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A Longitudinal Study of Posttraumatic Stress Disorder, Depression, and Generalized Anxiety Disorder in Israeli Civilians Exposed to War Trauma

Yuval Neria
College of Physicians and Surgeons and New York State Psychiatric Institute

Avi Besser
Center for Research in Personality, Life Transitions, and Stressful Life Events, Sapir Academic College

Dasha Kiper
Teachers College, Columbia University

Maren Westphal
College of Physicians and Surgeons and New York State Psychiatric Institute

This 3-wave longitudinal study examined the mental health consequences of the Israel–Gaza 2008–2009 war among young Israeli civilians. Data on posttraumatic stress disorder (PTSD), major depressive disorder (MDD), and generalized anxiety disorder (GAD), and their predictors were collected during the war, and 2 and 4 months after ceasefire. Results showed a sharp decline in symptom levels of PTSD, MDD, and GAD over time. Perceived social support during the war moderated the effects of immediate emotional response on subsequent levels of PTSD, MDD, and GAD. These findings underscore the importance of social support and immediate emotional response to trauma in predicting trauma-related psychopathology, and highlight the potential need for providing early care to exposed individuals exhibiting immediate and severe emotional responses.

Large populations in the Middle East have been exposed to war trauma, including ongoing threat to life, displacement, and disruptions in social networks. Israeli and Palestinian civilians on both sides of the Gaza–Israel border recently witnessed a severe escalation in the ongoing conflict (Besser & Neria, 2009; Besser, Neria, & Haynes, 2009; Besser & Priel, 2010), culminating in a large-scale war between Hamas-led military organizations and the Israeli military. The war lasted 22 days (December 27, 2008 through January 17, 2009) and involved an invasion of Israeli military forces into the Gaza Strip and the launching of large numbers of long-distance missiles and rockets from the Gaza border to various locations up to 40 km inside Israel (Besser & Neria, in press). The current study aimed to evaluate longitudinally, during the war and 2 and 4 months after the ceasefire, the mental health sequelae of this conflict in a sample of young adults in southern Israel.

Ample research exists on mental health consequences of war exposure among Israeli populations, although most studies have been cross-sectional and the few prospective studies that have been performed were limited to two time points. Estimates of posttraumatic stress disorder (PTSD) and depression among these populations vary. The following estimates of PTSD have been reported: 7% (Palmieri, Canetti-Nisim, Galea, Johnson, & Hobfoll, 2008), 21% (Shalev, Tuval, Frenkiel-Fishman, Hadar, & Eth, 2006), 26% (Hall et al., 2008), and 27% (Besser & Neria, 2009). Estimates of depression vary from 17% (Hall et al., 2008) to 59% (Bleich, Gelkopf, & Solomon, 2003). In a 2-year follow-up study of the effects of the Al Aqsa Intifada, Bleich and colleagues found a stable level of PTSD symptoms across two time points (9%), but a sharp decline in depression, from 59% (Bleich et al., 2003) to 29% (Bleich, Gelkopf, Melamed, & Solomon, 2006). However, comparisons between these studies are complicated by differences in type of exposure, time of assessment, and measures of psychopathology.

Few studies have addressed the possibility that exposure to terrorism and war may be associated with elevated levels of exaggerated and uncontrollable worries, above and beyond PTSD

Yuval Neria, Department of Psychiatry, College of Physicians and Surgeons, Columbia University; Avi Besser, Department of Behavioral Sciences, and Center for Research in Personality, Life Transitions, and Stressful Life Events, Sapir Academic College; Dasha Kiper, Teachers College, Columbia University; Maren Westphal, Department of Psychiatry, College of Physicians and Surgeons, Columbia University.

Correspondence concerning this article should be addressed to: Yuval Neria, Department of Psychiatry, Columbia University, 1051 Riverside Drive, Unit 69, NewYork, New York 10032. E-mail: ny126@columbia.edu. Or to Avi Besser, Department of Behavioral Sciences, Sapir Academic College, D. N. Hof Ashkelon 79165, Israel. E-mail: besser@mail.sapir.ac.il.

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and depression. We examined this possibility by expanding our research to include symptoms of generalized anxiety disorder (GAD), in addition to PTSD and major depressive disorder (MDD). Generalized anxiety disorder is relatively common; characterized by excessive and uncontrollable worrying, anxiety, hypervigilance, and numerous somatic symptoms of anxiety; and can be chronic and disabling (e.g., Kessler, Chiu, Demler, & Walters, 2005). Although GAD has never been studied in trauma-exposed Israeli populations, a small but growing body of literature has documented elevated levels of GAD among other populations exposed to disaster (e.g., Palinkas, Downs, Peterson, & Russell, 1993) and terrorism (Ghafoori et al., 2009).

Using a longitudinal 3-wave design and three mental health outcomes, our study aimed to examine the longitudinal associations of trauma exposure severity, perceived availability of social support during the war, and immediate emotional response during the war with subsequent PTSD, MDD, and GAD. Although the contribution of exposure severity to PTSD is well documented (see Galea, Nandi, & Vlahov, 2005; Neria, Nandi, & Galea, 2008; Norris et al., 2002 for reviews), a number of studies in Israeli populations have not found significant relations between severity of exposure and PTSD (e.g., Besser & Neria, in press; Bleich et al., 2003; Shalev et al., 2006). The longitudinal design of the current study and use of multiple mental health outcomes enabled us to explore these relations, thus extending knowledge of the mental health consequences of exposure to military conflict in a young civilian population.

The relation between immediate emotional response to trauma and subsequent psychopathology has received limited scientific attention, and has mostly been examined cross-sectionally (e.g., Roemer, Orsillo, Borkovec, & Litz, 1998). Thus far, only Brewin, Andrews, and Rose (2000) have used a longitudinal design to examine the association between immediate emotional response and PTSD. In that study, they found that the level of immediate emotional response is strongly related to the subsequent development of PTSD.

Our study was designed to examine the possibility that perceived availability of social support influences whether an immediate emotional response to trauma will develop into long-term and persistent psychopathology. Although a considerable body of literature concerning studies conducted in Israeli populations (e.g., Besser & Neria, in press; Besser & Priel, 2010) and elsewhere (e.g., Norris & Kaniasty, 1996; Thompson et al., 2000) suggests that perceived social support is a potent buffer against stress-induced emotional distress, to the best of our knowledge, no previous study has investigated the interaction between social support and immediate emotional response to war-related trauma.

The current study seeks to fill these gaps in knowledge through a longitudinal study conducted during the 2009 Israel–Gaza War and 2 and 4 months after the ceasefire, with a sample of young civilian students attending a college in southern Israel. By using information collected over the Internet, we sought (a) to examine symptom levels of PTSD, MDD, and GAD over time; and (b) to investigate the effects of exposure characteristics, immediate emotional response, and perceived social support during the war, and the interaction between immediate emotional response and perceived social support on symptom levels of PTSD, MDD, and GAD, as assessed over time.

METHOD

Participants and Procedure

The survey was conducted with Jewish, first-year undergraduate students from Sapir College, located 7 kilometers from the Israel–Gaza border, as part of a large longitudinal research program designed to study the mental health effects of the 2009 Israel–Gaza war. Because many of the participants had to evacuate the college at the beginning of the war, the study was administered via the university's "e-learn" Web system, enabling simultaneous and brief data collection, lasting no more than 24 hours at each time point regardless of the participant's location. Time 1 data was collected during the war (January 7, 2009), and Time 2 and Time 3 data were collected 2 months (March 10, 2009) and 4 months (May 10, 2009) after the ceasefire, respectively.

To recruit participants, personal e-mail invitations were sent to all students enrolled in an introductory psychology class ($N =$ 200; 170 women, 30 men). If they responded in the affirmative, they were asked to submit the completed survey within 24 hours in each of the three study waves. Participants received extra credit for their participation.

One hundred fifty students (75%) agreed to review the consent form. Of these, 135 participants provided consent and submitted the Time 1 survey. Of these, 134 submitted the Time 2 survey, and 133 of the participants at both Time 1 and Time 2 submitted the survey at Time 3, representing 67% of the sampling frame. We compared participants and nonparticipants, in terms of study demographics, and found no significant differences.

Measures

Severity of exposure to rocket and missile attacks before and during the war was assessed by asking each participant about the number of times he or she was exposed to attacks before and during the war. Importantly, due to the long-distance missiles used by Hamas (which reached up to 40 km from the Israel-Gaza border), most study participants continued to be exposed to potential life threat even after being evacuated from the war zone to their homes.

Immediate emotional response was assessed by asking participants whether they had experienced fearfulness and helplessness during the attack (yes/no).

The Multidimensional Scale of Perceived Social Support (MSPSS; Canty-Mitchell & Zimet, 2000) was used for perceived social support. The MSPSS is a 12-item questionnaire containing

three subscales. Each subscale consists of four items, measuring perceived availability of social support from friends, family, and a significant other. Items are scored on a 7-point Likert scale, ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*) for each item. For this study, we calculated an overall MSPSS score. This scale has been found to demonstrate high internal consistency in previous studies (e.g., Besser & Priel, 2010).

Three outcome measures, PTSD, MDD, and GAD, were assessed using validated screening measures that correspond to the *DSM-IV* criteria for these disorders according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (*DSM-IV*; American Psychiatric Association [APA], 1994).

PTSD was measured with a PTSD Inventory (Solomon et al., 1993) consisting of 17 items scored on a 4-point scale (1 = *not at all* to 4 = *extremely*). Respondents rated the extent to which they had been bothered by each symptom during the past month in relation to the Israel–Gaza war, allowing determination of prevalence of PTSD and assessment of symptom severity. The average score across all symptoms served as the overall PTSD symptom severity score. One reexperiencing, three avoidance, and two hyperarousal symptoms endorsed at 2 or higher yielded a probable diagnosis of PTSD (Solomon & Horesh, 2007). This scale has been found to demonstrate high internal consistency in previous studies (e.g., Neria, Solomon, & Dekel, 2000) as well as high convergent validity when compared with diagnoses based on structured clinical interviews (e.g., Solomon et al., 1993).

The Patient Health Questionnaire-9 (PHQ-9; Kroenke, Spitzer, & Williams, 2001) was used to assess current symptoms of MDD. This self-report scale comprises nine items relating to symptoms of depression as defined by the *DSM-IV*. Each of the items is scored from 0 to 3, resulting in a maximum total score of 27, with higher scores representing increased severity of depression. The assessment of the prevalence of MDD was based on the algorithm for the Prime-MD PHQ (cutoff $\geq$10; see Kroenke et al., 2001; Spitzer, Williams, & Kroenke, 1994).

The GAD-7, a seven-item, 4-point Likert-type scale, corresponding to *DSM-IV* criteria for GAD (Spitzer, Kroenke, Williams, & Lowe, 2006), was used to measure symptoms of GAD ranging from 0 (*not at all*) to 3 (*almost every day*), resulting in a maximum total score of 21, with higher scores representing increased severity of GAD symptoms. This scale has been found to have good reliability, as well as good criterion, construct, factorial, and procedural validity (Spitzer et al., 2006). The assessment of the prevalence of GAD was based on the algorithm for the GAD-7 (cutoff $\geq$15; see Spitzer et al., 2006).

Cronbach's alphas obtained in the present study for the multi-item scales at each assessment point are reported in Table 2.

Data Analysis

Descriptive statistics were first calculated for demographic and trauma-exposure variables. Then, prevalence and mean scores were calculated for PTSD, MDD, and GAD at the three time points. Next, repeated-measure ANOVAs were used to examine differences in the continuous scores of PTSD, MDD, and GAD (i.e., intensity of symptoms) between time points. This was followed by a series of bivariate analyses using zero-order Pearson (product moment) and point-biserial correlations between age, gender, trauma-exposure variables, immediate emotional response, social support during the war, and the study outcomes at each time point. We then conducted multivariate analyses using hierarchical multiple regressions with interactions represented by product terms (see Aiken & West, 1991) to examine the unique associations of immediate emotional response, social support, and the interactive associations of immediate emotional response and social support, with intensity of PTSD, MDD, and GAD symptoms at each of the three assessments. To control for collinearity of variables with their interaction terms, centered versions of each variable were calculated and interaction terms based on the centered variables were entered into a regression model. The multivariate analyses included only variables found to be significant in the bivariate analyses. Finally, to predict longitudinal changes in levels of outcomes, we conducted similar hierarchical multiple regressions, this time to predict scores of outcome measures at Time 2, controlling for corresponding outcomes measured at Time 1. Similarly, to predict outcome measures at Time 3, we controlled for the level of the outcome at Time 1 and Time 2. An alpha level of .05 was chosen a priori.

RESULTS

The sample consisted mostly of women (84%) and had a mean age of 24 years ($SD = 2$). On average, participants reported exposure to eight rocket or missile attacks before the war ($M = 8.1$, $SD = 13.3$) and five attacks during the war ($M = 4.7$, $SD = 11.4$). Eighty-three participants (61.5%) reported an immediate emotional response of fear and helplessness to the attacks.

Prevalence and Symptom Levels of PTSD, MDD, and GAD

Rates of prevalence of PTSD declined from 20.0% during the war to 3.0% and 2.2% at Time 2 and Time 3, respectively. Rates of prevalence of MDD declined from 45.2% during the war to 22.2% at Time 2 and Time 3. Rates of prevalence of GAD declined from 57.8% during the war to 21.5% and 12.6% at Time 2 and Time 3, respectively. The reductions in mean PTSD, MDD, and GAD symptom levels over time were significant (Table 1). As shown in Table 1, planned comparisons indicated significant decreases between Time 1 and Time 2 and between Time 1 and Time 3 for PTSD, MDD, and GAD ($p < .001$); and between Time 2 and Time 3 for GAD ($p < .001$).

Table 1. Means and Standard Deviations of PTSD, MDD, and GAD Symptoms at Three Time Points Among Civilians Exposed to the 2008–2009 Israel-Gaza War

	I Time 1[a]		II Time 2[b]		III Time 3[c]		Statistics			Time Contrasts (F)		
Variables	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	Effect size η_p^2	Observed power	1 vs. 2	2 vs. 3	1 vs. 3
PTSD	2.07	0.63	1.69	0.51	1.63	0.53	67.04***	.34	1.0	8.47***	1.83	10.10***
MDD	9.33	5.57	6.36	5.58	6.15	4.44	31.51***	.19	1.0	6.55***	<1	6.72***
GAD	11.14	5.65	5.95	4.66	4.47	4.34	117.10***	.47	1.0	10.91***	3.83***	13.39***

Note. PTSD = posttraumatic stress disorder; MDD = major depressive disorder; GAD = generalized anxiety disorder. $N = 133$ for all three time points.
[a]Time 1 = during the war (January 7, 2009), $n = 135$. [b]Time 2 = 2 months after the ceasefire (March 10, 2009), $n = 134$. [c]Time 3 = 4 months after the ceasefire (May 10, 2009), $n = 133$.
*** $p < .001$, two-tailed.

Bivariate Associations

Table 2 shows the zero-order Pearson (product moment) and point-biserial correlations of potential predictors with outcome variables. As shown in the table, age and number of rocket and missile attacks, both before and during the war, were not significantly associated with any of the outcome variables. Age was also not associated with number of attacks either before ($r = -.03$, *ns*) or during the war ($r = -.04$, *ns*), nor with immediate emotional response ($r = -.14$, *ns*) or social support during the war ($r = -.10$, *ns*). Significant negative associations were found between gender and PTSD and MDD at all three time points and with GAD at Time 1 and Time 3, with women reporting significantly higher levels of symptoms. Gender was also significantly associated with immediate emotional response to the attacks, χ^2 (1, $N = 135$) = 27.69, $p < .001$, with women reporting immediate emotional responses more frequently than men. Gender was not associated with exposure to the attacks before ($r = -.05$, *ns*) or during the war ($r = -.01$, *ns*), or with social support ($r = .11$, *ns*). Significant positive correlations were found between immediate emotional response and PTSD and MDD at all three time points and with GAD at Time 1 and Time 3, but not at Time 2. Perceived social support during the war was significantly inversely related to PTSD and GAD at all three time points and with MDD at Time 1 and Time 3, but not at Time 2. Perceived social support during the war was significantly associated with immediate emotional response ($r = -.18$, $p < .05$), but not with number of rockets falling before ($r = .08$, *ns*) or during the war ($r = -.04$, *ns*). No significant

Table 2. Bivariate Correlations Between Age, Gender, Exposure to Trauma, Immediate Emotional Response, Perceived Social Support During the War, and Symptoms of PTSD, MDD, and GAD at Three Time Points

	Age	Gender[a]	Number of rockets before war	Number of rockets during war	Immediate emotional response[b]	Perceived social support	Cronbach's α
PTSD–Time 1[c]	−.06	−.28***	−.14	−.03	.40***	−.62***	.87
PTSD–Time 2[d]	−.13	−.25**	.01	−.06	.32***	−.26**	.88
PTSD–Time 3[e]	−.14	−.21*	−.09	−.06	.26**	−.42***	.85
MDD–Time 1[c]	−.04	−.32***	−.11	−.00	.27***	−.35***	.90
MDD–Time 2[d]	−.07	−.18*	.01	.07	.22*	−.11	.88
MDD–Time 3[e]	−.06	−.19*	−.08	−.06	.18*	−.27**	.93
GAD–Time 1[c]	−.03	−.45**	−.14	−.04	.36***	−.37***	.89
GAD–Time 2[d]	−.02	−.23**	−.03	.02	.21*	−.22**	.92
GAD–Time 3[e]	−.08	−.17	−.05	.02	.14	−.29***	.86

Note. PTSD = posttraumatic stress disorder; MDD = major depressive disorder; GAD = generalized anxiety disorder. $N = 133$ for all three time points. To insure that the overall chance of Type I error would be less than .05, a full Bonferroni correction was implied.
[a]Gender is a binary-coded variable (0 = *women*, 1 = *men*). [b]Immediate emotional response of helplessness and fearfulness (0 = *no*, 1 = *yes*). [c]Time 1 = during the war (January 7, 2009), $n = 135$. [d]Time 2 = 2 months after the ceasefire (March 10, 2009), $n = 134$. [e]Time 3 = 4 months after the ceasefire (May 10, 2009), $n = 133$.
* $p < .05$, two-tailed. ** $p < .01$, two-tailed. *** $p < .001$, two-tailed.

Table 3. Hierarchical Multiple Regressions for PTSD Symptoms

Predictors	R^2	ΔR^2	B	*SE B*	β	*F*-change	Overall *F*	*df*
Time 1[a]								
Step 1	.08					11.71***	11.71***	1,134
Gender[d]			−8.27	2.42	−.28***			
Step 2	.17	9%				14.95***	13.95***	2,133
Immediate emotional response[e]			8.96	2.32	.34***			
Step 3	.48	31%				77.27***	40.43***	3,132
Social support			−0.37	0.04	−.56***			
Step 4	.59	11%				35.27***	47.07***	4,131
Immediate Emotional Response × Social Support			0.12	0.02	.38***			
Time 2[b]								
Step 1	.06					8.82**	8.82**	1,133
Gender[d]			−6.03	2.03	−.25**			
Step 2	.12	6%				7.86**	8.57**	2,132
Immediate emotional response[e]			5.46	1.95	.26**			
Step 3	.16	4%				5.88***	7.89***	3,131
Social support			−0.11	0.04	−.20*			
Step 4	.27	12%				20.45***	11.92***	4,130
Immediate Emotional Response × Social Support			0.10	0.02	.38***			
Time 3[c]								
Step 1	.04					6.01*	6.01*	1,132
Gender[d]			−5.23	2.13	−.21*			
Step 2	.08	4%				4.67**	5.42**	2,131
Immediate emotional response[e]			4.47	2.07	.21*			
Step 3	.22	14%				22.46***	11.71***	3,130
Social support			−0.21	0.04	−.38***			
Step 4	.34	12%				23.41***	16.17***	4,129
Immediate Emotional Response × Social Support			0.11	0.02	.40***			

Note. PTSD = Posttraumatic Stress Disorder.
[a]Time 1 = during the war (January 7, 2009), $n = 135$. [b]Time 2 = 2 months after the ceasefire (March 10, 2009), $n = 134$. [c]Time 3 = 4 months after the ceasefire (May 10, 2009), $n = 133$. [d]Gender is a binary-coded variable (0 = *women*, 1 = *men*). [e]Immediate emotional response of helplessness and fearfulness (0 = *no*, 1 = *yes*).
*$p < .05$, two-tailed. **$p < .01$, two-tailed. ***$p < .001$, two-tailed.

associations were found between immediate emotional responses and number of rocket and missile attacks, either before ($r = .02$, *ns*) or during the war ($r = .08$, *ns*).

Multivariate Analyses

To examine the relations between perceived social support and immediate emotional response and their longitudinal effects on the mental health outcomes, we used a series of hierarchical multiple regression analyses with interactions (Aiken & West, 1991). The regressions were set up hierarchically, with gender covaried in Step 1, immediate emotional response entered in Step 2, social support entered in Step 3, and the interaction of immediate emotional response with social support entered in Step 4. The results of these regression analyses are presented in Tables 3, 4, and 5.

As shown in Tables 3, 4, and 5, in Step 2, immediate emotional response significantly predicted levels of PTSD and MDD at each time point and GAD at Time 1 and Time 2, but not at Time 3. Beyond the significant effects of immediate emotional response, in Step 3, low social support significantly predicted levels of PTSD and GAD at each of the time points and MDD at Time 1 and Time 3, but not at Time 2. In Step 4, significant interactions were observed between immediate emotional response and social support in the prediction of levels of PTSD, MDD, and GAD at each of the time points. As can be seen, these interactions add a

Table 4. Hierarchical Multiple Regressions for MDD Symptoms

Predictors	R^2	ΔR^2	*B*	*SE B*	β	*F*-change	Overall *F*	*df*
Time 1[a]								
Step 1	.11					15.6***	15.65***	1,134
Gender[d]			−4.90	1.24	−.32***			
Step 2	.13	2%				3.10***	9.49***	2,133
Immediate emotional response[e]			2.18	1.24	.18*			
Step 3	.22	9%				15.49***	12.18***	3,132
Social support			−0.11	0.03	−.31***			
Step 4	.28	6%				9.92***	12.24***	4,131
Immediate Emotional Response × Social Support			0.04	0.01	.27**			
Time 2[b]								
Step 1	.03					4.22*	4.22*	1,133
Gender[d]			−2.74	1.33	−.18*			
Step 2	.05	2%				3.15*	3.71*	2,132
Immediate emotional response[e]			2.30	1.30	.18*			
Step 3	.07	2%				0.61*	2.67*	3,131
Social support			−0.02	0.03	−.07 *ns*			
Step 4	.19	12%				20.62***	7.06**	4,130
Immediate Emotional Response × Social Support			0.07	0.02	.41***			
Time 3[c]								
Step 1	.04					4.94*	4.94*	1,132
Gender[d]			−2.36	1.06	−.19*			
Step 2	.06	2%				3.12*	3.06*	2,131
Immediate emotional response[e]			1.12	1.04	.19*			
Step 3	.10	4%				7.65**	4.68**	3,130
Social support			−0.07	0.02	−.24**			
Step 4	.22	12%				18.88***	8.72***	4,129
Immediate Emotional Response × Social Support			0.05	0.01	.39***			

Note. MDD = Major depressive disorder.
[a]Time 1 = during the war (January 7, 2009), $n = 135$. [b]Time 2 = 2 months after the ceasefire (March 10, 2009), $n = 134$. [c]Time 3 = 4 months after the ceasefire (May 10, 2009), $n = 133$. [d]Gender is a binary-coded variable (0 = *women*, 1 = *men*). [e]Immediate emotional response of helplessness and fearfulness (0 = *no*, 1 = *yes*).
$^{*}p < .05$, two-tailed. $^{**}p < .01$, two-tailed. $^{***}p < .001$, two-tailed.

substantial amount of explained variance for PTSD, MDD, and GAD at each time point.

The pattern of these interactions was probed using simple slopes tests as recommended by Aiken and West (1991). We found that the slope of the line representing the association between high social support and low PTSD was significant for those who reported an immediate emotional response ($\beta = -.67$, $p < .001$ for PTSD at Time 1; $\beta = -.22$, $p < .03$ for PTSD at Time 2; and $\beta = -.42$, $p < .001$ for PTSD at Time 3), but not for those who reported no emotional response ($\beta = -.16$, *ns*, for PTSD at Time 1; $\beta = -.19$, *ns*, for PTSD at Time 2; and $\beta = -.16$, *ns*, for PTSD at Time 3). Thus, a high level of social support significantly moderated the effect of immediate emotional response on levels of PTSD at each time point.

The slope of the line representing the association between a high level of social support and low MDD was significant for those who reported an immediate emotional response ($\beta = -.37$, $p < .001$ for MDD at Time 1; $\beta = -.20$, $p < .05$ for MDD at Time 2; and $\beta = -.24$, $p < .01$ for MDD at Time 3), but not for those who reported no immediate emotional response ($\beta = -.04$, *ns*, for MDD at Time 1; $\beta = -.08$, *ns*, for MDD at Time 2; and $\beta = -.29$, *ns*, for MDD at Time 3). Thus, a high level of social

Table 5. Hierarchical Multiple Regressions for GAD Symptoms

Predictors	R^2	ΔR^2	*B*	*SE B*	β	*F*-change	Overall *F*	*df*
Time 1[a]								
Step 1	.20					33.82***	33.82***	1,134
Gender[d]			−6.97	1.20	−.45***			
Step 2	.23	3%				5.35***	20.138***	2,133
Immediate emotional response[e]			2.75	1.19	.20*			
Step 3	.33	10%				17.90***	21.11***	3,132
Social support			−0.11	0.03	−.31***			
Step 4	.41	9%				19.49***	22.94***	4,131
Immediate Emotional Response × Social Support			0.06	0.01	.34***			
Time 2[b]								
Step 1	.05					7.43**	7.43**	1,133
Gender[d]			−3.0	1.10	−.23**			
Step 2	.07	2%				3.03**	4.70**	2,132
Immediate emotional response[e]			1.50	1.08	.19*			
Step 3	.10	3%				4.52**	4.72**	3,131
Social support			−0.05	0.02	−.18*			
Step 4	.20	10%				16.12***	7.99***	4,130
Immediate Emotional Response × Social Support			0.05	0.01	.36***			
Time 3[c]								
Step 1	.03					3.77*	3.77*	1,132
Gender[d]			−2.03	1.04	−.17 *ns*			
Step 2	.03	0%				.73 *ns*	2.45 *ns*	2,131
Immediate emotional response[e]			0.88	1.03	.08 *ns*			
Step 3	.10	7%				9.71**	4.84**	3,130
Social support			−0.07	0.02	−.27**			
Step 4	.18	8%				12.65***	7.12***	4,129
Immediate Emotional Response × Social Support			0.04	0.01	.32***			

Note. GAD = Generalized anxiety disorder.
[a]Time 1 = during the war (January 7, 2009), $n = 135$. [b]Time 2 = 2 months after the ceasefire (March 10, 2009), $n = 134$. [c] Time 3 = 4 months after the ceasefire (May 10, 2009), $n = 133$. [d]Gender is a binary-coded variable (0 = *women*, 1 = *men*). [e]Immediate emotional response of helplessness and fearfulness (0 = *no*, 1 = *yes*).
*$p < .05$, two-tailed. **$p < .01$, two-tailed. ***$p < .001$, two-tailed.

support also significantly moderated the effect of an immediate emotional response on levels of MDD at each time point.

Finally, the slope of the line representing the association between a high level of social support and a low level of GAD was significant among those who reported an immediate emotional response (β = −.39, $p < .001$ for GAD at Time 1; β = −.19, $p < .05$ for GAD at Time 2; and β = −.30, $p < .01$ for GAD at Time 3), but not for those reporting no immediate emotional response (β = −.07, *ns*, for GAD at Time 1; β = −.03, *ns*., for GAD at Time 2; and β = −.08, *ns*, for GAD at Time 3). Thus, a high level of social support significantly moderated the effect of intense exposure on levels of GAD at each time point.

To examine whether the significant Immediate Emotional Response × Social Support interactions preserved their roles in the prediction of longitudinal changes in PTSD, MDD, and GAD, we reran the regressions presented in Tables 3, 4, and 5 for predicting PTSD, MDD, and GAD at Time 2 while entering in Step 2 the outcome assessed at Time 1. Similarly, we reran regressions for the predictions of PTSD, MDD, and GAD at Time 3 while entering in Step 2 the outcome assessed at Time 1 and Time 2 (thus controlling for the previous level of symptoms in addition to initial symptom level). The other steps remained the same (i.e., in Step 1, gender; in Step 3, immediate emotional responses; in Step 4, social support; and in Step 5, the Immediate Emotional

Response × Social Support interaction). The results of these analyses indicated that the significant Immediate Emotional Responses × Social Support interactions remained significant in the prediction of changes in PTSD symptoms at Time 2 ($\beta = .18$, $p < .05$) and Time 3 ($\beta = .16$, $p < .05$), for the prediction of change in MDD symptoms at Time 2 ($\beta = .27$, $p < .001$) and Time 3 ($\beta = .19$, $p < .05$), and for the prediction of change in GAD symptoms at Time 2 ($\beta = .27$, $p < .01$) and Time 3 ($\beta = .19$, $p < .05$). Thus, in a rather strict model, the Immediate Emotional Responses × Social Support interaction not only predicted PTSD, MDD, and GAD symptoms at each assessment time point, but also predicted longitudinal change in outcomes while controlling for their previous levels.

DISCUSSION

This is the first study to examine longitudinally the mental health consequences of the Israel–Gaza 2009 war among Israeli civilians. Our data collected during the war, and 2 and 4 months after the war, in a selected sample of young adults, suggest a rapid and sharp decline in symptom levels of PTSD, MDD, and GAD. Symptoms of all disorders were more common among women than men and severity of trauma exposure before and during the war had no effect on immediate response or psychopathology. Perceived social support during the war moderated the effects of immediate emotional response on all psychopathology variables at each time point, as well as the changes in each of these variables over time.

The elevated prevalence PTSD, MDD, and GAD at Time 1 can be explained by the powerful threat to life that participants experienced during the war. It is noteworthy that many participants in this sample may have continued to be exposed to long-distance missiles (up to 40 km from the Gaza–Israel border) even after evacuation. Yet, the sharp decline in symptom levels across the three disorders between Time 1 and Time 2 suggests an impressive capacity to quickly recover from initial high symptom levels in response to external changes (i.e., ceasefire). This pattern is consistent with previous findings in civilians after the 9/11 terrorist attacks (Bonanno, Galea, Bucciarelli, & Vlahov, 2006; Galea et al., 2003) and in Israeli populations (Lomranz, Hobfoll, Johnson, Eyal, & Tzemach, 1994).

Interestingly, our trauma severity measures did not predict psychopathology at any time point. Although extensive research on war veterans (e.g., Neria et al., 2000) and communities exposed to disasters (e.g., Galea et al., 2003; Neria et al., 2006) has yielded divergent results, our findings are in accordance with findings from other studies conducted with Israeli populations (e.g., Bleich et al., 2003; Shalev et al., 2006). Small spatial distances and the ongoing threat of terrorism in Israel may blur the distinction between direct and indirect exposure, creating a national sense of threat. Moreover, it is possible that ongoing trauma exposure, especially exposure to high-impact life threats, may operate in two directions. For some people, exposure may serve to build resistance against mental health problems (e.g., Basoglu, Paker, Ozmen, Tasdemin, & Sahin, 1994) via "immunization" to trauma-induced fear, or increased self-efficacy or controllability in the face of direct challenge. Alternatively, chronic exposure to trauma may produce a strong sense of vulnerability, accompanied by PTSD, MDD, and GAD, that may be independent of the exact location of the participant or the number of traumatic events experienced (Besser & Neria, in press). Future longitudinal research is needed to explore these two possibilities.

Women were more likely to report immediate negative emotional responses to the attacks and higher symptom levels of PTSD, MDD, and GAD over time, suggesting that gender differences in trauma-related psychological responses are robust across different time points following trauma exposure, starting with early responses to trauma and resulting in long-term distress months after the initial exposure.

Extending previous knowledge, our data suggest that immediate emotional response to trauma predicts not only PTSD symptoms (Brewin et al., 2000; Neria et al., 2000), but also MDD and GAD symptoms over time. These findings may suggest that the response to high-impact trauma is often a process that begins immediately after exposure, through helplessness and fearfulness that may lead to long-lasting psychopathology not limited to PTSD.

Our findings concerning the predictive role of perceived social support in psychopathology over time are consistent with a growing body of research reporting that perception of available support is a potent moderator/buffer in the stress-distress relation, as has been demonstrated among disaster victims (e.g., Norris & Kaniasty, 1996) and, recently, among Israeli civilians (Besser & Priel, 2010). Importantly, our data indicate that high levels of social support not only predict lower levels of psychopathology over time, but also moderate the longitudinal effect of immediate emotional response on symptoms of PTSD, MDD, and GAD. These findings suggest that greater perceived social support may reduce levels of vulnerability among individuals who may be particularly vulnerable to long-lasting psychopathology due to their intense initial response following exposure to potentially traumatic events.

The present study has several limitations. First, the study utilized a selected sample of college students that does not necessarily represent the general population. Second, our sample was small and relatively homogeneous in terms of demographics and trauma exposure. Third, because the first wave of data collection was conducted less then 1 month from the beginning of the war, positive reports of PTSD in Time 1 may not be strictly qualified as PTSD, as PTSD diagnosis is based on symptoms that persist for at least 1 month. Despite these limitations, the present study extends previous knowledge with regard to the wide impact of war trauma beyond symptoms of PTSD and the potential role of social support in moderating the negative effect of immediate emotional response on a broad range of psychiatric symptomatology over time. Early psychosocial interventions to help highly symptomatic individuals build or maintain support networks may be useful for

alleviating the long-term psychological repercussions of exposure to war-related trauma.

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