

Supplementary Online Content

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eMethods

eTable 1. Descriptive Information of MIDUS Sample

eTable 2. Results of Models Predicting Adult All-Cause Mortality from the Experience of Severe Childhood Physical Abuse in Men

eTable 3. Results of Models Predicting Adult All-Cause Mortality from the Experience of Moderate Childhood Physical Abuse in Men

eTable 4. Results of Models Predicting Adult All-Cause Mortality from the Experience of Childhood Emotional Abuse in Men

eTable 5. Results of Models Predicting Adult All-Cause Mortality from Accumulation of Types of Childhood Abuse in Men

eReferences

This supplementary material has been provided by the authors to give readers additional information about their work.

ONLINE SUPPLEMENT

METHOD

Participants

Data for this study come from the National Survey of Midlife Development in the United States (MIDUS¹). MIDUS is a national sample of non-institutionalized, English speaking adults from the 48 contiguous states selected via random-digit telephone dialing. 7,108 adults (25-74 years old), participated in a telephone interview, MIDUS I, conducted from 1995-1996. Of these, 6,325 participants completed the subsequent mail-in questionnaires at MIDUS I. Mortality data was then collected through October of 2015. IRB approval for the 1995-1996 data collection was obtained from Harvard Medical School. Interviewers from a professional survey firm (DataStat, Ann Arbor, MI) identified potential participants and obtained informed consent by phone. Mortality follow-up was completed at later waves of MIDUS data collection, after the study had moved to University of Wisconsin, Madison. The later waves, including the National Death Index searches, were approved by the IRB of the University of Wisconsin. The current study utilizes data from 6,285 participants who both completed the abuse questionnaire and had survival time data available.

Measures

All measures below were from the mail-in questionnaires.

Childhood abuse. Child abuse questions came from a revised version of the Conflict Tactics Scale^{2,3}. These questions divided abuse into three categories: emotional abuse, moderate physical abuse, and severe physical abuse^{4,5}. Emotional abuse included whether someone “insulted or swore at you/sulked or refused to talk to you/stomped out

of the room/did or said something to spite you/threatened to hit you/smashed or kicked something in anger.” Moderate physical abuse included whether someone “pushed, grabbed or shoved you/slapped you/threw something at you.” Severe physical abuse included whether someone “kicked, bit, or hit you with a fist/hit or tried to hit you with something/beat you up/choked you/burned or scalded you.” MIDUS used a single question to probe each of the above types of abuse. All questions were asked with respect to the participant’s childhood, and participants responded on a scale including never/rarely/sometimes/often. Consistent with previous studies, we focused on abuse from participants’ mother or father⁵⁻¹⁰. There were separate probes for each parent. Thus in total, there were 6 probes (3 abuse items about mother, 3 abuse items about father). We coded abuse as present if it happened frequently, that is, when the participant endorsed one of the above items as happening either sometimes or often during childhood. This is consistent with approaches used in previous studies^{5, 8, 10}. Abuse was coded as present or absent for each of the three types of abuse (emotional, moderate physical, severe physical).

In addition, the accumulation of types of abuse was coded by summing the number of abuses that were present during childhood, consistent with approaches in previous research^{10, 11}. This variable was coded as none (no abuse reported), some (1-2 types of abuse reported), or all (emotional, moderate physical, and severe physical abuse all reported).

All-cause mortality data. By the censor date of October 31, 2015 there were a total of 1,299 (16.87%) confirmed deaths in the MIDUS Study. Mortality data on participants was obtained using several methods. First, there were three National Death

Index reports conducted in 2006 and 2009 which confirmed 569 participant deaths. Second, 483 deaths were recorded during the tracing/closeout phases after fielding MIDUS 2 (2005-06) and MIDUS 3 (2013-15). Lastly, 94 deaths were recorded as normal longitudinal sample maintenance was conducted. When deaths were recorded during tracing/closeout or longitudinal maintenance, the University of Wisconsin Survey Center confirmed deaths and their dates via National Death Index mortality tracing. For purposes of confidentiality, only the month and year of death were recorded so the exact date of death could not be used to identify participants. Thus, the 15th day of each month was set as the day for all deaths.

Of the 6,285 participants included in these analyses, 1,091 (17.4%) were deceased. Survival time for decedents was the interval (in years) from the date when MIDUS I self-administered questionnaires were returned to the study team (1995-96) to the date of their death. Participants that were still alive (censored observations) had survival times that equaled the length of the follow-up (censored at 10/31/2015).

Alternative Explanations

Childhood socioeconomic status (SES). Childhood SES was probed by asking participants about their parents' highest educational degree. This variable was coded as either both parents having less than a high school diploma (0) or one or more parent having a high school diploma or higher (1).

Personality. Personality traits were assessed using Big Five markers^{12, 13}. We focused on Neuroticism and Conscientiousness as potential alternative explanations for study findings, as these two personality traits are most strongly associated with mortality and health¹⁴⁻¹⁶. Respondents were asked how much each of the following adjectives

described them on a scale ranging from 1 (not at all) to 4 (a lot): neuroticism (moody, worrying, nervous, calm, □ Respondents were asked how much each of the following adjectives described them on a scale ranging from 0 to 4 as needed, and scores were averaged, with higher scores indicating higher levels of that trait.

Depression. The presence of major depression in the previous 12 months was coded based on the definition and criteria specified in the American Psychiatric Association's Diagnostic and Statistical Manual of mental disorders using screening questions on depressed mood, anhedonia, and associated symptoms from the World Health Organization's Composite International Diagnostic Interview¹⁷⁻¹⁹. Depression was coded as present or absent (1/0).

Covariates.

Covariates included participants' age, race (coded as dummy variables reflecting the two primary racial groups, European (yes/no) and African American (yes/no)), current SES (educational attainment, coded as less than high school diploma; graduation from high school or its equivalent; some college; bachelor's degree or higher); history of major chronic diseases, including cancer (yes/no) and heart disease (yes/no, including any of the following: myocardial infarction, heart failure, or other diagnosed heart condition); and health behaviors (current regular smoker, yes/no; and regular alcohol use, whether there was a time when they drank 3+ days per week, yes/no).

eTable 1. Descriptive information of MIDUS sample

	Women (N=3,298)			Men (N=2,987)			t	□D	p
	%	M	SD	%	M	SD			
Age		47.0 2	13.0 6		46.7 6	12.8 2	0.7 9		.43
Ethnicity								11.74	.003
European American	90.0			91.6					
African American	6.1			4.1					
Other	3.9			4.3					
Current SES (Education)								83.22	<.001
<High school	9.4			8.3					
High school	31.6			26.0					
Some college	32.1			28.3					
≥University degree	26.8			37.5					
Childhood SES									
Parents with <high school degree	29.9			24.4				22.30	<.001
Heart disease	5.0			7.5				16.37	<.001
Cancer	8.9			5.4				28.51	<.001
Alcohol use	28.0			56.6				527.42	<.001
Smoking	21.6			22.0				0.15	.70
Neuroticism		2.30	0.67		2.16	0.65	8.37		<.001
Conscientiousness		3.47	0.43		3.37	0.44	8.88		<.001
Depression	14.9			10.0				35.22	<.001
Abuse									
Emotional	36.2			35.7				0.16	.69
Moderate physical	25.3			27.5				3.76	.05

Severe physical	10.7			12.5				4.87	.03
Mortality N=number dead	15.6 N=51 5			19.3 N=57 6				14.70	<.00 1
Years of Survival		18.9 3	4.02		18.6 0	4.30	3.1 2		.002

eTable 2. Results of Models Predicting Adult All-Cause Mortality from the Experience of Severe Childhood Physical Abuse in Men

		Model 1		Model 2		Model 3
Predictor	HR	[CI]	HR	[CI]	HR	[CI]
Age	1.097 ^c	[1.088, 1.105]	1.089 ^c	[1.080, 1.098]	1.100 ^c	[1.091, 1.110]
Race						
Caucasian	0.875	[0.511, 1.498]	0.833	[0.486, 1.428]	0.824	[0.480, 1.414]
Afr Amer	1.179	[0.619, 2.242]	1.179	[0.618, 2.249]	1.125	[0.589, 2.149]
Education	0.803 ^c	[0.741, 0.870]	0.801 ^c	[0.738, 0.868]	0.847 ^c	[0.780, 0.920]
Heart disease			2.250 ^c	[1.830, 2.767]	2.270 ^c	[1.845, 2.793]
Cancer			1.113	[0.853, 1.451]	1.128	[0.864, 1.471]
Alcohol use					1.203 ^a	[1.010, 1.432]
Smoking					2.652 ^c	[2.176, 3.231]
Abuse	1.088	[0.850, 1.393]	1.020	[0.796, 1.308]	0.935	[0.728, 1.200]

Note: ^ap<.05. ^bp<.01. ^cp<.001.

eTable 3. Results of Models Predicting Adult All-Cause Mortality from the Experience of Moderate Childhood Physical Abuse in Men

Predictor	Model 1		Model 2		Model 3	
	HR	[CI]	HR	[CI]	HR	[CI]
Age	1.096 ^c	[1.088, 1.105]	1.088 ^c	[1.080, 1.097]	1.100 ^c	[1.091, 1.110]
Race						
Caucasian	0.859	[0.503, 1.466]	0.828	[0.484, 1.417]	0.824	[0.482, 1.409]
Afr Amer	1.154	[0.608, 2.189]	1.172	[0.616, 2.231]	1.128	[0.592, 2.147]
Education	0.796 ^c	[0.734, 0.864]	0.796 ^c	[0.733, 0.863]	0.842 ^c	[0.775, 0.915]
Heart disease			2.216 ^c	[1.802, 2.726]	2.227 ^c	[1.809, 2.742]
Cancer			1.128	[0.863, 1.475]	1.155	[0.882, 1.512]
Alcohol use					1.186	[0.996, 1.414]
Smoking					2.701 ^c	[2.216, 3.291]
Abuse	0.987	[0.818, 1.191]	0.968	[0.801, 1.168]	0.888	[0.734, 1.074]

Note: ^ap<.05. ^bp<.01. ^cp<.001.

eTable 4. Results of Models Predicting Adult All-Cause Mortality from the Experience of Childhood Emotional Abuse in Men

Predictor	Model 1		Model 2		Model 3	
	HR	[CI]	HR	[CI]	HR	[CI]
Age	1.096 ^c	[1.087, 1.104]	1.088 ^c	[1.079, 1.097]	1.099 ^c	[1.090, 1.109]
Race						
Caucasian	0.850	[0.498, 1.453]	0.820	[0.479, 1.403]	0.817	[0.478, 1.398]
Afr Amer	1.151	[0.606, 2.184]	1.174	[0.617, 2.232]	1.136	[0.597, 2.161]
Education	0.794 ^c	[0.732, 0.861]	0.795 ^c	[0.733, 0.862]	0.844 ^c	[0.778, 0.917]
Heart disease			2.246 ^c	[1.826, 2.762]	2.252 ^c	[1.830, 2.772]
Cancer			1.132	[0.867, 1.480]	1.153	[0.882, 1.508]
Alcohol use					1.192	[1.000, 1.420]
Smoking					2.714 ^c	[2.227, 3.307]
Abuse	0.920	[0.764, 1.107]	0.912	[0.758, 1.098]	0.850	[0.705, 1.025]

Note: ^ap<.05. ^bp<.01. ^cp<.001.

eTable 5. Results of Models Predicting Adult All-Cause Mortality from Accumulation of Types of Childhood Abuse in Men

Predictor	Model 1		Model 2		Model 3	
	HR	[CI]	HR	[CI]	HR	[CI]
Age	1.096 ^c	[1.088, 1.105]	1.088 ^c	[1.079, 1.097]	1.100 ^c	[1.090, 1.109]
Race						
Caucasian	0.872	[0.510, 1.492]	0.839	[0.490, 1.438]	0.836	[0.487, 1.434]
Afr Amer	1.170	[0.616, 2.223]	1.193	[0.626, 2.274]	1.141	[0.598, 2.178]
Education	0.798 ^c	[0.736, 0.865]	0.797 ^c	[0.735, 0.865]	0.843 ^c	[0.776, 0.915]
Heart disease			2.232 ^c	[1.817, 2.742]	2.235 ^c	[1.818, 2.747]
Cancer			1.128	[0.864, 1.471]	1.149	[0.880, 1.501]
Alcohol use					1.202 ^a	[1.009, 1.432]
Smoking					2.683 ^c	[2.201, 3.269]
Types of abuse						
Some v. none	0.886	[0.732, 1.072]	0.874	[0.722, 1.059]	0.830	[0.685, 1.006]
All v. none	1.081	[0.817, 1.429]	1.047	[0.791, 1.384]	0.914	[0.688, 1.213]

Note: ^ap<.05. ^bp<.01. ^cp<.001.

References

1. Brim J,O.G., Ryff CD, Kessler RC. *How healthy are we? A national study of well-being at midlife*. Chicago, IL: University of Chicago Press; 2004.
2. Straus MA, Hamby SL, Boney-McCoy S, Sugarman DB. The Revised Conflict Tactics Scale (CTS2): Development and preliminary psychometric data. *Journal of Family Issues*. 1996;17 283-316.
3. Straus MA. Measuring intrafamily conflict and violence: The Conflict Tactics (CT) Scales. *Journal of Marriage and Family*. 1979;41 75-88.
4. Rich-Edwards JW, Spiegelman D, Lividoti Hibert EN et al. Abuse in childhood and adolescence as a predictor of type 2 diabetes in adult women. *Am J Prev Med*. 2010;39 (6):529-536.
5. Irving SM, Ferraro KF. Reports of abusive experiences during childhood and adult health ratings: personal control as a pathway. *J Aging Health*. 2006;18 (3):458-485.
6. Goodwin RD, Hoven CW, Murison R, Hotopf M. Association between childhood physical abuse and gastrointestinal disorders and migraine in adulthood. *Am J Public Health*. 2003;93 (7):1065-1067.
7. Goodwin RD, Wamboldt FS. Childhood physical abuse and respiratory disease in the community: the role of mental health and cigarette smoking. *Nicotine Tob Res*. 2012;14 (1):91-97.
8. Greenfield EA, Marks NF. Profiles of physical and psychological violence in childhood as a risk factor for poorer adult health: evidence from the 1995-2005 National Survey of Midlife in the United States. *J Aging Health*. 2009;21 (7):943-966.
9. Pitzer LM, Fingerman KL. Psychosocial resources and associations between childhood physical abuse and adult well-being. *J Gerontol B Psychol Sci Soc Sci*. 2010;65 (4):425-433.
10. Greenfield EA, Marks NF. Identifying experiences of physical and psychological violence in childhood that jeopardize mental health in adulthood. *Child Abuse Negl*. 2010;34 (3):161-171.
11. Lee C, Tsenkova V, Carr D. Childhood trauma and metabolic syndrome in men and women. *Soc Sci Med*. 2014;105 122-130.
12. Prenda KM, Lachman ME. Planning for the future: a life management strategy for increasing control and life satisfaction in adulthood. *Psychol Aging*. 2001;16 (2):206-216.
13. Mroczek DK, Kolarz CM. The effect of age on positive and negative affect: a developmental perspective on happiness. *J Pers Soc Psychol*. 1998;75 (5):1333-1349.
14. Bogg T, Roberts BW. The case for conscientiousness: evidence and implications for a personality trait marker of health and longevity. *Ann Behav Med*. 2013;45 (3):278-288.
15. Wilson RS, Mendes de Leon CF, Bienias JL, Evans DA, Bennett DA. Personality and mortality in old age. *J Gerontol B Psychol Sci Soc Sci*. 2004;59 (3):P110-P116.
16. Turiano NA, Chapman BP, Gruenewald TL, Mroczek DK. Personality and the leading behavioral contributors of mortality. *Health Psychol*. 2015;34 (1):51-60.
17. Organization WH. *Composite International Diagnostic Interview, CIDI, Version*

10. Geneva, Switzerland: World Health Organization; 1990.
18. Kessler RC, Andrews A, Mroczek D, Ustun B, Wittchen HU. The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF). *International Journal of Methods in Psychiatric Research*. 1998;7 171-185.
19. Wang PS, Berglund P, Kessler RC. Recent care of common mental disorders in the United States : prevalence and conformance with evidence-based recommendations. *J Gen Intern Med*. 2000;15 (5):284-292.