

Exposure to Terrorism, Stress-Related Mental Health Symptoms, and Coping Behaviors Among a Nationally Representative Sample in Israel

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SINCE THE BEGINNING OF THE AL-Aqsa intifada in late September 2000, Israeli society has been confronted by continual terrorism, including knife or gun attacks, drive-by shootings, intrusions into homes, and suicide bombings. By April 30, 2002, 472 persons (318 civilians) had been killed in terrorist attacks and 3846 persons (2708 civilians) had been injured (totaling 0.067% of the population of 6.4 million). Five hundred sixty of the terrorist attacks (out of more than 13000), with a death toll of 185, had been carried out within Israel's 1967 borders.¹

With the exception of a number of telephone and Web-based surveys conducted following the September 11, 2001, attacks in the United States, few studies have examined the impact of modern forms of terrorism on nationally representative samples of developed countries. These post-September 11 studies examined such matters as persons' sense of safety^{2,3} and the prevalence of symptoms of posttraumatic stress disorder (PTSD), and traumatic stress-related (TSR) symptoms.^{4,5}

No study, however, has examined the psychological impact of the ongoing terrorism in Israel. Herein we report the results of a nationally representative telephone-based survey of Israeli resi-

Context The terrorist attacks on Israeli society have been ongoing since September 2000. However, few studies have examined the impact of terrorism on nationally representative population samples, and no study has examined the psychological impact of ongoing terrorism in Israel.

Objectives To determine the level of exposure to terrorist attacks and the prevalence of traumatic stress-related (TSR) symptoms, symptoms of posttraumatic stress disorder (PTSD), and sense of safety after 19 months of terrorism in Israel, and to identify correlates of the psychological sequelae and the modes of coping with the terrorism.

Design, Setting, and Participants Telephone survey conducted April-May 2002, using a strata sampling method, of 902 eligible households and a representative sample of 742 Israeli residents older than 18 years (82% contact rate) and a final participation of 512 (57%).

Main Outcome Measures Number of TSR symptoms, rates of those with symptom criteria for PTSD and acute stress disorder assessed by the Stanford Acute Stress Reaction Questionnaire, self-reported feelings of depression, optimism, sense of safety, help-seeking, and modes of coping.

Results Of 512 survey participants, 84 (16.4%) had been directly exposed to a terrorist attack and 191 (37.3%) had a family member or friend who had been exposed. Of 510 participants who responded to questions about TSR symptoms, 391 (76.7%) had at least 1 TSR symptom (mean, 4.0 [SD, 4.5]; range, 0-23; mean intensity, 0.8; range, 0-4). Symptom criteria for PTSD were met by 48 participants (9.4%) and criteria for acute stress disorder, by 1 participant; 299 (58.6%) reported feeling depressed. The majority of respondents expressed optimism about their personal future (421/512 [82.2%]) and the future of Israel (307/509 [66.8%]), and expressed self-efficacy with regard to their ability to function in a terrorist attack (322/431 [74.6%]). Most expressed a low sense of safety with respect to themselves (307/509 [60.4%]) and their relatives (345/507 [67.9%]). Few reported a need for professional help (27/506 [5.3%]). Female sex, sense of safety, and use of tranquilizers, alcohol, and cigarettes to cope were associated with TSR symptoms and symptom criteria for PTSD; level of exposure and objective risk were not. The most prevalent coping mechanisms were active information search about loved ones and social support.

Conclusions Considering the nature and length of the Israeli traumatic experience, the psychological impact may be considered moderate. Although the survey participants showed distress and lowered sense of safety, they did not develop high levels of psychiatric distress, which may be related to a habituation process and to coping mechanisms.

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dents conducted in April through May 2002, to determine the prevalence of symptoms of PTSD and to identify correlates of these psychological sequelae and the coping modes used to deal with exposure to terrorism and its ongoing threat.

METHODS

Sampling

Because Israel is a heterogeneous country with many subpopulations, the sample was obtained by a within-strata random-sampling method using a large database maintained by the DAHAF Institute. This database contains basic demographic data on owners of telephones that has been gathered and updated for more than 40 years for polling purposes. This method uses pools of stratified household telephone numbers. These numbers are randomly chosen by computer until the size criteria of each strata is attained. Strata were identified by the following criteria: age, residence (towns and communities), new immigrants from the former Soviet Union, kibbutz members, ultraorthodox Jews, Israeli Arabs, and Jews either born or whose fathers were born in western Europe or North America vs those born or whose fathers were born in Asia or Africa (new immigrants included). The size of each stratum was deduced from information drawn from the Israel Central Bureau of Statistics.⁶ The target population consisted of all adult Israeli residents aged 18 years or older. Accordingly, 902 households were telephoned and 742 individuals (each representing 1 household) were randomly reached by telephone (82% contact rate). Of these, 512 (69%) agreed to participate in the study, yielding a final participation rate of 57% and a representative sample of the Israeli population with a maximum sampling error of 4.5%.

Demographic characteristics of participants are shown in TABLE 1. The sample consisted of 250 men (48.9%) and 262 women (51.1%). Ages ranged from 18 to 66 (mean, 38.35; SD, 15.8) years. There were 444 Jews (86.8%) and 68 Arabs (13.2%). In terms of educa-

tion, 243 (48.4%) had a year or more of education after high school, 236 (46.9%) had completed high school, and 24 (4.7%) had attended only elementary school. With respect to religiosity, 48 of the 444 Jews in the sample (11%) reported that they were religious (ie, attempted to follow most of the religious rules, such as wearing a "cap" within secular society), 134 (30.5%) that they were traditional (ie, followed most of the religious rules of their respective ethnic tradition, usually only within the confines of their homes and places of prayer), 21 (4.9%) that they were orthodox (ie, lived in a religious community and followed the religious rules socially as well as personally), and 235 (53.6%) that they were atheist. Most of the sample lived in urban areas. Of the 444 Jews in the sample, 56.7% were born in Israel and 43.3% were immigrants. All Arab participants were born in Israel. With respect to income, 179 (49.3%) reported a net family income below the mean (about \$2000 per month), 145 (31.7%) reported a mean family income, and 132 (28.9%) reported a family income higher than the mean. The sample was representative of the Israeli population: no differences were observed between the above distribution and data provided by the Israel Central Bureau of Statistics, 2001.⁶

Analysis of Nonparticipants

Participants (n=512) and nonparticipants (n=230) did not differ on sex, income, residence, new immigrants from the former Soviet Union, kibbutz members, ultraorthodox Jews, Israeli Arabs, and Jews being first- or second-generation immigrants from western Europe or North America vs those from Asia or Africa. Nonparticipants were significantly younger (mean age, 35.7 [SD, 15.4] years) than participants (mean age, 38.2 [SD, 14.2] years; $t_{740}=2.1$; $P=.04$).

Data Collection

Interviews were carried out by telephone using a structured questionnaire. Three attempts were made to contact an adult at each telephone number. Whenever 5 questions were not re-

Table 1. Characteristics of Survey Participants (N = 512)

Characteristic	No. (%)
Age of participants, mean (SD) [range], years	38.4 (15.8) [18-66]
Sex	
Men	250 (48.9)
Women	262 (51.1)
Ethnicity	
Jews	444 (86.8)
Israeli Arabs	68 (13.2)
Education (n = 503)	
Elementary school only	24 (4.7)
High school	236 (46.9)
≥1 Year after high school	243 (48.4)
Religiosity (Jews; n = 444)*	
Religious	48 (11.0)
Traditional	134 (30.5)
Orthodox	21 (4.9)
Atheist	235 (53.6)
Residence	
Urban areas	406 (79.4)
Israeli Arab villages	68 (13.2)
Agricultural or village communities	38 (7.4)
Kibbutzim	10 (2.0)
Settlements outside the 1967 Israeli borders	9 (1.8)
Place of birth (Jews; n = 444)†	
Israel	251 (56.7)
Outside of Israel	193 (43.3)
Income	
Below mean	179 (49.3)
Mean (US \$2000/mo)	145 (31.7)
Above mean	132 (28.9)

*Religiosity data were not obtained for Arab participants.
†All Arab participants were born in Israel.

sponded to, the individual was considered a nonparticipant and the interview was stopped (n=5). Interviews were carried out on April 30 and May 1, 2002, by which time Israeli residents had experienced 19 months of terrorism.

Oral informed consent was obtained at the beginning of the interview, when participants were asked whether they agreed to participate in the study. The Helsinki Ethics Committee of the Lev-Hasharon Mental Health Center, affiliated with the Sackler School of Medicine of the Tel-Aviv University, approved the study.

The interviewers were telephone-survey professionals with at least 1 year of experience who received training by a psychologist (M.G.) and a graduate psychologist with experience in conducting telephone surveys. Trained interviewers conducted telephone inter-

views in Hebrew, Russian, or Arabic; interviewers speaking other languages were available but not used. A pilot study (see “Instruments” section) was carried out in which a pool of interviewers best suited for this survey was chosen based on their interview performance in the pilot study.

Instruments

The research instrument was a structured questionnaire consisting of 51 questions drawn from several questionnaires used in the study of reactions to trauma and coping.⁷⁻⁹ These questionnaires measure TSR symptoms, means of coping, sense of safety, and orientation to the future. In addition, we added questions used in previous surveys to assess reactions to major stressful events³ as well as questions developed specifically for this study.

Except as otherwise indicated below, the participants were asked to reply to the questions with respect to the “last year and a half since the beginning of the events,” which is approximately the time that had elapsed since the beginning of the intifada. All items were self-referential. Following a pilot study of 50 individuals, the questionnaire was modified to make it telephone-friendly, remove items that were difficult to understand, and combine some questions to reduce their number. Eighty-eight percent of the questionnaires were answered in 12 to 15 minutes.

For the purpose of this study a “terrorist attack” was operationally defined as any armed attack by a self-proclaimed terrorist group, as categorized by the Israel Defense Forces.¹⁰

Exposure was assessed by participants being asked whether they had been exposed to a terrorist attack, whether they had a friend or family member who had been exposed to an attack, and whether they or their friend or family member were injured or died in the attack. Based on these 3 questions, we divided the participants into 6 exposure score groups: (1) no exposure; (2) friend/family-only exposure, uninjured; (3) friend/family-only ex-

posure (not personal), injured or killed; (4) personal exposure only; (5) personal and friend/family exposure, without injuries; and (6) personal and friend/family exposure, with injuries and/or death of a relative or friend.

Trauma- and stress-related mental health symptoms were measured using a modified version of the Stanford Acute Stress Reaction Questionnaire (SASRQ).⁷ The SASRQ has acceptable statistical properties⁷ and has been used in trauma-related surveys² to assess TSR symptoms and symptoms of acute stress disorder (ASD) and PTSD. Our modified SASRQ had a Cronbach α score of 0.91. The questionnaire consists of 5 groups of questions representing the 5 PTSD clusters as defined by *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* criteria. It was composed of 23 statements, each referring to a particular stress-related symptom or behavior. For this study, we used 4 persistent reexperiencing items (cluster B), 6 avoidance/numbing items (cluster C), 6 hyperarousal items (cluster D), 4 dissociative items (ie, depersonalization, derealization, emotional numbing, amnesia), 2 impairment-cluster items (1 work-related and 1 social-related), and 1 distress item. Participants were asked to rate their agreement with each stress symptom on a 5-point Likert scale (0=disagree, 1=agree somewhat, 2=agree, 3=strongly agree, 4=agree completely), and to report how long they had felt or behaved in the stated manner (1=2 days or less; 2=less than 1 month; 3=1 month or more).

A symptom was considered relevant for TSR and PTSD if the individual at least “agreed” (third choice out of 5) with the item and declared having had the symptom for at least 1 month. This standard was used for the analyses of the number of TSR symptoms and symptom criteria for PTSD and ASD. Because not all participants met the full *DSM-IV* criteria for PTSD (eg, actual exposure vs indirect exposure to a traumatic event) and because our observations were made on the basis of screening instruments and not comprehensive clinical evaluations, the par-

ticipants were not considered to have a clinical diagnosis of PTSD or ASD but an aggregation of symptom criteria for PTSD and ASD.⁵

The survey included a single question regarding depression. Participants were asked whether they felt “depressed” or “gloomy.”

Coping was assessed using a modified version of the COPE⁸ questionnaire. This questionnaire has acceptable statistical properties for the assessment of coping mechanisms and has been used in other trauma-related studies.^{2,8} A telephone pilot study using a student sample showed good test-retest properties over 2 weeks (Pearson $r = 0.83-0.98$; $n = 30$). The questionnaire consisted of 14 questions. Ten questions were originally taken from the COPE questionnaire and referred to distinct different means of coping: emotional social support/venting of emotions, instrumental social support, faith in God, acceptance, mental disengagement, denial, use of alcohol or cigarettes (to cope with the situation), use of tranquilizers (to cope with the situation), humor, and engaging in activities. Questions were added to discern whether the participants had checked on the safety of relatives and/or friends when there had been an attack, whether they listened to the television and radio to receive information (active coping), whether they avoided television and radio news broadcasts (avoidance coping), and whether they sought help from friends or family (actively seeking help/social support). Participants were asked to indicate how often they used each means of coping on a 5-point scale, ranging from 0 (not at all) to 4 (a great deal). They also were asked whether they found each means of coping they endorsed helpful (helpful or not).

Coping modes were presented in terms of type, the amount of coping mechanisms used, and the frequency of usage in each case (0=not used, 1=used a little, 2=used sometimes, 3=used often, 4=used always).

Future orientation was queried via 2 items modified from the Children’s Fu-

ture Orientation Scale⁹; these 2 items assess optimism about personal future and the future of Israel. Based on a telephone interview of a student sample, test-retest correlation for these 2 items was $r=0.90$ and $r=0.92$, respectively ($n=30$). Participants were asked to indicate the degree to which they agreed with the statements on a 6-point Likert scale ranging from 1 (very much agree) to 6 (do not agree at all). A response was considered positive if the participant indicated at least moderate agreement.³

Sense of safety was assessed by 2 items created for the study, which respectively queried respondents' sense of threat to themselves and their relatives. Based on a telephone interview of a student sample, test-retest correlation for these 2 items was $r=0.93$ and $r=0.90$, respectively ($n=30$). These 2 questions were rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (very much). These questions were combined for the regression analysis. A response was considered positive if the participant indicated at least moderate agreement.²

Self-efficacy was assessed by a single item asking participants to indicate how much they believed that they would know what best to do if they were caught in a terrorist attack. Based on a telephone interview of a student sample, test-retest correlation for this item was $r=0.90$ ($n=30$). This question was rated on a 5-point Likert scale ranging from 0 (not at all) to 4 (very much). A response was considered positive if the participant indicated at least moderate agreement.²

Help-seeking behavior was examined by asking participants whether they currently felt a need for psychological or psychiatric treatment and whether they had called the telephone hotlines put in place to help people cope with the distress caused by terrorism. If participants answered "yes" to the latter question, they were asked whether the contact had been helpful and whether they thought that they would use the hotlines in the future.

Three measures were used to assess objective threat. First, all individuals

Table 2. Rate of Exposure to Terrorism (N = 512)

Exposure	No. (%)
No personal exposure and no exposure of friends and relatives	285 (55.6)
No personal exposure but exposure of friends and relatives, not wounded	61 (12.0)
No personal exposure but exposure of friends and relatives who were wounded and/or died	82 (16.0)
Personal exposure and no exposure of friends and relatives	36 (7.0)
Personal exposure and exposure of friends and relatives who were exposed but not wounded	17 (3.3)
Personal exposure and exposure of friends and relatives who were wounded and/or died	31 (6.0)

who lived in either Jerusalem, Tel-Aviv, Netania, or Haifa (4 cities where most of the suicide bombings occurred before the study was performed), as well as those who lived in the disputed settlements, were grouped together and compared with those who lived elsewhere. A comparison of those 2 groups showed that individuals residing in higher-risk areas reported significantly higher exposure scores than those residing in lower-risk areas (lower-risk areas [$n=379$]: 0.90 [SD, 1.4]; higher-risk areas [$n=133$]: 1.50 [SD, 1.6]; $t_{510}=-3.8$; $P=.001$). Second, individuals living in urban vs nonurban places were compared after removing from this variable those living in the disputed settlements. A comparison of these 2 groups showed the urban group to have been significantly more exposed to terrorist attacks than the nonurban group (urban group [$n=404$]: 1.15 [SD, 1.5]; nonurban group [$n=98$]: 0.72 [SD, 1.4]; $t_{510}=5.0$; $P=.008$). Third, the Jewish and Arab populations were compared. A comparison of these 2 groups showed Jews to have been significantly more exposed than Arabs (Jews [$n=442$]: 1.20 [SD, 1.5]; Arabs [$n=67$]: 0.57 [SD, 1.4]; $t_{507}=7.9$; $P=.001$).

Statistical Analyses

Age, years of education, immigration year, and income were analyzed as continuous data, and sex, ethnic background, religiosity, residence (town, community, settlement, kibbutz, urban/nonurban), and place of birth (Israel/elsewhere) as categorical data. Data were weighted to control for age and sex in the descriptive analyses. *t* Tests for independent samples, χ^2 tests, and Pear-

son correlations were performed, followed by 2 forward stepwise linear regression for the continuous variables of TSR symptoms and "feeling depressed," and a forward conditional logistic regression for the variable of dichotomic symptoms of PTSD. In each regression analysis the significant predictors from 7 groups of variables (demographics, exposure, objective risk, coping, self-efficacy, future orientation, and sense of safety) were tested for inclusion in the final models. Significance was set at $P\leq .05$ (2-tailed). Non-significant variables were removed from analysis to provide for the most parsimonious model. No imputation of missing values was performed apart from the income score, which was replaced by the sample mean for regression analyses. To control for the possibility that replacing mean income scores for missing values biased our sample, regression analyses were also performed on a smaller sample ($n=422$) after removing all individuals with missing income values. Results did not differ significantly from the presented results of the original sample. Other cases were excluded from specific analysis when information was missing relative to the content analyzed. This did not affect the size and the integrity of the sample. SPSS-PC version 11.0 (SPSS Inc, Chicago, Ill) was used for all analyses.

RESULTS

The severity of exposure to terrorist attacks is shown in TABLE 2. More than half of respondents (285 [55.6%]) had not been personally exposed or had a family member or friend who was exposed to an attack. Thirty-six (7%) were

Table 3. Frequency of PTSD and ASD Symptoms (n = 510)

Symptoms	Symptoms Endorsed, Mean (SD) [Range]	Respondents With ≥ 1 Symptom, No. (%)
Reexperiencing (B) cluster	0.6 (0.9) [0-4]	189 (37.1)
Avoidance/numbing (C) cluster	1.1 (1.4) [0-6]	283 (55.5)
Hyperarousal (D) cluster	1.1 (1.5) [0-6]	252 (49.4)
Impairment	0.3 (0.5) [0-2]	116 (22.7)
General distress	0.5 (0.5) [0-1]	236 (46.3)
Dissociative cluster	0.4 (0.8) [0-4]	138 (26.9)
Total TSR symptoms	4.0 (4.5) [0-23]	391 (76.7)

Abbreviations: ASD, acute stress disorder; PTSD, posttraumatic stress disorder; TSR, traumatic stress-related.

exposed to an attack but had no family or friend who was exposed; 17 (3.3%) were personally exposed and had a friend or family member who was exposed without injury; and 31 (6%) were both personally exposed to a terrorist attack and had a friend or family member killed or wounded in an attack.

In total, 84 (16.4%) Israeli adults surveyed reported that they had been personally involved in a terrorist attack in the year and a half prior to the study; 113 (22.1%) reported that a friend or family member was wounded or killed in an attack; and 78 (15.3%) reported that they knew someone who survived an attack uninjured.

TSR Symptoms

Participants endorsed a mean of 4.0 (SD, 4.5) stress-related items out of the 23 that were queried (TABLE 3). The mean level of TSR symptom intensity was 0.8 (range, 0-4; SD, 0.7), and of 510 participants for whom TSR symptom intensity could be reported, 391 (76.7%) had at least 1 TSR symptom.

Symptoms of PTSD and ASD

As shown in Table 2, 189 (37.1%) of the participants endorsed at least 1 re-experiencing item (cluster B); 283 (55.5%) endorsed at least 1 avoidance/numbing symptom (cluster C); 252 (49.4%) of the participants endorsed at least 1 hyperarousal symptom (cluster D); 116 (22.7%) of the participants endorsed at least 1 of the 2 impairment items; and 236 (46.3%) endorsed the general distress item.

More than a quarter (138 [26.9%]) of the participants reported having at least 1 of the 4 dissociative symptoms;

the mean number of dissociative symptoms endorsed was 0.4 (SD, 0.8). Depersonalization was reported by 58 (11.4%) of the participants, derealization by 42 (8.2%), emotional numbing by 61 (12%), and amnesia by 46 (9%).

Symptom criteria for PTSD were met by 48 of the participants (9.4%). More stringent standards (taking into consideration only answers of "strongly agree" or higher) lowered the number to 14 (2.7%). Only 1 participant met symptom criteria for ASD.

Attitudes and Behaviors

Of the 510 participants responding to the depression question, 299 (58.6%) declared that they at least agreed with the statement "I feel depressed or gloomy"; 152 (29.8%) stated that they "agreed very much" or "totally agreed" with the statement.

The majority of participants (82.2% [421/512]) stated that they felt optimistic about their personal future and 66.2% (337/509) that they felt optimistic about the future of Israel. At the same time, 60.4% (307/509) declared that they felt that their lives were in danger and 67.9% (345/507) that they felt the lives of their family and/or acquaintances were in danger; 74.6% (322/431) at least agreed they would function efficiently in the event that they were caught in a terrorist attack.

Only 5.3% (27/506) of the participants stated that they felt a need for professional treatment; 12.2% (62/509) reported that they had called telephone hotlines during the period queried; and 13.9% (66/475) thought they might use them in the future. Of those who actu-

ally called the hotlines, 86.4% (57/66) had not used them in the past and only 12.9% (8/62) found them helpful.

Symptoms Associated With Exposure to Terrorism and Objective Threat

Using independent-samples *t* tests, χ^2 tests, and Pearson correlations, no significant associations were found between objective threat (high vs low residency risk, urban vs nonurban, and Jewish vs Arab population) or exposure levels, and number of TSR or PTSD symptoms or feeling depressed. With a sample size of 48 participants meeting symptom criteria for PTSD compared with 461 without PTSD, the analysis had a power of 44.8% to yield a statistically significant result.

Similarly, no significant association was found between objective threat (high vs low residency risk, urban vs nonurban, Jewish vs Arab Israeli), exposure and future orientation, or sense of personal safety. Nor was a significant association found between objective threat, level of exposure, and either perceived need for treatment, being in treatment, use of hotline, or anticipated use of hotline in the future. We found no significant association between objective threat and any of the dependent variables. The only significant association found with level of exposure was reduced sense of safety for friends or family (n = 505; Pearson $r = .13$; $P = .005$).

Demographic Variables Associated With Symptoms

The presence of a symptoms of PTSD was associated significantly with being female (16.2% [42/260] women vs 2.4% [6/249] men with symptoms of PTSD; $\chi^2_1 = 28.1$; $P < .001$) and with lower income (on a 1-5 scale, those with symptoms of PTSD [2.4; SD, 1.2] vs those with no symptoms of PTSD [2.8; SD, 1.2] $t_{454} = 2.01$; $P = .045$). No other demographic feature was found to be significantly associated with symptoms of PTSD.

A higher number of TSR symptoms was found in women (women: 5.2 [SD,

5.0]; men: 3.5 [SD, 3.5]; $t_{510}=6.2$; $P<.001$). Number of TSR symptoms also was associated with place of birth (inside of Israel: 3.7 [SD, 4.4]; outside of Israel: 4.6 [SD, 4.5]; $t_{510}=-2.2$; $P=.03$), religiosity (religious: 4.7 [SD, 5.1]; not religious: 3.6 [SD, 4.0]; $t_{437}=-2.6$; $P=.01$), and lower income (lower than average income: 4.67 [SD, 5.2]; average and higher income: 3.7 [SD, 4.2]; $t_{454}=-2.1$; $P=.03$). No other significant association was found with demographic items. Feeling depressed was associated with mean age (those feeling depressed: 41.2 [SD, 15.8]; those not feeling depressed: 37.2 [SD, 15.6] years; $t_{506}=2.6$; $P=.009$) and sex (women: 2.1 [SD, 1.2]; men: 1.4 [SD, 1.2]; $t_{506}=6.8$; $P<.001$).

Modes of Coping With Terrorist Attacks

The frequency and helpfulness of coping modes used to deal with the terrorist attacks are presented in TABLE 4. The most frequently used modes of coping were checking on whereabouts of family and friends after an attack and instrumental and emotional social support. Tranquilizers and alcohol or cigarettes were used less frequently as a specific coping mechanism. We did not assess use of tranquilizers, alcohol, and cigarettes that was not associated with coping. Self-distraction through activity, active search for social support, faith in God, and checking on the whereabouts of family or friends after attacks were considered the most helpful modes for those who had ever used them.

Participants used a mean of 6.4 (SD, 1.9; range, 1-12) coping modes “ever” and a mean of 1.3 (SD, 1.6; range, 0-8) coping modes “always.”

Regression Analyses

Three regression analyses were performed to assess the relative contribution of exposure to terrorist attack, demographic items, means of coping, future orientation, sense of safety, and self-efficacy to symptoms of PTSD, number of TSR symptoms, and feeling depressed. The final regression models are presented in TABLE 5.

All the regression models showed associations between all 3 dependent variables and female sex, low sense of safety (used here as a predictor variable), cop-

ing via use of tranquilizers, and coping via use of alcohol or cigarettes. In addition, the models showed that coping by avoiding television and radio was

Table 4. Modes of Coping With Terrorist Attacks

Coping Mode	No.	No. (%)		
		Individuals Who “Ever” Used the Coping Mode	Individuals Who “Always” Used the Coping Mode	Individuals Declaring the Coping Mode Had “Ever” Been Helpful
Check on whereabouts of family/friends after attacks	506	420 (83.0)	164 (32.4)	341/420 (81.2)
Instrumental social support, ie, talking to others about what can be done	510	414 (81.2)	58 (11.4)	169/414 (40.8)
Emotional social support, ie, talking to others about feelings	510	387 (75.9)	40 (7.8)	211/387 (54.5)
Accepting and coming to terms with the situation	509	381 (74.9)	72 (14.2)	237/381 (62.2)
Active search in the media for information concerning the attacks	501	323 (64.5)	64 (12.8)	168/323 (52.0)
Faith in God	510	305 (59.8)	142 (27.8)	255/305 (83.6)
Humor	508	258 (50.8)	33 (6.5)	212/258 (82.2)
Denial, ie, trying to ignore the situation and go on living despite the terror	507	236 (46.6)	35 (6.9)	149/236 (63.1)
Self-distraction through activity	508	191 (37.6)	27 (5.3)	162/191 (84.8)
Avoidance of television and radio broadcasts	507	163 (32.2)	22 (4.3)	98/163 (60.1)
Active search for social support	508	99 (19.5)	11 (2.2)	83/99 (83.8)
Use of tranquilizers	509	36 (7.1)	3 (0.6)	31/36 (86.1)
Use of alcohol or cigarettes	509	27 (5.3)	4 (0.7)	16/27 (59.3)

Table 5. Summary of Hierarchical Regression Analysis (TSR Symptoms and “Feelings of Depression”) and Logistic Regression Analysis (PTSD Symptoms)*

Variable	Standard β (SE)		PTSD Symptoms, OR (95% CI)
	TRS Symptoms	“Feeling Depressed”	
Female sex	-0.12 (0.36)	-0.21 (0.11)	5.54 (2.1-14.5)
Low sense of safety	0.31 (0.16)	0.20 (0.05)	2.10 (1.5-3.0)
Use of tranquilizers	0.30 (0.36)	0.16 (0.11)	1.78 (1.2-2.7)
Use of alcohol and cigarettes	0.16 (0.31)	NA	1.85 (1.2-2.8)
Avoidance of television/radio	0.12 (0.15)	0.10 (0.05)	NA
Faith in God	0.10 (0.10)	0.13 (0.03)	NA
Age	NA	0.12 (0.01)	NA

Abbreviations: CI, confidence interval; NA, not applicable; OR, odds ratio; PTSD, posttraumatic stress disorder; TSR, traumatic stress-related (symptoms).
 *Total R^2 for variables predicting TRS symptoms = 37.9; for variables predicting “feeling depressed” = 23.2. $P<.05$ for all variables. All coping modes were coded as “ever used.”

associated with the number of TSR symptoms, that faith in God was associated with the number of TSR symptoms and feeling depressed, and that older age was associated with feeling depressed. Due to sample size considerations we could not validate the logistic regression model for symptoms of PTSD (we could not assess fit via external validation).

COMMENT

This survey provides qualitative confirmation of the extensive exposure to terrorism that Israeli civilians have experienced during the violent intifada that began in September 2000. In the 19 months between then and the time that the survey was conducted, in April through May 2001, almost half the participants in the sample were exposed to terrorism personally or through a friend or family member: 16.4% of participants reported experiencing a terrorist attack personally, and 37.4% reported that a friend or relative was caught in an attack.

The findings suggest that the terrorism has had a substantial impact. Almost two thirds of the sample (60%) reported that they felt that their lives were in danger and more than two thirds (67.9%) that they felt that the lives of their friends and family were in danger.

In addition, the participants reported trauma- and stress-related mental health symptoms. More than one third (37.4%) of participants reported having at least 1 TSR symptom for at least 1 month, with a mean of 4 symptoms reported per person. The most frequently reported symptoms were avoidance/numbing, endorsed by 55.5% of the participants, followed by hyperarousal symptoms (49.4%), and reexperiencing trauma-related scenes (37.1%). Furthermore, 26.9% of the participants endorsed at least 1 dissociative symptom, 46.3% reported being distressed by the symptoms, and 22.7% reported that their work or social functioning was impaired.

More than half of the participants (58.6%) reported feeling depressed or gloomy and 28% that they felt "very" de-

pressed or gloomy. A total of 9.4% of participants met *DSM-IV* symptom criteria for PTSD. Although any clinical implications of these results should be interpreted with caution, the rate can be extrapolated to 610000 of 6.4 million Israelis who may have met symptom criteria for PTSD at the time of the study.

For all the distress, however, the emotional impact seems to have been fairly moderate. At the time of the study, the participants had faced 19 months of terrorist attacks marked by steadily increasing frequency. The terrorism reached almost all parts of the country. In addition, news of the terrorist attacks was repeatedly covered by television and radio. Considering the high levels of direct and indirect exposure to trauma in the sample, much more distress might have been expected than was actually found.

The mean number and intensity of TSR symptoms reported by this sample are similar to the number and intensity found among a national sample of US residents following the September 11 terrorist attack on the New York World Trade Center,² which, for all its devastation, occurred on a single day and further from home for most US residents than the recurrent attacks experienced by the Israeli population. The prevalence of those with symptom criteria for PTSD in our sample (9.4%) was also similar to that found after September 11 among New York residents (eg, the rate of 7.5% as reported by Galea et al⁴ and of 11.2% as reported by Schlinger et al⁵). However, the rate in Israel from this study is lower than the rates reported for persons in the immediate vicinity of the World Trade Center 1 to 2 months after the September 11 attack (20%),⁴ and for those outside of New York City 2 months after the attack (17%).² Indeed, the rate of those with symptom criteria for PTSD in Israel seems especially low in light of the fact that many Israelis have experienced previous traumatic events (eg, wars, prior terrorist attacks, the Holocaust), which may increase the pathogenicity of subsequent traumatic experiences.¹¹⁻¹³

Thus, despite high levels of distress and concerns about safety, a relatively low rate of symptoms of PTSD was observed. In addition, a majority of participants reported little demand for professional help in dealing with the symptoms aroused by the attacks. A majority also expressed optimism about their personal future and the future of Israel, and a sense of self-efficacy in the event of a terrorist attack.

Moreover, the majority of the participants seem to have coped constructively and flexibly with the terrorism. They used a mean of 6 modes of coping, the most prevalent of which were seeking information (about loved ones or in the news media) and getting (and apparently giving) emotional and instrumental social support and seeking it where they did not have it. In addition, the coping modes reported as always used were mostly instrumental ones, such as checking on the whereabouts of family or friends, active gathering of information from the news media, and social support. Such modes of coping have been reported to be associated with emotional health.^{12,14,15} A substantially smaller proportion of the participants reported using self-distraction or information avoidance, and a smaller percentage reported using tranquilizers, alcohol, or cigarettes as specific modes of coping. These results may help dispel the belief that people exposed to terrorism behave irrationally and that both ego control and the social fabric disintegrate. Our results might be slightly optimistic compared with other studies of the impact of trauma on large-scale populations. However, many previous relevant studies have been done in very extreme situations, such as war and civil conflict, which was not the case in Israel.¹⁶⁻¹⁸

The adaptive responses seen in this study may be explained by an accommodation effect, in which the stress and distress created by traumatic events decrease as they recur. Accommodation effects were reported during the 1991 Gulf War as Israelis became habituated to the repeated missile attacks to which they were subjected,^{11,12} as well

as during the German blitz during World War II when Londoners endured long and constant bombing.¹⁹ In fact, the behaviors of the Israeli and British populations seem to have been similar: neither had a substantial number of psychiatric casualties, and both became habituated to the stress. Along with feelings of depression, low sense of safety, and other TSR symptoms, both populations reported high levels of self-efficacy and optimism.

In addition to examining the emotional and cognitive repercussions of the ongoing terrorism, this study sought to identify predictors of distress. In contrast to the many studies that have found level of exposure to be associated with symptoms of PTSD, TSR symptoms, and other psychosocial responses to traumatic events,^{12,20} we found no association between symptom criteria for PTSD and level of exposure. Nor was any association found between level of exposure and the number or intensity of TSR symptoms or any of the other indicators of distress. That is, persons who were actually injured in a terrorist attack showed no more adverse emotional effects than those who had not been exposed to an attack, either themselves or through a family member or friend.

This finding may be accounted for in either of 2 ways. One is that those who experience terrorism may understate their distress and continue with their lives without being affected by it.^{12,21} The other is that it reflects the wide-ranging impact of the pervasive traumatic reality in Israel, which has either directly or indirectly (eg, through the news media) affected virtually the entire population. This interpretation is consistent with the conclusion of Silver et al² that the psychological impact of a major national trauma is not limited to those who experience it directly.

Further support for the second interpretation is provided by the demographic findings in our sample. These showed no difference in the traumatic sequelae experienced by the urban and nonurban populations or by the Jewish and Arab populations. Similarly,

education did not buffer the impact of the terrorism as it has been found to do for the impact of other traumatic experiences.¹²

Of all the demographic features studied, only female sex was significantly associated with all mental health outcomes assessed (ie, symptoms of PTSD, TSR symptoms, and "feeling depressed"). The regression analysis showed Israeli women to be 5.54 times more likely than men to have symptom criteria for PTSD, and a similar pattern also could be observed with TSR symptoms and feelings of depression. Our findings support previous reports of women being more likely than men to report having symptoms of PTSD.^{12,20,22} However, sex bias in the reporting of symptoms cannot be ruled out.¹² Further study is warranted on the relationship between trauma, emotional coping, and sex, and on the influence of this relationship on PTSD and TSR symptoms.

Limitations

The study has a number of limitations, including the absence of data from before the beginning of the intifada on the psychological repercussions that were examined in this study. Without knowing the rate of symptoms of PTSD in the population, the number and intensity of TSR symptoms, the sense of safety, and feelings of depression in the period preceding the intifada, we cannot properly ascertain the emotional impact of the terrorism. Another limitation is that about a third of those contacted refused to be interviewed. We cannot know whether or not their refusal was associated with a higher level of distress. Furthermore, we cannot determine whether these self-reported symptoms have clinical significance or if they simply reflect a heightened awareness and arousal due to the terrorist threat.

In addition, one should be cautious in generalizing the findings to various subpopulations that may or may not have been exposed to the threat of terrorism and may not have been properly represented by strata sampling (eg,

those without homes or telephones). Furthermore, our results are not generalizable to those younger than 18 years, who may in fact be at greater risk of developing probable PTSD and stress-related symptoms.²³ A final limitation lies in the fact that we have not studied actual behavior. The use of coping behaviors such as the avoidance of public places and public transport might have given more insight into how Israelis reacted to the threat of terrorism.

Conclusion

Nonetheless, our study does show that after 19 months of unremitting exposure to public terrorism, Israeli society was coping. Despite the limited sense of safety and substantial distress, most Israelis reported adapting to the situation without substantial mental health symptoms and impairment, and most sought various ways of coping with terrorism and its ongoing threats. This may be related to processes of adaptation and accommodation.

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Drafting of the manuscript: Gelkopf.

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Faithfulness to the truth of history involves far more than a research, into special facts. . . . The narrator must . . . himself be, as it were, a *sharer* or a spectator of the action he describes.

—Francis Parkman (1823-1893)