, supports earlier studies of the effectiveness of this model with children in both Kosovo and Gaza (Gordon et al., 2004, 2008; Staples et al., 2011). The present study shows that this model can work as well with Palestinian adults as it has with children. The MBSG model, which is easily taught to health professionals, educators, aid workers, and leaders of women's and other community groups, can be integrated into a wide range of services and made available to whole populations that have been traumatized by war and other disasters.

Over 10 years, word-of-mouth testimonials as well as published research have made the MBSGs extremely popular in Gaza. At the present time the Ministries of Education and Health, as well as the UNRWA, are hopeful of making MBSGs available to all school- children and teachers as well as including them in primary health care clinics. The authors hope, as we continue to provide MBSGs to a larger number of Palestinians as well as in other situations of population-wide trauma, to publish randomized controlled trials as well as qualitative research on the effect of these approaches.

References

American Psychiatric Association. (1994). *Diagnostic and statistical man- ual of mental disorders* (4th ed.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical man- ual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Astin, J. A., Shapiro, S. L., Eisenberg, D. M., & Forys, K. L. (2003). Mind– body medicine: State of the science, implications for practice. *The Journal of the American Board of Family Practice, 16,* 131–147. http:// dx.doi.org/10.3122/jabfm.16.2.131

Awadalla, A. W., Ohaeri, J. U., Gholoum, A., Khalid, A. O., Hamad, H. M., & Jacob, A. (2007). Factors associated with quality of life of outpatients with breast cancer and gynecologic cancers and their family caregivers: A controlled study. *BMC Cancer, 7,* 102. http://dx.doi.org/ 10.1186/1471-2407-7-102

Canetti, D., Galea, S., Hall, B. J., Johnson, R. J., Palmieri, P. A., & Hobfoll, S. E. (2010). Exposure to prolonged socio-political conflict and the risk of PTSD and depression among Palestinians. *Psychiatry: Interpersonal and Biological Processes, 73,* 219–231. http://dx.doi.org/10.1521/psyc .2010.73.3.219

Chalmers, J. A., Quintana, D. S., Abbott, M. J., & Kemp, A. H. (2014). Anxiety disorders are associated with reduced heart rate variability: A meta-analysis. *Frontiers in Psychiatry, 5,* 80. http://dx.doi.org/10.3389/ fpsyt.2014.00080

Cohen, H., Benjamin, J., Geva, A. B., Matar, M. A., Kaplan, Z., & Kotler, M. (2000). Autonomic dysregulation in panic disorder and in post- traumatic stress disorder: Application of power spectrum analysis of heart rate variability at rest and in response to recollection of trauma or panic attacks. *Psychiatry Research, 96,* 1–13. http://dx.doi.org/10.1016/ S0165-1781(00)00195-5

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

de Jong, J. T., Komproe, I. H., Van Ommeren, M., El Masri, M., Araya, M., Khaled, N., . . . Somasundaram, D. (2001). Lifetime events and post- traumatic stress disorder in 4 postconflict settings. *JAMA: Journal of the American Medical Association, 286,* 555–562. http://dx.doi.org/10.1001/ jama.286.5.555

Desbordes, G., Negi, L. T., Pace, T. W., Wallace, B. A., Raison, C. L., & Schwartz, E. L. (2012). Effects of mindful-attention and compassion meditation training on amygdala response to emotional stimuli in an ordinary, non-meditative state. *Frontiers in Human Neuroscience, 6,* 292. http://dx.doi.org/10.3389/fnhum.2012.00292

Gordon, J. S. (2014). Mind–body skills groups for medical students: Reducing stress, enhancing commitment, and promoting patient- centered care. *BMC Medical Education, 14,* 198. http://dx.doi.org/10 .1186/1472-6920-14-198

Gordon, J. S., Staples, J. K., Blyta, A., & Bytyqi, M. (2004). Treatment of posttraumatic stress disorder in postwar Kosovo high school students using mind–body skills groups: A pilot study. *Journal of Traumatic Stress, 17,* 143–147. http://dx.doi.org/10.1023/B:JOTS.0000022620 .13209.a0

Gordon, J. S., Staples, J. K., Blyta, A., Bytyqi, M., & Wilson, A. T. (2008). Treatment of posttraumatic stress disorder in postwar Kosovar adoles- cents using mind–body skills groups: A randomized controlled trial. *Journal of Clinical Psychiatry, 69,* 1469–1476. http://dx.doi.org/10 .4088/JCP.v69n0915

Gordon, J. S., Staples, J. K., Hamilton, M., & Uddo, M. (2016). *Mind– body skills groups for the treatment of posttraumatic stress disorder symptoms in military and veteran populations: A randomized controlled study*. Manuscript in preparation.

Hedges, D. W., & Woon, F. L. M. (2007). Structural magnetic resonance imaging findings in posttraumatic stress disorder and their response to treatment: A systematic review. *Current Psychiatry Reviews, 3,* 85–93. http://dx.doi.org/10.2174/157340007780599078

Hobfoll, S. E., Hall, B. J., & Canetti, D. (2012). Political violence, psychological distress, and perceived health: A longitudinal investiga- tion in the Palestinian Authority. *Psychological Trauma: Theory, Re- search, Practice, and Policy, 4,* 9–21. http://dx.doi.org/10.1037/ a0018743

Hölzel, B. K., Ott, U., Gard, T., Hempel, H., Weygandt, M., Morgen, K., & Vaitl, D. (2008). Investigation of mindfulness meditation practitioners with voxel-based morphometry. *Social Cognitive and Affective Neuro- science, 3,* 55–61. http://dx.doi.org/10.1093/scan/nsm038

Institute of Medicine, Committee on Treatment of Posttraumatic Stress Disorder. (2008). *Treatment of posttraumatic stress disorder: An assess- ment of the evidence*. Washington, DC: The National Academies Press.

Jing, X., Wu, P., Liu, F., Wu, B., & Miao, D. (2011). Guided imagery, anxiety, heart rate, and heart rate variability during centrifuge training. *Aviation, Space, and Environmental Medicine, 82,* 92–96. http://dx.doi .org/10.3357/ASEM.2822.2011

Kanninen, K., Punamäki, R. L., & Qouta, S. (2002). The relation of appraisal, coping efforts, and acuteness of trauma to PTS symptoms among former political prisoners. *Journal of Traumatic Stress, 15,* 245–253. http://dx.doi.org/10.1023/A:1015211529584

Kaplan, S., & Berman, M. G. (2010). Directed attention as a common resource for executive functioning and self-regulation. *Perspectives on Psychological Science, 5,* 43–57. http://dx.doi.org/10.1177/174569 1609356784

Kasai, K., Yamasue, H., Gilbertson, M. W., Shenton, M. E., Rauch, S. L., & Pitman, R. K. (2008). Evidence for acquired pregenual anterior cingulate gray matter loss from a twin study of combat-related posttrau- matic stress disorder. *Biological Psychiatry, 63,* 550–556. http://dx.doi .org/10.1016/j.biopsych.2007.06.022

Kleijn, W. C., Hovens, J. E., & Rodenburg, J. J. (2001). Posttraumatic stress symptoms in refugees: Assessments with the Harvard Trauma Questionnaire and the Hopkins symptom Checklist-25 in different lan- guages. *Psychological Reports, 88,* 527–532. http://dx.doi.org/10.2466/ pr0.2001.88.2.527

La Forge, P. G. (2004). Cultivating moral imagination through meditation. *Journal of Business Ethics, 51,* 15–29. http://dx.doi.org/10.1023/B:BUSI .0000032372.35668.83

Lazar, S. W., Kerr, C. E., Wasserman, R. H., Gray, J. R., Greve, D. N., Treadway, M. T., . . . Fischl, B. (2005). Meditation experience is associated with increased cortical thickness. *Neuroreport, 16,* 1893– 1897. http://dx.doi.org/10.1097/01.wnr.0000186598.66243.19

Llosa, A. E., Casas, G., Thomas, H., Mairal, A., Grais, R. F., & Moro, M. R. (2012). Short and longer-term psychological consequences of Operation Cast Lead: Documentation from a mental health program in the Gaza Strip. *Conflict and Health, 6,* 8. http://dx.doi.org/10.1186/ 1752-1505-6-8

McGrady, A. (1994). Effects of group relaxation training and thermal biofeedback on blood pressure and related physiological and psycholog- ical variables in essential hypertension. *Biofeedback and Self- Regulation, 19,* 51–66. http://dx.doi.org/10.1007/BF01720670

McLay, R. N., Wood, D. P., Webb-Murphy, J. A., Spira, J. L., Wiederhold, M. D., Pyne, J. M., & Wiederhold, B. K. (2011). A randomized, controlled trial of virtual reality-graded exposure therapy for post- traumatic stress disorder in active duty service members with combat- related post-traumatic stress disorder. *Cyberpsychology, Behavior, and Social Networking, 14,* 223–229. http://dx.doi.org/10.1089/cyber.2011 .0003

Möhlen, H., Parzer, P., Resch, F., & Brunner, R. (2005). Psychosocial support for war-traumatized child and adolescent refugees: Evaluation of a short-term treatment program. *Australian and New Zealand Journal of Psychiatry, 39,* 81–87. http://dx.doi.org/10.1080/j.1440-1614.2005 .01513.x

Mollica, R. F., Caspi-Yavin, Y., Bollini, P., Truong, T., Tor, S., & Lavelle, J. (1992). The Harvard Trauma Questionnaire: Validating a cross-cultural instru- ment for measuring torture, trauma, and posttraumatic stress disorder in Indo- chinese refugees. *Journal of Nervous and Mental Disease, 180,* 111–116. http://dx.doi.org/10.1097/00005053-199202000-00008

Mollica, R. F., McDonald, L. S., Massagli, M. P., & Silove, D. M. (2004).

Measuring trauma, measuring torture: Instructions and guidance on the utilization of the Harvard Program in Refugee Trauma's version of the Hopkins Symptom Checklist - 25 (HSCL-25) & the Harvard Trauma Questionnaire (HTQ). Cambridge, MA: Harvard Program in Refugee Trauma.

Mollica, R. F., McInnes, K., Sarajlic´, N., Lavelle, J., Sarajlic´, I., & Massagli, M. P. (1999). Disability associated with psychiatric comor- bidity and health status in Bosnian refugees living in Croatia. *JAMA: Journal of the American Medical Association, 282,* 433–439. http://dx .doi.org/10.1001/jama.282.5.433

Mollica, R. F., Wyshak, G., de Marneffe, D., Khuon, F., & Lavelle, J. (1987). Indochinese versions of the Hopkins Symptom Checklist-25: A screening instrument for the psychiatric care of refugees. *The American Journal of Psychiatry, 144,* 497–500. http://dx.doi.org/10.1176/ajp.144 .4.497

National Institutes of Health. (1992). *Alternative medicine: Expanding medical horizons: A report to the NIH on alternative medical systems and practices in the US, prepared under the auspices of the workshop on alternative medicine* (NIH Publication No. 94–066). Chantilly, VA: Author. http://dx.doi.org/10.1016/S0006-3223(99)00009-8

National Institutes of Health. (2010). *Fact sheet – Mind–body medicine practices in complementary and alternative medicine*. Retrieved from http://report.nih.gov/nihfactsheets/Pdfs/MindBodyMedicinePracticesin ComplementaryandAlternativeMedicine(NCCAM).pdf

Punamäki, R.-L., Komproe, I. H., Qouta, S., Elmasri, M., & de Jong, J. T. (2005). The role of peritraumatic dissociation and gender in the associ- ation between trauma and mental health in a Palestinian community sample. *American Journal of Psychiatry, 162,* 545–551. http://dx.doi .org/10.1176/appi.ajp.162.3.545

Rees, B., Travis, F., Shapiro, D., & Chant, R. (2013). Reduction in posttraumatic stress symptoms in Congolese refugees practicing tran- scendental meditation. *Journal of Traumatic Stress, 26,* 295–298. http:// dx.doi.org/10.1002/jts.21790

Rosenthal, J. Z., Grosswald, S., Ross, R., & Rosenthal, N. (2011). Effects of transcendental meditation in veterans of Operation Enduring Freedom and Operation Iraqi Freedom with posttraumatic stress disorder: A pilot study. *Military Medicine, 176,* 626 – 630. http://dx.doi.org/10.7205/ MILMED-D-10-00254

Schnurr, P. P., & Lunney, C. A. (2008). Exploration of gender differences in how quality of life relates to posttraumatic stress disorder in male and female veterans. *Journal of Rehabilitation Research and Development, 45,* 383–394. http://dx.doi.org/10.1682/JRRD.2007.06.0099

Schweitzer, R., Melville, F., Steel, Z., & Lacherez, P. (2006). Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. *Australian and New Zealand Journal of Psychiatry, 40,* 179–187. http://dx.doi.org/10 .1080/j.1440-1614.2006.01766.x

Shin, L. M., & Liberzon, I. (2010). The neurocircuitry of fear, stress, and anxiety disorders. *Neuropsychopharmacology, 35,* 169–191. http://dx .doi.org/10.1038/npp.2009.83

Shin, L. M., Rauch, S. L., & Pitman, R. K. (2006). Amygdala, medial prefrontal cortex, and hippocampal function in PTSD. *Annals of the New York Academy of Sciences, 1071,* 67–79. http://dx.doi.org/10.1196/ annals.1364.007

Skinner, K., Sullivan, L. M., Tripp, T. J., Kressin, N. R., Miller, D. R., Kazis, L., & Casey, V. (1999). Comparing the health status of male and female veterans who use VA health care: Results from the VA Women's Health Project. *Women & Health, 29,* 17–33. http://dx.doi.org/10.1300/ J013v29n04_02

Smyth, J. M., Hockemeyer, J. R., & Tulloch, H. (2008). Expressive writing and post-traumatic stress disorder: Effects on trauma symptoms, mood states, and cortisol reactivity. *British Journal of Health Psychology, 13,* 85–93. http://dx.doi.org/10.1348/135910707X250866

Staples, J. K., Abdel Atti, J. A., & Gordon, J. S. (2011). Mind–body skills groups for posttraumatic stress disorder and depression symptoms in Palestinian children and adolescents in Gaza. *International Journal of Stress Management, 18,* 246–262. http://dx.doi.org/10.1037/a0024015

Staples, J. K., & Gordon, J. S. (2005). Effectiveness of a mind– body skills training program for healthcare professionals. *Alternative Therapies in Health and Medicine, 11,* 36–41.

Tol, W. A., Komproe, I. H., Susanty, D., Jordans, M. J., Macy, R. D., & De Jong, J. T. (2008). School-based mental health intervention for children affected by political violence in Indonesia: A cluster randomized trial. *JAMA: Journal of the American Medical Association, 300,* 655–662. http://dx.doi.org/10.1001/jama.300.6.655

van der Kolk, B. A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of the New York Academy of Sciences, 1071,* 277–293. http://dx.doi.org/10.1196/annals.1364.022

van Der Kolk, B. (2014). *The body keeps the score: Brain, mind, and body in the healing of trauma*. New York, NY: Penguin.

WHOQOL Group. (1996). *WHOQOL-BREF introduction, administration, scoring and generic version of the instrument*. Geneva, Switzerland: Programme on Mental Health, World Health Organization.

WHOQOL Group. (1998). Development of the World Health Organization WHOQOL-BREF quality of life assessment. *Psychological Medicine, 28,* 551–558. http://dx.doi.org/10.1017/S0033291798006667

Zeidan, F., Martucci, K. T., Kraft, R. A., McHaffie, J. G., & Coghill, R. C. (2014). Neural correlates of mindfulness meditation-related anxiety re- lief. *Social Cognitive and Affective Neuroscience, 9,* 751–759. http://dx .doi.org/10.1093/scan/nst041