



Late-Life Mortality in Older Jews Exposed to the Nazi Regime

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OBJECTIVES: To evaluate the mortality risk associated with exposure to the Nazi regime 6 decades after the war.

DESIGN: A national representative survey with 7-year follow-up data.

SETTING: A national representative survey of Israeli Jews aged 60 and older conducted in 1997 and 1998.

PARTICIPANTS: Four thousand one hundred seventy-nine Israeli Jews participated in the study. To evaluate the mortality risk associated with exposure to the Nazi regime, Cox proportional-hazards models were used, controlling for age, sex, education, religiousness, mental health, sleep disturbance, and baseline health.

MEASUREMENTS: A 7-year follow-up of all-cause mortality.

RESULTS: Of the 4,179 Israeli Jews who participated in the study, 1,472 (35%) self-identified as being exposed to the Nazi regime, defined as having lived in a country that was under the Nazi occupation or directly ruled by the Nazi regime. There was no statistically significant difference in mortality rate between those exposed to the Nazi regime (29.8%) and those who were not (27.5%) (adjusted hazard ratio = 1.01, 95% confidence interval = 0.88–1.15).

CONCLUSION: Israeli Jews who survived exposure to the Nazi regime are not at greater risk for death than the general population of Israeli Jews in later life. It is unclear whether these individuals represent a particularly resilient group or whether the risks of psychological trauma on mortality are mitigated over time. *J Am Geriatr Soc* 2007.

Key words: Holocaust; psychological trauma; mortality; resilience; World War

For example, early studies on non-Jewish concentration camp survivors found that concentration camp experience was a risk for mortality,⁴ but more recent studies found no such relationship.^{5,6} Similarly, several studies of army veterans found that war exposure was not associated with greater mortality risk.^{7–9} Thus, the “survival of the fittest” or “the surviving survivors” phenomenon was suggested,¹⁰ which hypothesizes that trauma affects individuals in close time proximity to its occurrence but no longer affects those who survive its early detrimental effects and may even be more resilient than the general population.

No doubt, exposure to the Nazi regime was one of the most horrific events in human history. Even 6 decades after the Holocaust, the study of survivors still has relevance as a means to understanding the long-term effects of exposure to severe psychological trauma. Research on the topic can improve our understanding and ability to assist not only survivors of the Nazi regime who are still alive and are now reaching old age, but also survivors of more recent genocides and atrocities.

This study provides a unique opportunity to evaluate the effect of early-life exposure to severe psychological trauma on late-life mortality. The goal was to evaluate whether exposure to the Nazi regime of Jewish residents in Israel is a risk factor for all-cause mortality. A population-based database of older Israeli Jews that contained information on the degree of exposure to the Nazi regime was used. To the authors' knowledge, this is the first nationally representative study examining whether early-life exposure to the Nazi regime affects mortality risk decades later.

METHODS

Sample

In 1997 and 1998, the Israeli Central Bureau of Statistics conducted a face-to-face national survey of Israelis aged 60 and older to gain a broad perspective on the lives of older adults in Israel. This was the first time that an evaluation of exposure to Nazism was performed in a national survey. Israel National Insurance, JDC Brookdale, Eshel, the American Jewish Joint Distribution Committee, and the Israel Ministries of Health, Absorption, Finances, and Welfare funded the survey. The Israeli Central Bureau of Statistics conducted a random sample of all individuals born before 1938 using data from the 1995 census to guide the sampling procedure. A stratified sampling method was employed to

The detrimental short-term effects of psychological trauma on morbidity and mortality are well known,^{1–3} although it is unclear whether long-term survivors of severe psychological trauma are at greater risk for mortality than those who did not experience such trauma.

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obtain representation of older Jews who came to Israel before 1989, those who came to Israel after 1990, and Arabs. Sampling also obtained representations of those living alone, living with a partner, and living with younger people. Males and females were stratified based on age (60–64, 65–69, 70–74, 75–79, ≥ 80). The sampling population did not include those who lived outside of Israel for more than a year, those who lived in long-term care settings other than senior housing, those who were hospitalized for longer than 6 months, and those who lived in a kibbutz or a moshav. The final sample included 5,055 individuals, yielding a response rate of 83.2%. Only those who self-identified as Jewish were included in this study ($N = 4,179$).

Measures

Time to death was obtained from Israel's National Death Record, available for 1997 to 2004. All other information was gathered in a face-to-face interview conducted by trained interviewers during 1997 and 1998.

Predictor

Exposure to the Nazi Regime

Exposure to the Nazi regime was evaluated using the following question: "Have you ever lived in a country that was under the Nazi occupation or directly ruled by the Nazi regime?" For the primary definition of exposure to the Nazi regime, subjects were classified as exposed only if they self-identified as having lived under the Nazi regime. In an additional sensitivity analysis, a more-inclusive definition of exposure was used that included subjects who self-identified as having lived under the Nazi regime and subjects who fled from areas occupied by the Nazi regime just before, during, or after the occupation. The Israeli Central Bureau of Statistics identified this group of individuals who did not self-identify as having lived under the Nazi regime but had fled the Nazi regime by crossing information about time and place of residency with historic information about the Nazi occupation.

Degree of Exposure to the Nazi Regime

In an additional sensitivity analysis, severity of exposure to the Nazi regime was classified. Subjects were classified as having no exposure, moderate exposure, or severe exposure. Subjects were classified as having moderate exposure if they were exposed to the Nazi regime (using the more-inclusive definition described above) but did not report that they lived in hiding, in a ghetto, in a work camp, or in a concentration or extermination camp. Subjects who reported any of these markers of severe trauma were classified as having severe exposure. Those with severe exposure were further divided into those exposed in one setting and those exposed in more than one setting.

Outcome Variable: Time of Death

All Israelis have a unique identification number that was used by the Israeli Central Bureau of Statistics to link the survey with Israel's National Death Record, which contains information about all deaths occurring in Israel. Year of death was available for 1997 to 2004.

Covariates

Demographics

Age, marital status, and level of education were evaluated based on self-report.

Religiousness

The question, "How frequently do you visit the synagogue" was used as a proxy for religiousness. Response options were: daily or almost daily, only on the weekend and holidays, only on certain high holidays, only on special occasions, and not at all.

Health

Health was evaluated using the question, "Have you ever been diagnosed with any of the following conditions: hypertension, heart attack or myocardial infarction, stroke, diabetes mellitus, asthma, cataract or glaucoma, cancer, herniated disk, a broken hip, Alzheimer's disease, osteoporosis, or Parkinson's disease." This list of common medical conditions was created to reflect prevalent medical conditions in old age. The list was created based on expert advice and was previously used in the 1985 sample of older adults in Israel.¹¹ Summing up all "yes" responses, these responses were categorized into no health problems, one to two health problems, or more than two health problems.

Mental Health

Mental health was evaluated according to the following 11 questions: "Do you feel stressed?" "Do you feel unhappy?" "Do you feel that you are doing things well?" "Do you feel you can make your own decisions?" "Can you enjoy everyday activities?" "Can you deal with your own problems?" "Do you feel happy overall?" "Do you feel life is not worth living?" "Can you concentrate?" "Do you feel full of energy?" "Do you feel that you have lost your self-confidence?" Scored responses were reversed to positive items so that a higher score would reflect worse mental health. This variable was categorized as no mental health problems, mild mental health problems, and moderate to severe mental health problems.

Sleep Disturbance

Sleep disturbance was evaluated according to the following question: "Do your worries interfere with your sleep?" This item was included as a covariate, because past research has shown that sleep disturbance is a prominent indicator of posttraumatic stress disorder.¹²

Instrumental Activities of Daily Living

Instrumental activities of daily living (IADLs) were evaluated using the following five questions from the Lawton and Brody index of IADLs¹³: "Do you need assistance or additional assistance in any of the following: preparing meals, cleaning the house, doing the laundry, grocery shopping, and running errands?" This variable was categorized to represent no impairment (0 IADL impairments), moderate impairment (1–2 IADL impairments), and severe impairment (> 2 IADL impairments).

Activities of Daily Living

Activities of daily living (ADLs) were evaluated using five questions from the Katz index of ADLs¹⁴: "Can you, with-

out any assistance, dress, bathe or shower, sit down or get up from a chair, get in and out of bed, and eat.” Response options were: yes with no difficulty, yes with some difficulty, and cannot. This variable was categorized to represent no impairment (0 ADL impairments), moderate impairment (1–2 ADL impairments), and severe impairment (>2 ADL impairments).

Statistical Analysis

A Cox proportional hazards model was conducted, with time to death as the outcome variable and exposure to the Nazi regime as the predictor. Those who did not die within the study period (1997–2004) were censored at the end of

the period (2004). Age, sex, level of education, frequency of visits to the synagogue, mental health, sleep disturbance, and baseline health (ADLs, IADLs, and number of medical conditions) were controlled for. The same analyses were repeated with degree of exposure to the Nazi regime as the predictor and time to death as the outcome. All analyses were conducted on the entire sample of Israeli Jews (N = 4,179).

RESULTS

For 3% of the sample (n = 127), information was obtained based on proxy report rather than self-report, primarily because of the medical condition of the interviewee. Table 1

Table 1. Demographic and Clinical Characteristics of the Sample (N = 4,179)

Characteristic	Self-Reported Exposure to the Nazi Regime		Degree of Exposure to the Nazi Regime				P-Value
	Lived under Nazi Occupation (n = 1,472)	Did Not Live under Nazi Occupation (n = 2,707)	No Exposure* (n = 2,079)	Moderate Exposure† (n = 1,369)	1 Severe Exposure‡ (n = 423)	> 1 Severe Exposures‡ (n = 308)	
	n (%)		n (%)				P-Value
Age							<.001
60–74	759 (51.6)	1,640 (60.6)	1,302 (62.6)	725 (53.0)	207 (48.9)	165 (53.6)	
75–84	557 (37.8)	813 (30.0)	575 (27.7)	518 (37.8)	160 (37.8)	117 (38.0)	
≥85	156 (10.6)	254 (9.4)	202 (9.7)	126 (9.2)	56 (13.2)	26 (8.4)	
Female	723 (49.1)	1,341 (49.5)	1,009 (48.5)	731 (53.4)	182 (43.0)	142 (46.1)	.001
Level of education, years							.001
<8	601 (40.8)	1,175 (43.4)	1,014 (48.8)	415 (30.3)	209 (49.4)	138 (44.8)	<.001
9–12	484 (32.9)	746 (27.6)	587 (28.2)	391 (28.6)	129 (30.5)	123 (39.9)	
≥13	387 (26.3)	786 (29)	478 (23.0)	563 (41.1)	85 (20.1)	47 (15.3)	
Frequency synagogue visits							<.001
Daily or almost daily	100 (6.8)	264 (9.8)	252 (12.2)	55 (4.0)	33 (7.8)	24 (7.8)	
Only on weekends and holidays	167 (11.4)	428 (15.9)	386 (18.6)	101 (7.4)	64 (15.2)	44 (14.4)	
Only on high holidays	460 (31.4)	752 (27.9)	534 (25.8)	424 (31.1)	139 (32.9)	115 (37.6)	
Only on special occasions	91 (6.2)	136 (5.0)	122 (5.9)	65 (4.8)	24 (5.7)	16 (5.2)	
Not at all	649 (44.2)	1,116 (41.2)	776 (37.5)	720 (52.7)	162 (38.4)	107 (35.0)	
Activity of daily living impairment							.009
0	1,146 (77.9)	1,991 (73.6)	1,528 (73.9)	1,051 (76.8)	317 (74.9)	241 (78.2)	
1–2	130 (8.8)	253 (9.3)	191 (9.2)	125 (9.1)	42 (9.9)	25 (8.1)	
>2	196 (13.3)	451 (16.7)	349 (16.9)	192 (14.0)	64 (15.1)	42 (13.6)	
Instrumental activity of daily living impairments							.98
0	617 (41.9)	1137 (42.0)	895 (43.0)	559 (40.8)	182 (43.0)	118 (38.3)	
1–2	322 (21.9)	586 (21.6)	442 (21.3)	295 (21.5)	94 (22.2)	77 (25.0)	
>2	533 (36.2)	984 (36.4)	742 (35.7)	515 (37.6)	147 (34.8)	113 (36.7)	
Number of diseases							<.001
0	262 (17.8)	695 (25.7)	541 (26.4)	282 (20.8)	90 (21.4)	44 (14.4)	
1–2	850 (57.7)	1,461 (54)	1,096 (53.4)	803 (59.3)	240 (57.1)	172 (56.4)	
>2	345 (23.4)	518 (19.1)	415 (20.2)	269 (19.9)	90 (21.4)	89 (29.2)	
Mental health problems							.40
None	420 (28.5)	711 (26.3)	558 (28.0)	363 (27.2)	118 (28.6)	92 (30.4)	
Mild	428 (29.1)	813 (30)	631 (31.7)	407 (30.4)	124 (30.1)	79 (26.1)	
Moderate to severe	595 (41.2)	1,076 (39.7)	802 (40.3)	567 (42.4)	170 (41.3)	132 (43.6)	
Sleep disturbance	657 (45.8)	1,173 (43.3)	936 (47.3)	546 (41.0)	190 (46.2)	158 (52.7)	<.001

* Exposure is defined as self-report of living under the Nazi regime or having fled from the Nazi regime or occupation.
 † Moderate exposure is defined as being exposed to the Nazi regime or occupation but not having lived in hiding, in a ghetto, in a work camp, or in a concentration or extermination camp.
 ‡ Severe exposure is defined as having lived in hiding, in a ghetto, in a work camp, or in a concentration or extermination camp.

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summarizes the demographic and clinical characteristics of the sample. Overall, 35% ($n = 1,472$) of the sample self-identified as having lived under the Nazi regime. There were significant differences in age, level of education, frequency of visits to the synagogue, number of ADL impairments, and number of medical conditions between those exposed to Nazism and those who were not. When the more-inclusive definition of exposure was used (those who reported living under the Nazi regime and those who did not report living under a Nazi regime but fled from areas under Nazi occupation), 2,100 (50.2%) individuals were considered to have been exposed to the Nazi regime. This included 1,369 (32.8%) subjects with moderate exposure (not in hiding, a ghetto, a work camp, or a concentration or extermination camp) and 731 (17.5%) with severe exposure (in hiding, a ghetto, a work camp, or a concentration or extermination camp). Of those, 308 (7.4%) had more than one severe exposure (Table 2).

Using the primary definition of exposure, there was no statistically significant difference in all-cause mortality between those exposed to the Nazi regime and those who were not (29.8% vs 27.5%, unadjusted hazard ratio (HR) = 1.08, 95% confidence interval (CI) = 0.95–1.22). The HR remained nonsignificant after adjustment for age and sex (adjusted HR = 0.96, 95% CI = 0.85–1.09), as well as for age, sex, education, frequency of visits to the synagogue, mental health, sleep disturbance, and baseline health (adjusted HR = 1.01, 95% CI = 0.88–1.15). There was no interaction between exposure to the Nazi regime and age (HR = 0.91, 95% CI = 0.76–1.09) or exposure to the Nazi regime and sex (HR = 0.85, 95% CI = 0.65–1.11). As expected, age, sex, frequency of visits to the synagogue, number of ADL impairments, number of IADL impairments, number of diseases, mental health, and sleep disturbance were significant predictors of mortality (Tables 2 and 3).

In an additional sensitivity analysis, a more-inclusive definition of exposure we used that also included those who did not self-identify as living under the Nazi regime but fled from areas under the Nazi occupation. Once again, there was no statistically significant difference in all-cause mortality between those exposed to the Nazi regime and those who were not (29.9% vs 26.7%; unadjusted HR = 1.11, 95% CI = 0.98–1.24). The HR remained nonsignificant after adjustment for age and sex (adjusted for age and sex HR = 1.01, 95% CI = 0.90–1.14), as well as once adjusted for age, sex, education, frequency of visits to the synagogue, mental health, sleep disturbance, and baseline health (fully adjusted HR = 1.02, 95% CI = 0.90–1.17) (Table 2).

In the final sensitivity analysis, the relationship between severity of exposure and mortality was examined. Overall mortality was 26.6% in those not exposed to the Nazi regime, 28.8% (unadjusted HR = 1.07, 95% CI = 0.94–1.23, adjusted for age and sex HR = 1.01, 95% CI = 0.88–1.16, fully adjusted HR = 1.01, 95% CI = 0.87–1.17) in those with moderate exposure (did not report being in a setting suggesting severe trauma), 36.2% in those with severe exposure in one setting (unadjusted HR = 1.37, 95% CI = 1.14–1.66, adjusted for age and sex HR = 1.13, 95% CI = 0.94–1.37, fully adjusted HR = 1.13, 95% CI = 0.93–1.38), and 26.6% in those with severe exposure in two settings (unadjusted HR = 0.92, 95% CI = 0.72–

Table 2. Baseline Characteristics and Mortality During 7-Year Follow-Up (N = 4,179)

Characteristic	Baseline	Deaths
	n (%)	
Self identified exposure versus no exposure		
No exposure	2,707 (64.8)	744 (27.5)
Exposure	1,472 (35.2)	439 (29.8)
Exposure versus no exposure		
No exposure	2,082 (49.8)	556 (26.7)
Exposure (including those who fled from areas under Nazi occupation)	2,097 (50.2)	627 (29.9)
Degree of exposure		
None*	2,082 (49.8)	556 (26.7)
Moderate†	1,369 (32.8)	394 (28.8)
1 severe‡	423 (10.1)	153 (36.2)
> 1 severe‡	308 (7.4)	82 (26.6)
Age		
60–74	2,399 (57.4)	361 (15.0)
75–84	1,370 (32.8)	528 (38.5)
≥85	410 (9.8)	294 (71.7)
Sex		
Male	2,115 (50.6)	691 (32.7)
Female	2,064 (49.4)	492 (23.8)
Level of education, years		
> 8	1,776 (42.5)	596 (33.6)
9–12	1,230 (29.4)	290 (23.6)
≥13	1,173 (28.1)	297 (25.3)
Frequency of visits to the synagogue		
Daily or almost daily	364 (8.7)	85 (23.4)
Only on weekends and holidays	595 (14.3)	153 (25.7)
Only on high holidays	1,212 (29.1)	264 (21.8)
Only on special occasions	227 (5.5)	47 (20.7)
Not at all	1,765 (42.4)	626 (35.5)
Activity of daily living impairments		
0	3,137 (75.2)	620 (19.8)
1–2	383 (9.2)	156 (40.7)
> 2	647 (15.5)	401 (62)
Instrumental activity of daily living impairment		
0	1,757 (42.0)	257 (21.7)
1–2	908 (21.7)	232 (19.6)
> 2	1,517 (36.3)	694 (58.7)
Number of diseases		
0	957 (23.2)	178 (18.6)
1–2	2,311 (55.9)	647 (28)
> 2	863 (20.9)	334 (38.7)
Mental health problems		
None	1,131 (28)	181 (16.0)
Mild	1,241 (30.7)	289 (23.3)
Moderate to severe	1,671 (41.3)	609 (36.4)
Sleep disturbance		
No	2,193 (54.5)	575 (26.2)
Yes	1,830 (45.5)	496 (26.1)

* Exposure is defined as self-report of living under the Nazi regime or having fled from the Nazi regime or occupation.

† Moderate exposure is defined as having been exposed to the Nazi regime or occupation but not having lived in hiding, in a ghetto, in a work camp, or in a concentration or extermination camp.

‡ Severe exposure is defined as having lived in hiding, in a ghetto, in a work camp, or in a concentration or extermination camp.

Table 3. Hazard Ratios (HR) and 95% Confidence Intervals (CI) with Exposure to the Nazi Regime versus no Exposure as the Predictor (N = 4,179)

Characteristic	Unadjusted		Adjusted*		Adjusted†	
	Hazard Ratio (95% Confidence Interval)		P-Value		P-Value	
Self-identified exposure versus no exposure						
No exposure (reference)						
Exposure	1.08 (0.95–1.22)	.21	0.96 (0.85–1.09)	.55	1.01 (0.88–1.15)	.86
Age						
60–74 (reference)						
75–84			2.92 (2.54–3.35)	<.001	2.12 (1.82–2.46)	<.001
≥85			7.23 (6.15–8.49)	<.001	4.06 (3.36–4.91)	<.001
Sex						
Male (reference)						
Female			0.68 (0.60–0.77)	<.001	0.48 (0.41–0.55)	<.001
Level of education, years						
> 8						
9–12					0.90 (0.77–1.06)	.23
≥13					0.88 (0.75–1.03)	.12
Frequency of visits to the synagogue						
Daily or almost daily						
Only on weekends and holidays					1.40 (1.06–1.81)	.02
Only on high holidays					1.31 (1.00–1.71)	.03
Only on special occasions					1.60 (1.10–2.30)	.01
Not at all					1.79 (1.39–2.30)	<.001
Activity of daily living impairments						
0 (reference)						
1–2					1.44 (1.18–1.77)	<.001
> 2					1.89 (1.57–2.27)	<.001
Instrumental activity of daily living impairments						
0 (reference)						
1–2					1.53 (1.26–1.87)	<.001
> 2					1.91 (1.56–2.34)	<.001
Number of diseases						
0 (reference)						
1–2					1.21 (1.01–1.45)	.03
> 2					1.38 (1.12–1.70)	.002
Mental health problems						
None (reference)					1.17 (0.95–1.43)	.12
Mild					1.35 (1.09–1.66)	.005
Moderate to severe						
Sleep disturbance						
No (reference)						
Yes					0.79 (0.69–0.91)	.001

* Adjusted for age and sex.

† Adjusted for age, sex, education, frequency of visits to the synagogue, mental health, sleep disturbance, and baseline health.

1.18, adjusted for age and sex HR = .83, 95% CI = 0.64–1.07, fully adjusted HR = 0.91, 95% CI = 0.70–1.19). The higher age and greater proportion of men in this group completely explained the significantly higher unadjusted association between those with one exposure and mortality. As expected, age, sex, frequency of visits to the synagogue, ADL impairments, IADL impairments, number of medical conditions, mental health, and sleep disturbance were significant predictors of mortality (Table 2).

DISCUSSION

Previous research has examined the relationship between exposure to severe psychological trauma and mortality, but few studies have examined whether early-life exposure to severe psychological trauma affects mortality in late life. This population-based study of older Israeli Jews found that early-life exposure to the Nazi regime was not associated with a greater risk for later-life mortality. These findings

were consistent in sensitivity analyses in which a more-inclusive definition of exposure to the Nazi regime was used and those exposed were subdivided into those with exposure suggesting moderate trauma and those with exposure suggesting severe trauma.

Although some studies have found a greater mortality risk associated with traumatic events in non-Jewish Norwegian concentration camp survivors⁴ and in other civilian and military groups exposed to traumatic events,^{15,3} the findings of the current study add to a more recent body of research that suggests that early-life exposure to severe psychological trauma does not pose a greater mortality risk in later life.^{5,6} Despite physical vulnerability and well-documented emotional vulnerability,^{16–18} this group of survivors of the Nazi regime is not at greater risk for mortality than the general population of older adults. Thus, it is highly likely that, in the first few years after severe psychological trauma, psychological trauma serves as a risk for mortality, but for those who survived those early years after the traumatic events, psychological trauma no longer serves as a risk for mortality. Possibly those who survived the detrimental effects of severe psychological trauma and reach old age form a particular group of resilient older adults. An important task is to understand the factors that contribute to resilience in this population exposed to the Nazi regime and to distinguish this group of late survivors from individuals who die in close proximity to traumatic events. Given research that has shown a greater mortality risk for military personnel even 3 decades after the war,¹⁹ it is possible that different traumatic events have a different risk for mortality. Because the majority of survivors of the Nazi regime are now reaching old age or are already dead, there is an urgent need to identify these factors. There also is a need to further explore the effects of psychological trauma longitudinally to better identify and distinguish resilient from more-vulnerable individuals.

The present study is unique because this is the only nationally based sample to ever include information about degree of exposure to the Nazi regime. Nevertheless, even though exposure to the Nazi regime has been used as a proxy for trauma in previous studies, variability of traumatic experiences associated with exposure to the Nazi regime and the subjective nature of trauma likely limit the ability to draw conclusions from this study. To overcome this problem, trauma severity was quantified as the number of Holocaust experiences, assuming that those who had been in more specific settings during the war, such as hiding or a concentration camp, also had greater trauma exposure. However, this solution is somewhat problematic. Furthermore, the database has no information about exposure to additional traumas during the life course or other life experiences other than the Holocaust. Thus, the study is limited to evaluating early-life exposure to a specific type of trauma and does not provide information about the effect of exposure to lifetime traumas or to a variety of traumas. In addition, although this study partially addressed the potential effect of religiosity on overall mortality, it was limited by evaluating frequency of religious attendance as a proxy of religiosity. Furthermore, only information about current religious affiliation and not about the religion one was raised in was available. Given that some Jews were raised as Christians during the war and converted back to

Judaism only after the war, this could be a potential confounder. Lastly, the comparison group of older Israelis most likely has also been consistently exposed to a variety of stressors and traumatic events throughout their lives because of the ongoing tension in the Middle East, the stress associated with immigration, and the indirect effects of the Holocaust on all Jewish people.

Despite these limitations, this is one of few studies ever to evaluate the relationship between exposure to the Nazi regime and late life mortality. The findings provide important information about resilience in older survivors and call for further research into the effect of trauma on mortality and morbidity in old age.

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