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Greater Age-Related Decline in Markers of Physical, Mental and Cognitive Health among Israeli Older Adults Exposed to Lifetime Cumulative Adversity

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Abstract

Objectives—This longitudinal investigation addressed whether and how lifetime cumulative adversity and depressive symptoms moderated age-related decline in markers of physical, mental and cognitive health.

Method—1,248 older adults (mean age = 62 at Wave 1) who completed the first two waves of the Israeli component of the Survey of Health, Ageing and Retirement in Europe (SHARE-Israel) reported on exposure to potentially traumatic life events, depressive symptoms, and three outcomes – disability, quality of life and cognitive markers.

Results—Age was related to greater functional decline in outcome measures across the two waves (i.e., increase in disability and decrease in quality of life and cognitive functioning). This age-related decline became stronger as lifetime adversity increased. A three-way interaction showed that the greatest age-related functional decline in outcome measures was especially salient among those with high level of lifetime adversity and high level of depressive symptoms.

Conclusion—Lifetime cumulative adversity is associated with a more noticeable process of age-related dysfunction across various markers of health. Although the majority of older adults are resilient to lifetime adversity, prevention and intervention programs should be aimed at mitigating the pronounced senescence observed when adversity accumulated to a large degree, and especially when it is accompanied with high level of distress.

Keywords

potentially traumatic life events; depressive symptoms; SHARE-Israel

Lifetime cumulative adversity refers to an accumulated exposure to a wide spectrum of potentially traumatic events (Turner & Lloyd, 1995). The notion of lifetime cumulative adversity, hereby titled lifetime adversity, acknowledges the frequent co-occurrence of adverse events, and the greater effect of multiple events on health, compared to that of a single event (Kessler, 1997; Seery, Holman, & Silver, 2010). Indeed, lifetime adversity has a detrimental effect on late-life physical (Krause, Shaw, & Cairney, 2004) and mental health (Shmotkin & Litwin, 2009). However, the bulk of research assessed the correlates of

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lifetime adversity at a single point in time. Therefore, its possible effect on the process of aging is relatively understudied. Research that address the relationship between lifetime adversity and deterioration over time can help to fill this evident void.

The aim of the current study, therefore, is to examine whether lifetime adversity predicts age-related decline in markers of physical, mental, and cognitive health. A related aim is to investigate the combined impact of exposure to potentially traumatic events and depressive symptoms. In order to address these aims, the study uses data from the first two waves of the Israeli component of Survey of Health, Ageing and Retirement in Europe (SHARE-Israel) (Litwin & Sapir, 2008), a national study of older Israelis.

Lifetime Adversity and Age-Related Decline in Health

The notion that lifetime adversity may increase age-related decline in health is proposed in the cumulative inequality theory (Ferraro & Shippee, 2009). This theory holds that personal exposure to risk adds to the effect of social systems (stratifying society according to class, race, income etc.) in generating inequality, which accumulates across the life span. Cumulative inequality interacts with one's ability to mobilize social, economic, and psychological resources, together with human agency (i.e., the ability to change one's environment) in shaping the individual's mode and level of functioning in old age. The theory further proposes that accumulated adversity may lead to biological changes that accelerate senescence. Some support to this notion can be found in the well-established link between stress and neuroendocrinological and immunological dysregulation (McEwen, 1998). When biological dysregulation extends over long periods of time, it brings about an earlier inception of disease and frailty (Miller, Chen, & Parker, 2011).

Very few works examined whether and how lifetime adversity is related to trajectories of late-life health over time. Using data from the Midlife Development in the United States study, Schafer and Ferraro (2012) found that childhood adversity is related to a higher chance of developing physical illness across two waves. Examining markers of mental health, Shrira (2012) showed a relationship between lifetime adversity and a higher chance of increase in depressive symptoms and a higher decrease in quality of life. As for cognitive functioning, one study (Comijs, ven den Kommer, Minnaar, Penninx, & Deeg, 2011) reported several negative life events to be related to steeper cognitive decline with age, even after controlling for depression. However, another study (Brown, 2010) did not find an accelerated cognitive decline as a function of negative childhood events.

The Moderating Role of Depressive Symptoms

The generally found moderate effect of lifetime adversity (Kraaij, Arensman, & Spinhoven, 2002; Krause et al., 2004) suggests that most older adults successfully cope with negative life events and maintain resilience (Ferraro & Shippee, 2009). Nevertheless, some people may be more susceptible than others to lifetime adversity, and it is important to know who is at higher risk for its detrimental effects. People suffering from high levels of mental distress may be in greater risk of deterioration following exposure to lifetime adversity.

Several studies support the above mentioned notion. Elder, Shanahan, and Clipp (1997), for example, found a positive effect of combat exposure on physical dysfunction among American veterans who reported low self-worth, but not among those who reported high self-worth. Similarly, the effects of lifetime adversity on mental health were exacerbated among those with a previous history of depression (Kessler & Magee, 1994; Maciejewski, Prigerson, & Mazure, 2000). However, in the cognitive domain, Brown (2010) found a greater effect on baseline cognition when childhood events were combined with a history of psychiatric problems, although she did not find this interaction to relate to a steeper age-related decline. Based upon these findings, the current study assumes that high mental distress, and more specifically, high level of depressive symptoms, moderates the relationship between lifetime adversity and age-related decline in health.

The Study Hypotheses

The current study examines the relationship between lifetime adversity and age-related decline in three markers of health, covering the three major domains of physical, mental and cognitive health: disability, quality of life and cognitive functioning. Based on the above mentioned literature, the study tests two main hypotheses. Hypothesis 1 holds that lifetime adversity moderates age-related decline in markers of health. More specifically, I hypothesize that age-related increase in disability, and decrease in quality of life and cognitive functioning, will be greater among those exposed to higher levels of lifetime adversity. Hypothesis 2 maintains that there will be a three-way interactive effect of age, lifetime adversity and depressive symptoms on markers of health. That is, when exposure to lifetime adversity is accompanied by a high level of depressive symptoms, the age-related increase in disability and decrease in quality of life and cognitive functioning will be the greatest.

Methods

Participants and Procedure

Data were drawn from the two first waves of the Israeli component of the Survey of Health, Ageing, and Retirement in Europe (SHARE-Israel), which presents a national sample of Israelis aged 50 or older and their spouses regardless of age, interviewed during 2005–2006 (Wave 1; W1) and again during 2009–2010 (Wave 2; W2). The design was based upon a probability sample of households within 150 representative statistical areas delineated by geographical and sociodemographic criteria. The total sample included 2,598 noninstitutionalized adults in 1771 households, out of whom 1,828 were interviewed again in W2 (70.4%). The data were collected by a comprehensive computer-assisted personal interview, which lasted about 90 minutes, and a supplementary paper Drop-Off questionnaire, which was returned later. Informed consent had been obtained from all respondents prior to the interview. SHARE-Israel received ethical approval by the Institutional Review Board of the Hebrew University of Jerusalem (for more on SHARE-Israel, see Litwin & Sapir, 2008).

As the queries regarding cumulative adversity were included in the Drop-Off questionnaire administered primarily in W1, the sample addressed in this study is limited to the 1,248

respondents who completed this questionnaire and participated in the two waves. Among these respondents the mean W1 age was 62.57 (*SD* = 9.70), 57.2% were women, 31.5% were Israeli-born Jews, 20.9% Jews born in the Middle-East or North Africa, 20.9% Jews born in Europe or America, 6.2% Jews born in the former Soviet Union, and 20.4% Israeli-born Arabs. The average education level was 2.96 (*SD* = 1.69) reflecting upper secondary education. As for marital status, 82.5% were married, 4.3% divorced, 1.6% never married and 11.6% were widowed. Finally, the average annual household income adjusted to the purchasing power parity (in Euro) was 23,941 (*SD* = 28,504).

An initial analysis comparing between respondents and non-respondents of the Drop-Off questionnaire did not find significant differences in gender, education, origin (dichotomized into non-Israeli-born vs. Israeli-born) and gross household income. However, Drop-Off respondents included a higher proportion of younger (below 60) and married respondents (Cramer's Φ = .05 and .06, respectively). When comparing these groups on W1 variables, Drop-Off respondents also had lower scores in ADL and depressive symptoms, and higher scores in the cognitive markers of time orientation, verbal fluency and arithmetic (Cohen's *d* ranged .08 to .19). However, these differences had a small effect size.

An additional attrition analysis comparing Drop-Off respondents who did not participate in W2 to those who did failed to find significant differences in gender, education and gross household income. However, Drop-Off respondents who participated in W2 included a higher proportion of younger respondents, married and Israeli-born respondents (Cramer's Φ ranged .06 to .09). When comparing these groups on W1 variables, those who participated in W2 also had lower scores in ADL and depressive symptoms, and higher scores in time orientation and verbal fluency (Cohen's *d* ranged .12 to .27). Nevertheless, these differences had a small effect size as well.

Measures

The main measures included lifetime cumulative adversity and depressive symptoms in W1 and the outcome measures in both waves.

Lifetime cumulative adversity was assessed by the Potentially Traumatic Events Inventory. Based on Breslau, Kessler, Chilicoat, Schultz, Davis, and Andreski's (1998) survey of lifetime traumatic events and pilot versions administered to older Israelis (more details in Keinan, Shrira, & Shmotkin, 2012), this inventory was adapted especially for the Drop-Off questionnaire in SHARE-Israel (Shmotkin & Litwin, 2009). The final inventory eventually consisted of 17 difficult life events, which included bereavement-related events (e.g., experiencing the death of a spouse), life hardships (e.g., providing long term care to a disabled relative), health vulnerabilities (e.g., being at a risk of death due to illness or accident), war- and terrorism-related events (e.g., being wounded in war), and other victimizations (e.g., being the victim of crime). Some of these events go beyond those that meet the DSM-IV-TR (American Psychiatric Association, 2000) definition of traumatic events. This approach is in congruity with a growing literature suggesting that the type of events causing posttraumatic symptoms is broader than what the current diagnostic criteria indicate (Lloyd & Turner, 2003; Robinson & Larson, 2010). Respondents were asked to check whether each of the 17 events had ever happened to them. If confirming the

experience of an event, respondents were further asked to specify their age when the event had first taken place, and to rate the impact of the event on their life as either “little” (1), “moderate” (2), or “great” (3). As one of the outcome measures included physical disability, two events reflecting health vulnerabilities (being at risk of death due to illness or serious accident, and being in need for long term care due to difficulty in caring for oneself) were omitted, leaving 15 events. In order to calculate overall cumulative adversity, a minimum of completion (checking yes/no) of 80% of the events was required for scoring a sum, with scores of 12–14 items being interpolated (possible range 0–15).

Depressive symptoms were assessed by the European Depression scale (Euro-D; Prince et al., 1999). This scale contains 12 items that specify recent depressive symptoms (e.g., “In the last month, have you cried at all?”), scored as a sum of “no” (0) and “yes” (1, indicating presence of a symptom) encoded answers. Five items were phrased in positive terms (e.g., “do you keep up your interests?”). In the present analysis, a minimum of completion of 10 items was required for scoring a sum, with scores of 10–11 items being interpolated. Cronbach’s α for the Euro-D in the current study was .73.

Disability was measured by counting difficulties in basic and instrumental activities of daily living (adapted from Katz, Downs, Cash, & Grotz, 1970, and Lawton & Brody, 1969). This measure included 13 functions: dressing, crossing a small room, bathing, getting in or out of bed, eating, toileting, using a map, preparing meals, daily shopping, using the telephone, taking medications, doing housework, and handling personal finances. Difficulties in all of the functions were rated with a dichotomized answer (*not having difficulties*/*having difficulties*). Internal reliability measured by Kuder-Richardson’s ρ was .87 and .90 at W1 and W2, respectively.

Quality of life was measured by 12 items originating from the CASP-19 (CASP-12; Hyde, Wiggins, & Blane, 2003; Sim, Bartlam, & Bernard, 2011). This measure conceptualizes quality of life in terms of need satisfaction in four domains: having a sense of control, autonomy, self-realization, and pleasure. Control is defined as the ability to actively intervene in one’s environment. Autonomy is defined as the ability of an individual to be free from the unwanted interference of others. Self-realization and pleasure capture the active and reflexive processes of self-fulfillment. The items are rated on a scale ranging from “never” (1) to “often” (4). In the present analysis, a minimum of completion of 10 items was required for scoring a sum, with scores of 10–11 items being interpolated. Internal reliability measured by Cronbach’s α was .81 and .82 at W1 and W2, respectively.

Cognitive functioning was measured by three markers – time orientation, verbal fluency and arithmetic. Time orientation was the sum of accurate responses participants gave in request to name the current year, month, day of the month and day of the week. Word fluency was the sum of correct names of animals participants could think about within a one-minute trial. Respondents whose score fell more than 3 standard deviations above the mean group score (e.g., greater than 40) were given a score of 40. Arithmetic was the sum of correct answers participants gave to four arithmetic questions. Following Shrira, Palgi, Ben-Ezra, Spalter, Kavé, and Shmotkin (2011), a composite score of these three cognitive measures was calculated. First, the scores in each domain were standardized and then the standardized

scores were summed to a composite score, with a higher score representing better cognitive functioning. Verbal recall, also available in SHARE, was not used, because respondents showed an average improvement in this marker across the two waves, most plausibly reflecting a practice effect.

Background characteristics in W1 included age, gender, geographic origin (Israeli-born Jews, Jews born in the Middle-East or North Africa, Jews born in Europe or America, Jews born in the former Soviet Union, and Israeli-born Arabs), and marital status. Education was recorded by one of seven education levels according to the International Standard Classification of Educational Degrees (ISCED-97; UNESCO, 1997). Income was indicated by the annual household income adjusted to the purchasing power parity (in Euro).

Data Analysis

In order to test the study hypotheses, I performed a series of multiple hierarchical regression analyses. The regressions predicted W2 outcomes after controlling for their baseline level in W1. Therefore, the analyses actually predicted the between-wave change in the outcome measures, wherein the age coefficient reflected the age-related effect on between-wave change, and the interactions between age with lifetime adversity and depressive symptoms reflected the moderating effect of these variables on the age-related effect.

In order to test Hypothesis 1, W2 outcome measures were regressed on the baseline level of the outcome measures in W1 in Step 1, and the background characteristics of gender, origin, education, marital status, and income in Step 2. These characteristics were controlled for as they were found related either to lifetime adversity or to the outcome measures (Keinan et al., 2012). Age was added in Step 3, lifetime adversity in Step 4, and the interaction between age and lifetime adversity in Step 5.

In order to test Hypothesis 2, W2 outcome measures were regressed on the aforementioned Step 1–3 variables. Lifetime adversity and depressive symptoms were added in Step 4, the three possible two-way interactions between age, lifetime adversity and depressive symptoms were added in Step 5, and the three-way interaction between age, lifetime adversity and depressive symptoms was added in Step 6.

All continuous variables, except the cognitive composite score, were mean-centered before entering them into the analyses. Significant interactions were probed and plotted using the PROCESS computational tool (Hayes, 2013).

Results

Descriptive Statistics of Lifetime Adversity

Some two thirds of respondents (n = 931) reported having experienced at least one potentially traumatic life event during their lifetime, the average being 1.97 events (SD = 1.93). Table 1 presents the number of respondents who reported the occurrence of each of the 15 difficult events.

As can be seen, the most frequently mentioned events included life hardships, like having a loved one at risk of death due to illness or accident, and providing long term care to a disabled or impaired relative. The least frequently mentioned events included victimizations, such as being a victim of violence or abuse, and experiencing sexual assault.

Table 2 presents the descriptive statistics for the other study variables and their correlations with lifetime adversity, separately for those with low and high level of depressive symptoms. Depressive symptoms were dichotomized at the optimal Euro-D cut-off point for predicting a diagnosis of depression in semi-structured clinical interviews (Prince et al., 1999), 0–3 symptoms and 4 symptoms or above.

As can be seen, lifetime adversity correlated with the health markers mainly in the high level depressive symptoms group. There, lifetime adversity was related to higher disability, lower quality of life and lower cognitive functioning. Among those with low level of depressive symptoms, lifetime adversity was negatively related to disability and was unrelated to quality of life and cognitive functioning. Generally, lifetime adversity showed similar correlations with the background characteristics among those with low and high level of depressive symptoms. Lifetime adversity was related to higher age and was negatively related to marital status (lower lifetime adversity among married respondents).

Main Regression Analyses

Table 3 presents the regression coefficients for the three first regressions examining Hypothesis 1.

After controlling for the baseline level of disability and background characteristics, age was positively related to W2 disability. This means that the higher the respondent's age at W1, the greater the between-wave increase in disability. There was also a significant interaction between age and lifetime adversity which can be seen in Figure 1a.

The figure shows that compared to those with lifetime adversity 1 *SD* below the mean, the positive relationship between age and disability was stronger among those with lifetime adversity 1 *SD* above the mean. When predicting quality of life and cognitive functioning, similar results emerged. Age was significantly related to greater between-wave decrease in quality of life and cognitive functioning, and there were significant interactions between age and lifetime adversity. These interactions presented in Figure 1b–1c shows that compared to those with lifetime adversity 1 *SD* below the mean, the negative relationship between age and quality of life and cognitive functioning was stronger among those with lifetime adversity 1 *SD* above the mean. Noticeably, the interactions between age and lifetime adversity remained significant, even after adding depressive symptoms to the covariates (B = 0.007, p = .023, B = −0.02, p = .017, and B = −0.002, p = .037 for disability, quality of life, and cognitive functioning, respectively)

Table 4 presents the regression coefficients for the three regressions examining Hypothesis 2.

After controlling for the baseline level of disability, background characteristics, the main effects of age, lifetime adversity, and depressive symptoms, and their three two-way interactions, the three-way interaction between age, lifetime adversity, and depressive symptoms was significant. Figure 2a presents the significant three-way interaction.

As can be seen, the positive relationship between age and disability was the most strong among those whose lifetime adversity and depressive symptoms were both 1 *SD* above the mean. When predicting quality of life and cognitive functioning, similar significant three-way interactions emerged. These interactions presented in Figure 2b–2c shows that the negative relationship between age and quality of life and cognitive functioning was the most strong among respondents whose lifetime adversity and depressive symptoms were both 1 *SD* above the mean.

Supplementary Analyses

Following the main findings, it was of interest to examine which events were related to greater age-related decline in the health markers. Therefore, in additional exploratory analyses the potentially traumatic events were divided according to their types: bereavement, life hardship and health vulnerability, war and terrorism, and victimization (see Table 1). As some types included more potential events than others, exposure in each type was dichotomized to no exposure (0) or exposure to one or more events (1). The health markers were regressed in the same way as in the main analyses, examining together all the main effects of the four event types and their interactions with age.

For disability, war and terror and life hardship and health vulnerability has a main effect ($\beta = 0.05$, $p = .036$, and $\beta = -0.06$, $p = .007$, respectively), and only the interaction between age and war and terror was significant ($B = 0.03$, $p = .024$). For quality of life and cognitive functioning, only the interaction between age and war and terror was significant ($B = -0.08$, $p = .035$, and $B = -0.01$, $p = .007$). The interaction coefficients reflected a stronger relationship between age and between-wave decline in health markers among those exposed to one or more events of war and terror.

Discussion

This study examined age-related decline in three markers of health – disability, quality of life and cognitive functioning – and whether lifetime adversity and depressive symptoms moderated this decline. Age was related to a greater increase in disability and to a greater decrease in quality of life and cognitive functioning with time. Moreover, corroborating Hypothesis 1, this age-related effect was particularly strong among those with high level of lifetime adversity. Finally, supporting Hypothesis 2, there was a three-way interaction between age, lifetime adversity and depressive symptoms on health decline with time, so that the age-related decline in the three health markers was the strongest among those with high level of lifetime adversity combined with high level of depressive symptoms. I now turn to discuss the findings in more detail.

Confirming Hypothesis 1, respondents with high level of lifetime adversity showed a stronger age effect on between-wave increase in disability and decrease in cognitive

functioning. Actually, while those with high level of lifetime adversity showed a marked effect of age on decrease in quality of life, those with low level of lifetime adversity showed almost no change in quality of life. The current findings join previous studies delineating greater decrease in physical (Schafer & Ferraro, 2012), mental (Shrira, 2012) and cognitive (Comijs et al., 2011) markers of health. Among other factors, depressive and posttraumatic symptoms may intervene in the relationship between lifetime adversity and age-related decline. Indeed, greater age-related dysfunction, especially in cognition, was observed among older adults suffering from posttraumatic symptoms (Lapp, Agbokou, & Ferreri, 2011). One study even found that veterans suffering from posttraumatic distress perceived themselves to be older than their actual age (Solomon, Helvitz, & Zerach, 2009). Still, the current findings indicate that the greater age effect among those with high lifetime adversity remained significant even after controlling for depressive symptoms, indicating that the effect of exposure is independent of that of depression. Relatedly, a recent study on older Germans found that lifetime exposure to traumatic events was related with an increased rate of somatoform disorders, even in the absence of posttraumatic disorder (Glaesmer, Kaiser, Braehler, Freyberger, & Kuwert, 2012). Moreover, Lin, Epel, and Brody (2012) note that even in the absence of a clinical level of mental distress, childhood adversity is associated with an important marker of cellular aging, namely shortened DNA-protein complexes, called telomeres. The combined evidence suggest that exposure to adversity in itself has an effect on biological systems, mostly producing hormonal dysregulation and pro-inflammatory tendencies in the immune system (Miller et al., 2011).

Supporting Hypothesis 2, respondents with a combination of both high lifetime adversity and high depressive symptoms showed the greatest age effect on between-wave decline in the health markers. These findings add to previous reports on the moderating effect of mental distress in the relationship between adversity and physical (Elder et al., 1997), as well as mental, health (Kessler & Magee, 1994; Maciejewski et al., 2000). These findings correspond with the assumptions of the cumulative inequality theory (Ferraro & Shippee, 2009), according to which cumulative adversity shapes the aging process, but one’s ability to mobilize resources and one’s agency mitigate the noxious influence of inequality.

The findings from the supplementary analyses should be mentioned as well. Here, it was found that exposure to war and terrorism was related to an increase effect of age on between-wave decline. This finding corresponds with other works documenting the effects of war (Kimhi, Hantman, Goroshit, Eshel, & Zysberg, 2012) and terrorism (Bleich, Gelkopf, Melamed, & Solomon, 2005) on older adults, but further shows that such an exposure is not only related to decreased health at one point in time, but also to a greater age-related deterioration. Physical injuries, caused by war or terrorist attacks, are not likely to explain the entire effect, as they were reported by very few respondents, and the interaction between war and terror and age appeared across all three markers of health, including quality of life and cognition. In any case, this finding should be interpreted with caution, as exposure to war and terror is endured by Israelis to a large extent, and there is a need for replication in other cultures. Moreover, the fact that other types of events did not interact with age does not mean that specific events embodied within these types did not interact with age. It is quite possible that the effect of some events is masked by others that have a much smaller

effect, or even an opposite effect. In this study, it is hard to determine the relative effect of specific events, as the number of respondents exposed to certain events was small.

When interpreting the current findings one should account for the possibility that lifetime adversity and health markers may have reciprocal influences. Lifetime adversity may bring to a decline in health markers, but declined health can elicit or exacerbate certain stressful events and difficulties. Moreover, certain predispositions, such as early social circumstances, genetic liability, aspects of personality or access to social support, may render people prone to both lifetime adversity and decline in health. The possible causal paths between lifetime adversity and age-related decline in health should be further examined.

The current findings should be assessed in light of the study limitations and strengths. One limitation of the current study is the availability of two waves. With two measurement occasions, it is hard to confirm whether change represents a constant process. An investigation of change will become possible when more data points become available in SHARE-Israel. Moreover, as the current sample was confined to the respondents of the Drop-Off questionnaire, who completed the two waves, it lost some of the representativeness of the full SHARE-Israel sample. However, analyses comparing those who completed the Drop-Off to those who did not, as well as additional attrition analyses, found negligible to small differences. Finally, the present study did not address posttraumatic distress, which is often considered a relevant outcome in studies of lifetime adversity. Still, the advantage in using depressive symptoms in research is in their applicability to large community populations, as well as their sensitivity to both clinical and subclinical conditions (Blazer & Hybels, 2005).

Compensating for the above mentioned limitations are several of the study's strengths. First, the study offers a longitudinal examination of a large heterogeneous sample, drawn in a national survey. Second, recall bias in retrospective reports of lifetime adversity (cf. Hardt & Rutter, 2004) was partially mitigated in the current design as reports on lifetime adversity were made at a different time point than self-evaluations of the outcome measures.

In conclusion, this study shows that lifetime cumulative adversity is associated with a more noticeable process of age-related dysfunction across three major markers of health. Although the majority of older adults show resilience following adversity, prevention and intervention programs should tackle the pronounced age-related dysfunction observed among those exposed to greater lifetime adversity, especially when they also suffer from high level of depressive symptoms.

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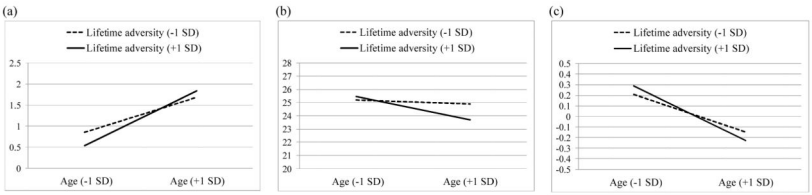

Figure 1.

The two-way interactions between age and lifetime adversity when predicting W2 health outcomes: (a) disability; (b) quality of life; (c) cognitive functioning

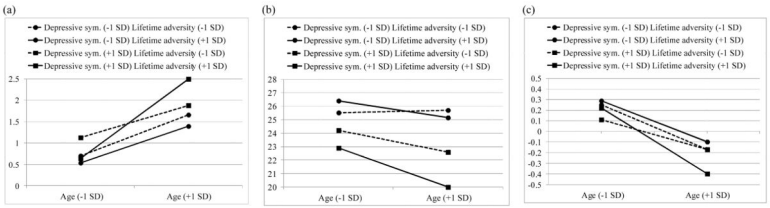

Figure 2.

The three-way interactions between age, lifetime adversity, and depressive symptoms when predicting W2 health outcomes: (a) disability; (b) quality of life; (c) cognitive functioning

Table 1

Occurrence of Potentially Traumatic Events

	N	%
Bereavement		
Experienced the death of a spouse	159	12.8
Experienced the death of a child or grandchild	136	10.9
Life hardship and heath vulnerability		
Had a loved one at risk of death due to illness or accident	471	38.0
Experienced extremely severe economic deprivation	278	22.4
Provided long term care to a disabled or impaired relative	445	35.9
War and terrorism		
Lost a loved one in a war or in military service	259	20.8
Witnessed the serious injury or the death of someone in war or military action	185	14.9
Experienced the injury or the death of a loved one in a terrorist act	90	7.2
Was wounded in war or military action	66	5.3
Witnessed a terrorist act in which she/he was not harmed personally	64	5.1
Was wounded in a terrorist act (an attack by terrorists against civilians)	14	1.1
Victimization		
Was the victim of crime (such as robbery or fraud)	117	9.4
Witnessed an accident or violent act in which someone was seriously injured or killed	116	9.3
Was the victim of violence or abuse	35	2.8
Experienced sexual assault (rape or harassment)	26	2.1

Note. N = 1,248.

Table 2

Descriptive Statistics for the Study Variables

	Low level of depressive symptoms			High level of depressive symptoms		
	M/%	***SD***	**Correlation with lifetime adversity**	***M/%***	***SD***	**Correlation with lifetime adversity**
Lifetime adversity	1.92	1.92	-	2.08	1.95	-
Disability	0.74	1.77	−0.07*	2.42	3.50	0.14**
Quality of life	26.22	5.46	0.04	20.82	6.80	−0.13*
Cognitive functioning	0.18	0.71	0.02	−0.35	0.96	−0.10*
Age	61.80	9.49	0.16***	64.33	9.97	0.20***
Gender (women)	53.0	−	−0.08*	66.9	-	−0.02
Origin (non-Israeli-born)	65.3	-	0.08*	76.1	-	0.08
Education	3.21	1.66	0.07*	2.38	1.62	0.08
Marital status (married)	83.9	-	−0.19***	76.9	-	−0.24***
Household income	26,132	31,486	0.03	18,879	18,968	−0.00

Note. n = 874 and 372 for low and high level of depressive symptoms, respectively. Health markers refer to W2; lifetime adversity and background characteristics refer to W1. Correlation values represent Pearson coefficients except for coefficients for gender, origin, and marital status that represent point-biserial coefficients and those for education that represent Spearman's rank coefficients.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

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Table 3

Regression Analyses Predicting W2 Health Markers by Age, Lifetime adversity and their Interaction

	Disability		Quality of life		Cognitive functioning	
	B	**β**	***B***	**β**	***B***	**β**
Step 1 (ΔR^2)	0.363***		0.248***		0.358***	
Baseline level of marker[a]	0.91	0.60***	0.50	0.49***	0.65	0.59***
Step 2 (ΔR^2)	0.033***		0.072***		0.068***	
Gender[b]	−0.10	−0.02	0.11	0.01	−0.02	−0.01
Origin: Mid-East/North Africa[c]	0.19	0.03	−1.14	−0.07*	−0.07	−0.03
Origin: Europe/America[c]	0.21	0.03	−0.66	−0.04	−0.05	−0.02
Origin: former Soviet Union[c]	0.81	0.05*	−3.01	−0.07**	−0.48	−0.09***
Origin: Israeli Arabs[c]	0.69	0.10***	0.26	0.52	0.15	0.07*
Education	−0.16	−0.11***	0.79	0.21***	0.12	0.25***
Marital status[d]	−0.28	−0.01	2.02	0.11***	0.16	0.07**
Household income	−0.00	−0.01	0.00	0.06*	0.00	0.05*
Step 3 (ΔR^2)	0.032***		0.006**		0.054***	
Age	0.05	0.20***	−0.06	−0.08**	−0.02	−0.26***
Step 4 (ΔR^2)	0.000		0.002		0.000	
Lifetime adversity	−0.01	−0.01	−0.14	−0.04	−0.00	−0.00
Step 5 (ΔR^2)	0.002*		0.003*		0.002*	
Age X Lifetime adversity	0.01	0.04*	−0.02	−0.06*	−0.00	−0.05*
R^2	0.430***		0.331***		0.483***	

Note. N ranged 1,116 to 1,234.

[a] Baseline level of marker refers to the outcome in W1.

[b] Coded 1 = man, 2 = woman.

[c] The dummy variables of origin are contrasted with Israeli-born.

[d] Coded 1 = currently unmarried, 2 = married.

* $p < .05$,
** $p < .01$,
*** $p < .001$.

Table 4

Regression Analyses Predicting W2 Health Markers by Age, Lifetime adversity, Depressive Symptoms and their Interactions

	Disability		Quality of life		Cognitive functioning	
	B	**β**	***B***	**β**	***B***	**β**
Step 4 (ΔR^2)	0.009***		0.059***		0.012***	
Lifetime adversity	−0.01	−0.01	−0.06	−0.02	0.00	0.00
Depressive symptoms	0.11	0.11***	−0.76	−0.27***	−0.04	−0.12***
Step 5 (ΔR^2)	0.004*		0.005*		0.005**	
Age X Lifetime adversity	0.00	0.04	−0.01	−0.04*	−0.00	−0.03
Age X Depressive symptoms	0.00	0.04	−0.01	−0.04	−0.00	−0.03
Lifetime adversity X Depressive symptoms	0.00	0.01	−0.01	−0.01	−0.00	−0.03
Step 6 (ΔR^2)	0.004**		0.003*		0.002*	
Age X Lifetime adversity X Depressive symptoms	0.00	0.12**	−0.01	−0.11*	−0.00	−0.08*
R^2	0.454***		0.385***		0.499***	

Note. N ranged 1,115 to 1,232. Step 1, 2, and 3 included the baseline level of the marker, background characteristics (gender, origin, education, marital status and household income) and age, respectively.

* $p < .05$,

** $p < .01$,

*** $p < .001$.

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