Emotional Impact of Exposure to Terrorism Among Young-Old and Old-Old Israeli Citizens

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Objective: *Since September 2000, continuous terrorist attacks have exposed Israeli society to trauma, and the impact of these events on the mental health of the elderly Israeli population remains unclear. The authors sought to assess the prevalence of posttraumatic stress-related symptoms of distress, depression, optimism, self-efficacy, and sense of safety of the young-old and old-old Jewish population after 19 months of intense terrorism in Israel, in order to identify correlates of the psychological sequelae and compare symptoms and coping methods of these populations with those of younger adults.* **Methods:** *Authors did a telephone survey using stratified sampling with a national sample of young-old (65–74 years old), old-old (>74 years old) and a comparison group of younger adults (18–64 years old).* **Results:** *No difference was found in the level of exposure, traumatic stress symptoms, including probable PTSD, except for a nonsignificant tendency toward more depersonalization and emotional numbness in the elderly group, a tendency toward more sleeplessness, more re-experiencing of unwanted thoughts, hyperarousal, fewer avoidance symptoms, and less disengagement-coping in the old-old group. Younger adults were found to be significantly more optimistic. Young-old and old-old people used cigarettes/alcohol and tranquilizers more often to cope with the situation, and old-old people who used disengagement-coping felt less helped by it.* **Conclusions:** *Young-old and old-old people do not differ significantly from the younger adult population with regard to their response to 19 months of intense and recurrent terrorism.* (Am J Geriatr Psychiatry 2005; 13:705–712)

The literature on the impact of trauma on elderly persons has been highly inconsistent. One view claims that aged people are a largely weak and vulnerable group, with fewer and more rigid resources for coping with traumatic events than younger persons. They are also at higher risk for adjustment difficulties, posttraumatic stress disorder (PTSD), and depression.[1–3] This attitude is supported by disaster studies that revealed higher vulnerability levels for elderly subjects. A large-scale report on the mental

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health repercussions of the Great Hanshin earthquake of 1996[4] described higher PTSD rates for older people. Depression was more salient in older adults after the 1999 earthquake in Turkey.[5] In a stratified sample of 3,007 adults who survived the 1989 Australian Newcastle earthquake,[6] old age was associated with post-disaster psychological distress. This finding was confirmed in another study of the same disaster in a sample of 515 citizens, which suggested that psychological morbidity persisted longer in older citizens.[7] Mollica et al.[8] observed that old age was related to depression among Bosnian refugees. A study on the psychological distress of 3,564 evacuees of a volcanic eruption in Japan showed that the older (>50) population had more psychological distress up to 44 months after the evacuation.[9] In a study on the psychiatric morbidity of 663 victims of the Chi-Chi earthquake in Taiwan, old age was found to be significantly associated with PTSD.[10] Goenjian et al.[11] found that elderly individuals scored higher on PTSD arousal symptoms and lower on intrusive symptoms after the 1988 earthquake in Armenia. An interesting study on the aftermath of the 1999 Taiwan earthquake reported that age was a definite risk factor for suicide among the victims.[12]

A second view considers the elderly population more resilient, with better adjustment potential to traumatic experience than younger victims.[13–16] A study of tornado victims reported better recovery for the older than for the younger victims.[13] After natural disasters, elderly people expressed less fear, worry, and despair, and more positive emotions than younger adults.[14] Among evacuees of the Hanshin-Awaji earthquake in Japan, a decrease in symptoms among elderly but not younger evacuees was found over a 2-month period.[17]

A study of earthquake victims[18] suggested that having survived a previous earthquake protected elderly subjects from depression. Finally, in a meta-analysis of 160 samples and 60,000 disaster victims,[19] middle- rather than old age was found to increase the likelihood of adverse outcomes, suggesting that elderly persons may typically have a greater degree of resilience.

A third view suggests that elderly persons do not differ from younger adults in their emotional reaction to trauma. This view is supported by studies that revealed no difference in reactions of elderly and younger adults to trauma.[18,20,21]

A fourth view considers coping methods of elderly persons to be dependent upon cultural and social factors. One study, comparing three disaster sites,[22] observed that middle-aged Americans were the most distressed by Hurricane Andrew; younger Mexican victims were more distressed by Hurricane Paulina, whereas Polish elderly persons were more distressed by the 1997 flood. These results suggest that age-related emotional reactions may correlate with the social, economic, cultural, and historical context of the disaster-stricken setting, and not necessarily with a general "maturation" process. An early study of the psychological consequences of Hurricane Hugo showed that middle-aged people expressed more distress than either elderly persons or younger people. These studies suggest that age per-se is not a major factor in determining reactions to disaster and trauma.[23]

The impact of terrorist attacks has been significantly studied only during the last few years, especially since September 11, 2001. Data concerning coping abilities of young-old and old-old subjects who have experienced this type of trauma are scarce and inconsistent.

Terrorism has been shown to adversely affect mental health by creating significant levels of distress and depression in the general population.[24–27] In one of the first large-scale studies of the aftermath of September 11, age was not reported to be a significant predictor of stress reactions.[28] Galea et al.[26] did not find that elderly individuals suffered more from probable PTSD either during the 6 months after 9/11 or the 6 months thereafter.

Other studies assessed the impact of terrorism on elderly persons differently. Cohen-Silver et al.[24] reported a significant relationship between age (over 60) and global distress, but not PTSD, 6 months after the terrorist attacks. Wolinsky et al.[29] reported that older citizens did not reveal decline on measures of stress and mental health but did decline in terms of loss of a sense of control. Chen et al.,[30] in a study of the emotional distress in New York's Chinatown community after 9/11, observed that individuals in the 50–59 age group were most vulnerable to mental health problems. Van Zelst and his colleagues[31] observed an increase in PTSD symptoms for elderly persons after 9/11 in the Netherlands, but no comparison was made with younger adults.

The recent wave of terrorist attacks upon Israeli so-

ciety has left a trail of death and grief. By April 30, 2002, 472 persons (318 civilians) were killed in terrorist attacks, and 3,846 persons (2,708 civilians) were injured. A number of studies reported the impact of these attacks on the civilian population.[32,33] In a study based on the same sample, we found that 16.4% of subjects had been directly exposed to a terrorist attack, and 37.7% had a family member or friend who had been exposed; 9.4% of the population developed PTSD symptom criteria, and 58.6% reported feeling depressed. The most prevalent coping mechanisms were active information search about loved ones and social support.[32] To-date, no study has described the impact of these events on the elderly population.

We report the results of a national, telephone-based survey of young adult (ages 18–64 years), young-old (ages 65–74 years), and old-old citizens (over age 74) conducted in April through May 2002, 19 months after the beginning of the Al-Aksa intifada. We sought to determine the prevalence of symptoms of PTSD in elderly citizens after more than 1½ years of intense terrorist attacks and to identify the correlates of these psychological sequelae in terms of optimism, self-efficacy, and sense of threat. We also assessed the coping modes used to deal with exposure to terrorism and its ongoing threat and compared the reactions of the adult and elderly populations in terms of psychological symptoms and coping. Finally, we attempt to shed some light on the previously-described inconsistencies in the literature regarding the reactions of elderly persons to potentially traumatic disaster situations.

METHODS

Sampling

The present sample was obtained by use of a within-strata, random-sampling method, from a large database maintained by the Israeli Dahaf Institute, a polling organization previously described.[32] The target population for this analysis included all adult Jewish-Israeli residents age 18 years or older. Accordingly, 742 individuals were randomly approached by telephone (82% contact rate). Of these, 69% agreed to participate in the study. After deleting the Arab-Israelis (N = 68) from the sample, we were left with 444 respondents.

The final sample consisted of 223 men (50.2%) and 221 women (49.8%); mean age: 43.64 (standard deviation [SD]: 15.9 years; range: 18–85), with 385 (73.9%) individuals under 65 years old (mean age: 39.5; SD: 12.6); N = 41 (9.2%) between 65 and 74 years old (mean age: 67.3; SD: 2.8); N = 18 (4.1%) older than age 74 (mean age: 78.2; SD: 2.8). Table 1 presents the demographic data of the sample, which closely resembles the demographic distribution of the Israeli population as presented by the Israeli Bureau of Statistics for the year 2002.[32]

Data Collection

Data were collected with a structured questionnaire consisting of 51 items drawn from several questionnaires widely used in the study of reactions to trauma and coping. These questionnaires measure exposure to traumatic events, traumatic stress-related symptoms (TSRSs), feelings of depression, sense of safety, self-efficacy, future orientation, and means of coping.

Except as otherwise indicated below, the participants were asked to reply to the questions with respect to the previous 18 months, which is approximately the time that had elapsed since the beginning of the Intifada. Validation procedures and reliability were described earlier.[32]

Measures

Age. Participants were divided into three age-groups: younger adults (18–64), young-old adults (65–74), and old-old adults (75+ years).

Exposure. Participants were asked 1) whether they had been exposed to a terrorist attack; 2) whether a friend or family member had been exposed to an attack; and 3) whether they were injured in an attack or whether a friend or family member was injured or killed. On the basis of these three questions, we divided the participants into six exposure groups, each based on one combination of a Yes/No reply to the above questions.

Level of Objective Threat was determined by two criteria. First, all individuals who lived in either Jerusalem, Tel-Aviv, Netanya, or Haifa (the four cities where most of the suicide bombings occurred), and those who lived in the West Bank or Gaza settlements were grouped together and compared with those who lived elsewhere in Israel. Second, individuals living in urban versus non-urban areas were compared, after those living in the settlements were removed from the sample.

Sense of Safety was assessed with two items developed specifically for this study regarding respondents' sense of threat to themselves and their relatives.

Self-Efficacy was evaluated with a single item asking participants to indicate whether they would know what to do if they were caught in a terrorist attack.

Means of Coping were assessed with a modified version of the COPE questionnaire,[34] which consists of 13 questions referring to distinct coping methods. Participants were asked to indicate, on a 5-point scale, how often they used each means of coping. They were also asked whether or not they found the means of coping they endorsed helpful. For the factor analysis of the COPE, we first removed the two items relating to cigarettes, alcohol, and tranquilizer use, which we considered separate a-priori factors. A principal-components analysis with Varimax rotation, an eigenvalue above 1, and absolute values above 0.5 produced a four-factor solution composed of Social Action (talking about feelings; talking about the situation and what can be done; checking on friends and family; support from family and friends; information-gathering); Avoidance (avoiding media; self-distraction through activity); Disengagement (coming to terms with the situation; having faith in God); and Detached Coping (trying to ignore the situation; using humor). Cigarette/Alcohol and Tranquilizer Use was added as a separate a-priori factor in the analyses. This factor structure partially reproduces Lyne and Roger's[35] radial parcel analysis and Roger et al.'s[36] factor analysis of the original questionnaire.

Trauma- and stress-related mental health symptoms. We used a modified version of the Stanford Acute Stress Reaction Questionnaire (SASRQ).[37] The SASRQ has acceptable statistical properties and has been used in trauma-related surveys. It includes 23 statements, each of which refers to a specific stress-related symptom or behavior. Participants were asked to rate the extent to which each statement applied to themselves and to report the duration for which they experienced the related emotions or behaviors.

Because our observations were done with screening instruments and not on the basis of comprehensive clinical evaluations, the participants were not clinically diagnosed with PTSD, but, rather, were identified as having an aggregation of symptoms that met the criteria for PTSD.

Distressing memories. One item asked whether the current events evoked distressing memories, and, if so, memories of what events.

Feelings of depression. Participants were asked: How sad and gloomy do you feel?

Optimism. Optimism was assessed with two items drawn from the Future Orientation Scale,[38] which evaluated optimism regarding respondents' personal future and the future of Israel.

Need for help. We asked the participants whether they had phoned any of the hotlines to seek professional help.

Demographic characteristics. Data were collected for gender, age, education, year of immigration, income, religiosity, ethnic origin, place of residence, and place of birth.

TABLE 1. Demographic Variables Comparing Younger Adults, "Young-Old," and "Old-Old" Citizens, Percent

	Younger Adults, Age 18–64 (N=385)	Young-Old, Age 65–74 (N=41)	Old-Old, Age >74 (N=18)	$\chi^2_{[df]}$; p
Gender				$3.6_{[2]}$; p=0.16
Male	49.4	48.8	27.8	
Female	50.6	51.2	72.2	
Education				$18.8_{[4]}$; p=0.001
Elementary	2.4	10.0	17.6	
High school	42.5	50.0	23.5	
Post-high school	55.1	40.0	58.8	
Country of birth				$37.7_{[2]}$; p=0.001
Israel	62.3	24.4	11.1	
Outside of Israel	37.7	75.6	88.9	
Religiosity				$2.3_{[2]}$; p=0.32
Non-religious	56.3	43.9	55.6	
Religious	43.7	56.1	44.4	
Income				$15.5_{[4]}$; p=0.004
Less than average	32.3	41.7	76.5	
Average	33.3	33.3	11.8	
Above average	34.5	25.0	11.8	

Statistical Analyses

Years of education, immigration year, income, and number of TSRSs were analyzed as continuous data. Age, gender, ethnic background, religiosity, residence (town, community, settlement, kibbutz, urban/non-urban), place of birth (Israel/elsewhere), symptoms of PTSD, coping modes, optimism, sense of threat, and self-efficacy were analyzed as categorical data. When continuous data were considered categorical, this was done by considering an item positive if the respondent answered at least "moderately" on the specific item. ANOVA for continuous data and chi-square tests for categorical data were performed where necessary. Fisher's exact tests were performed where the expected N for any cell was found to be less than 5. Because of the large number of analyses performed, the significance level was set at $p < 0.01$. SPSS-PC Version 11.0 (SPSS Inc, Chicago, Ill) was used for all analyses.

TABLE 2. A Comparison of Younger Adults, "Young-Old," and "Old-Old" Subjects for Trauma Exposure, Posttraumatic Stress Disorder (PTSD), and Related Psychological States, Percent

	Younger Adults (N = 385)	Young-Old (N = 41)	Old-Old (N = 18)	$\chi^2_{[df]}$; p; Fisher's Exact Test (p); or ANOVA (p)
Exposure				$6.6_{[10]}$; p = 0.76
Not exposed/don't know anyone exposed	50.1	61.0	66.7	
Not exposed/know someone exposed	14.5	14.6	0	
Not exposed/know someone hurt	17.9	12.2	22.2	
Exposed/don't know anyone exposed	8.1	4.9	5.6	
Exposed/know someone exposed	3.6	2.4	0	
Exposed/know someone hurt	5.7	4.9	5.6	
Objective threat				
Residing in high-risk area	19.5	26.8	33.3	$3.0_{[2]}$; p = 0.22
Residing in urban area	91.2	87.8	100	$2.3_{[2]}$; p = 0.31
Posttraumatic symptomatology				
At least one acute stress symptom	78.7	73.2	83.3	$0.9_{[2]}$; p = 0.62
At least one intrusive symptom	38.2	36.6	50.0	$1.1_{[2]}$; p = 0.58
At least one avoidance symptom	59.2	48.8	50.0	$1.2_{[2]}$; p = 0.34
At least one hyperarousal symptom	48.6	41.5	72.2	$4.8_{[2]}$; p = 0.09
Disruption in occupational functioning	22.6	29.3	38.9	$3.2_{[2]}$; p = 0.20
At least one dissociative symptom	25.2	29.3	38.9	$1.9_{[2]}$; p = 0.38
Depersonalization	12.5	26.8	16.7	$6.4_{[2]}$; p = 0.04
De-realization	13.3	7.3	11.1	$1.2_{[2]}$; p = 0.53
Amnesia	12.8	12.2	27.8	$3.4_{[2]}$; p = 0.18
Emotional numbness	15.1	31.7	22.2	$7.6_{[2]}$; p = 0.02
PTSD	10.4	9.8	5.6	$0.45_{[2]}$; p = 0.80
Sleeplessness	20.5	31.7	38.9	$5.6_{[2]}$; p = 0.06
Re-experiencing unwanted thoughts	25.7	39.0	44.4	$5.9_{[2]}$; p = 0.05
Avoidance	35.9	36.6	11.1	$4.7_{[2]}$; p = 0.09
Traumatic stress-related symptoms (TSRSs), mean (standard deviation)				$F_{[2]} = 0.3$; p = 0.71
Average number of TSRSs	4 (4.4)	4.5 (4.9)	4.6 (4.1)	
Depression and distress				
Feeling of depression	55.3	73.2	61.1	$4.9_{[2]}$; p = 0.08
Feeling distressed	58.7	72.5	66.7	$3.2_{[2]}$; p = 0.20
Future orientation				
Optimistic about your personal future	84.2	73.2	55.6	$11.9_{[2]}$; p = 0.003
Optimistic about the country's future	67.5	63.4	72.2	$0.49_{[2]}$; p = 0.78
Sense of safety				
Threat to your own life	63.5	56.1	52.9	$1.6_{[2]}$; p = 0.46
Threat to lives of those close to you	70.1	67.5	77.8	$0.64_{[2]}$; p = 0.73
Self-efficacy and remembering				
Sense of self-efficacy	78.0	76.5	62.5	$2.1_{[2]}$; p = 0.35
Evokes powerful personal associations	21.4	56.1	66.7	$38.7_{[2]}$; p = 0.001
Evokes associations with World War II	1.8	12.2	11.1	$17.8_{[2]}$; p = 0.001
Help-seeking				
Called a hotline	10.2	19.0	47.1	$23.3_{[2]}$; p = 0.001

TABLE 3. Coping Strategies Used and Felt to Be Helpful and Number of Coping Factors Used, Percent

Coping Strategy	Younger Adults, Age 18–64 (N=385)	Young-Old, Age 65–74 (N=41)	>Age 74 (N=18)	$\chi^2_{[df]}$; p
Use of social action	99.2	100	99.3	$0.5_{[2]}$; p=0.8
Use of avoidance	50.8	43.9	49.2	$4.1_{[2]}$; p=0.1
Use of disengagement	88.5	87.8	66.7	$7.6_{[2]}$; p=0.02
Use of detached coping	47.9	41.5	33.3	$1.9_{[2]}$; p=0.4
Use of cigarettes, alcohol, or tranquilizers	9.6	19.5	33.3	$12.3_{[2]}$; p=0.002
Helped by social action	86.6	85.4	88.9	$0.13_{[2]}$; p=0.9
Helped by avoidance	79.9	66.7	80.0	$1.7_{[2]}$; p=0.4
Helped by disengagement	80.4	50.0	91.7	$19.0_{[2]}$; p=0.002
Helped by detached coping	80.1	76.9	83.3	$0.24_{[2]}$; p=0.9
Helped by use of cigarettes, alcohol, or tranquilizers	69.4	100	83.3	$3.5_{[2]}$; p=0.1
Number of coping factors used, mean (standard deviation)	2.9 (0.8)	2.7 (0.8)	2.2 (0.9)	$F_{[2]}=4.4$; N=441; p=0.01

RESULTS

Demographic differences between the young-old, old-old, and younger-adult populations are presented in Table 1. No difference was found in the level of exposure or on any of the major or secondary traumatic stress symptomatology measures except that there was a nonsignificant tendency toward a higher rate of emotional numbness and depersonalization in the 65–74 age-group. Also, we found nonsignificant tendencies toward more re-experiencing of unwanted thoughts in both the young-old and the old-old group, as compared with younger adults. Younger age was found to be significantly related to more optimism about one's personal future, but not optimism concerning Israel's future. The young-old and old-old age-groups used hotlines more often.

Also, the current terrorist attacks evoked more powerful personal memories, as well as more memories from World War II and the Holocaust in the two older age-groups (Table 2). The coping strategy utilized most by all age-groups was Active Support, followed by Disengagement. There was a nonsignificant tendency for old-old subjects to disengage less than both the young-old and the younger age-group. Generally, aside from Use of Cigarettes/Drugs or Tranquilizers, Detached Coping was the least-used coping strategy. There was a significant linear relationship with respect to Cigarette/Alcohol and Tranquillizer Use across the age-groups. Also, Disengagement was considered significantly less helpful in elderly persons. Old-old adults were found to use fewer coping strategies than younger adults (Table 3).

Further analysis to discern the possible interactions of older age with exposure, gender, education, and the influence of personal associations on all the above-mentioned trauma-related variables did not yield significant results.

DISCUSSION

Because the current terrorist events evoked more powerful personal associations and associations with World War II in the young-old and old-old respondents, and because elderly persons and younger adults were equally exposed to terrorist attacks, and considering that much of the literature regards aged persons as vulnerable and less resilient, the fact that there was no difference between elderly persons and younger adults' responses to traumatic events is rather surprising. Although we found some nonsignificant tendencies in terms of coping strategies that distinguished the three groups, we found, unequivocally, that all three adult groups were similarly affected by terrorist attacks. These findings seem to support the view that vulnerability and resilience to stress are not age-dependent and that elderly persons do not differ from younger adults in their emotional reactions to the types of terrorist attacks experienced in Israel during the previous 19 months.

The less robust differences observed may be due to two factors. The first is related to minor differences in coping styles, implying slightly more arousal, depersonalization, emotional numbness, pessimism, sleeplessness, and the re-experiencing of unwanted thoughts, as well as the use of tranquilizers and utilization of telephone hotline support. Secondly, differ-

ences may be recognized as age-associated problems, such as sleep disturbances, pessimism, distress, loneliness, and depression, as well as having smaller social support networks.

The present wave of terrorist attacks does not seem to have affected elderly persons and the younger adult population differently than previous national traumatic events. Studies have suggested that during the first Gulf War, most of the elderly citizens continued to function adequately and did not differ from the rest of the population in severity of reported depressive mood or distress. They also used similar cognitive coping strategies.[38]

A sub-population of elderly Israeli individuals that was more vulnerable to war-related stress during the first Gulf war included Holocaust survivors.[37] During the present crisis, and, contrary to the Gulf war, where specific images of the danger of biological warfare reawakened dormant and not-so-dormant memories of the Nazi Holocaust, the present situation fostered a feeling of togetherness, community, and mutual help. So, although elderly persons indeed had stronger previous associations to traumatic events, including the Holocaust, this was not associated with higher levels of distress during the terrorist attacks.

An additional factor, which, in times of war, has been seen to exacerbate feelings of separateness and remoteness within the older generation,[39] is the fact that most of the war effort is shouldered by the younger generation. During the present conflict, since members of all populations are potential victims of terrorist attacks,[32] there is a sense of solidarity and common destiny among all factions and age-groups in Israeli society.

Repeated exposure to terrorist events in the media made many individuals feel like victims of terrorism, but that ongoing exposure also had a desensitizing effect. These paradoxical influences generated increasing levels of distress in most individuals, even if they were not directly involved, and buffered the impact of those same traumatic events by repeated exposure and habituation. All individuals were affected in a similar manner, regardless of demographic factors such as income, education, ethnicity (Arab or Jew),[32] or age. Since old-old people are generally more confined to their homes and therefore may watch more television, these combined effects may have been even more evident in this population.

Our results may explain some previously described inconsistencies in the literature. It seems that certain coping strategies and reactions reflect the various ranges along the "elderly" age-continuum quite differently. On one hand, some relationships are linear: for example, more sleeplessness, re-experiencing of unwanted thoughts, and pessimism as one grows older. This was confirmed by post-hoc correlations of the intensity of the above-mentioned symptoms with age as a continuous variable (respectively, Pearson $r = 0.26$; 0.23, and 0.23; $p = 0.001$ and $N = 444$ for all analyses).

On the other hand, the present traumatic stress may also have a specific impact on the 65–74 age-group in terms of emotional numbness and depersonalization, as reflected in findings from a post-hoc analysis that revealed a significant difference between the 65–74 and the aggregate score of the two other groups on the above-mentioned results (emotional numbness: younger and old-old: 15.4%, young-old: 31.7%; $\chi^2_{[2]} = 7.1$; $p = 0.008$; depersonalization: younger and old-old: 12.7%, young-old: 26.8%; $\chi^2_{[2]} = 6.1$; $p = 0.01$).

A further finding is that the >74 age-group relied on fewer support factors, and almost half of that group used hotlines. This may suggest less flexibility and/or fewer coping resources for such situations, due either to their relative social isolation or to less effective coping abilities. A further assumption might be that this age-group utilized available coping strategies more effectively.

This study has a number of major limitations, including the lack of a comparative measure before the terrorist attacks and a relatively small number of individuals in the >74 age-group. Caution should be taken in the generalization of findings to other elderly populations, such as institutionalized individuals.

In conclusion, young-old and old-old Israelis do not differ from younger-adult populations with regard to their response to the threat of terrorism, and, as such, probably do not constitute a specific high-risk group that demands more therapeutic attention than the younger members of the population.

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