Financial Stressors During the Great Recession and Subsequent Risk of Early Mortality

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ABSTRACT

Objective: The Great Recession in 2008 was a period of severe economic upheaval and myriad financial stressors. Financial stress is associated with poorer health, but for whom is this stress the most health-relevant? The current study examined the association between financial stressors and mortality, as well as whether this association varied based on people's financial status.

Methods: Participants from the Midlife in the United States study ($n = 2760$) were assessed before (2004–2005) and after (2013–2014) the Great Recession (2008). Mortality status was then tracked from 2013 to 2017.

Results: People who experienced more financial stressors during the Great Recession were at greater risk of early mortality over the 4-year follow-up (hazard ratio [HR] = 1.14 [1.00–1.29], $p = .046$). This association was moderated by the importance of financial security ($B = 0.34$ [0.08–0.59], $p = .009$). Financial stressors were more strongly associated with mortality among people who reported that financial security was important to their well-being (HR = 1.29 [1.08–1.54], $p = .006$) compared with people who reported it was not (HR = 1.02 [0.82–1.26], $p = .89$). Household income and subjective financial status did not moderate the association between financial stressors and mortality.

Conclusions: Experiencing financial stressors during the Great Recession was associated with increased mortality over the 4-year follow-up period, particularly for people who reported financial security was important to their well-being. Interventions designed to reduce financial stress to improve health may benefit from targeting people for whom such stressors are particularly important.

Key words: Great Recession, financial stressors, psychological stress, job loss, mortality, health.

INTRODUCTION

Psychological stress is linked to an increased risk of disease (1–4) and early death (5,6). One method to productively study the link between psychological stress and health is by examining health outcomes after the experience of difficult events. People are at increased risk of early death after experiencing stressful life events, including events experienced by individuals—such as job loss (7) and the death of a spouse (8)—as well as those experienced by entire populations, such as economic recessions (9) and natural disasters (10).

The Great Recession (11) was a recent global event that led to financial upheaval at the individual and societal level. Defined in terms of gross domestic product (GDP) as the 2-year period of economic decline after the financial crisis of 2007, this event has been described as the most damaging economic crisis since the Great Depression (12). In total, 8.5 million jobs were lost in the United States alone (13), and these jobs were not recovered until mid-2014 (14). Although evidence for the health-relevance of economic recessions at a national level is mixed (15), downstream health consequences would be expected among the people who experienced financial stressors during the Great Recession, given that exposure to financial stressors (e.g., job loss) is associated with poorer mental (16) and physical health at the individual level (3,9,17).

Who might be particularly at risk of poorer health after a severe economic recession? The number of financial stressors people individually experienced during the Great Recession would likely be one contributing factor. People varied in the extent to which the financial crisis caused them to experience financially challenging or stressful events, such as declaring bankruptcy or losing a home. Those who experienced few (or no) negative financial events during this period might have been insulated from negative health consequences compared with those who experienced a number of such stressors. This potential heterogeneity in experiences and outcomes is effectively illustrated by a recent investigation of mental health during the Great Recession, which found that the prevalence of depression and anxiety decreased among Americans as a whole from 2003 to 2013 (16). However, the subset of Americans who experienced financial stressors during the Great Recession evidenced increased rates of anxiety and depression during this same period (16). National patterns in the United States thus obscured a subset of people at particularly risk of poorer mental health outcomes. In a similar way, we might expect that people who experienced the financial stressors during the Great Recession will most likely face negative health consequences.

GDP = gross domestic product, **MIDUS** = Midlife in the United States

The importance and salience of financial stressors are also likely to play a role in the health relevance of financial stressors. Stress appraisal theory (18) highlights the importance of people's cognitive appraisals in their responses to stressful life events. When stressors are appraised as more threatening or people feel unable to cope with a stressor, they are particularly damaging to people's mental and physical well-being. Individual differences in the extent to which financial stressors are important or threatening could play a role in determining who is most vulnerable to poorer health when experiencing financials stressors. For example, people with lower household incomes or fewer financial resources might appraise financial stressors more threatening. Alternatively, people who value financial security might be particularly affected when that security is threatened by events such as job loss or increased debt. When identifying the people for whom financial stressors during the Great Recession were most detrimental, the degree to which financial stressors might be particularly threatening or salient (19) could act as an important moderator of the absolute number of financial stressors.

Present Study

The present study examined the association between financial stressors during the Great Recession and subsequent mortality in a longitudinal cohort study of US adults ($n = 2760$). It was hypothesized that people who experienced more financial stressors during the Great Recession would have an increased risk of early mortality over a 4-year follow-up, from 2013 to 2017. In addition, it was predicted that the association between financial stressors and mortality would be moderated by financial variables measured before the Great Recession. The association between financial stressors and mortality was expected to be stronger among people who might appraise such stressors as particularly threatening or salient, specifically those with lower levels of household income, lower subjective financial status, or who reported that financial security was important to their well-being.

METHODS

Participants and Study Design

The current study used participants from the Midlife in the United States (MIDUS) study, a longitudinal cohort with three study waves collected every 10 years. The MIDUS 1 sample (20) used a random-digit dialing procedure to recruit noninstitutionalized, English-speaking people between the ages of 25 and 74 years in the United States in 1995 and 1996. The MIDUS 1 sample was assessed 10 years later for the MIDUS 2 assessments (21), which repeated much of the original MIDUS assessment. Participants were then assessed in another 10 years for the

MIDUS 3 assessment (22), and their mortality was tracked for the subsequent 4.5 years, until November 2017 (23). The study sample included participants assessed during MIDUS 2 and 3 who reported on Great Recession financial stressors, financial status, and study covariates at each occasion ($n = 2760$). Participants from MIDUS 3 who were excluded ($n = 534$; 16.2% of MIDUS 3) were primarily excluded because of missing financial status data at MIDUS 2 ($n = 529$; 99.1% of missing). Five additional participants did not report either their education level ($n = 3$) or life satisfaction ($n = 2$) at MIDUS 2. Excluded participants included a higher percentage of men ($t = 2.42$, $p = .016$) and minorities ($t = 4.76$, $p < .001$), and were significantly younger ($t = 2.88$, $p = .004$), less educated ($t = 4.28$, $p < .001$), reported more financial stressors ($t = 3.73$, $p < .001$), and had lower self-rated health ($t = 2.55$, $p = .011$). All effects were small in size, d values ≤ 0.21. Participants who were excluded from the study did not significantly vary from those who were included in terms of mortality status, marital status, life satisfaction, or any measures of financial status. Figure 1 provides a timeline of the MIDUS study assessments and the Great Recession.

Measures

Financial Stressors

Financial stressors during the Great Recession were measured using a sum of 18 items. These items were added to the MIDUS 3 data collection by the MIDUS team specifically to assess the number of difficult financial experiences related to the Great Recession. These items matched those used in a prior study by Forbes and Krueger (16). Participants were asked, "Since the recession began in 2008 have you…": declared bankruptcy, missed a credit card payment, missed other debt payments, increased credit card debt, sold possessions to make ends meet, cut back on spending, exhausted unemployment benefits, lost a job, started a new job you did not like, took a job below your education or experience, took on another job, missed a mortgage or rent payment, were threatened with foreclosure or eviction, sold a home for less than it cost, lost a home to foreclosure, lost a home to something other than foreclosure, family or friends moved in to save money, or moved in with family or friends to save money. Scores were truncated to 10 for participants who reported 11+ stressors ($n = 21$; 0.8%). Primary study results replicated when using the original count.

Mortality

The MIDUS Mortality Study data (23) included information on all known MIDUS decedents as of November 2017. Mortality tracing was conducted by the University of Wisconsin Survey Center. Methods included National Death Index searches and ongoing longitudinal sample maintenance (23). In this study sample, 70 deaths were recorded up to the censor date (2.5%), 4.2 years after the MIDUS 3 assessment on average. Causes of death were missing for 7 participants (10.0%). Of the 63 deaths with an *International Classification of Diseases, Tenth Revision* cause of death, 24 were due to cancer (39.3%), 22 were due to a cardiovascular or related metabolic disease (36.1%), 6 were due to a chronic lung disease (9.8%), and 4 were
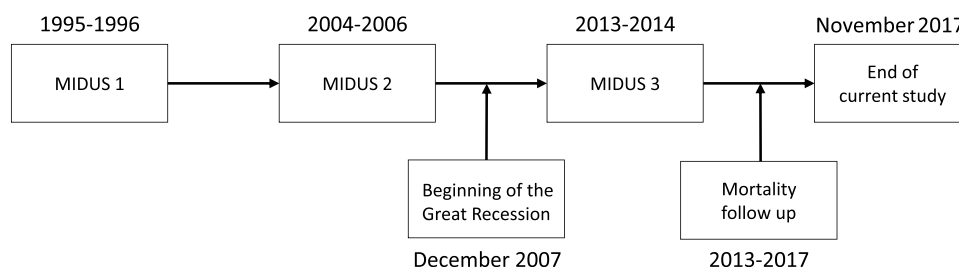

FIGURE 1. Timeline of MIDUS study data collection and the Great Recession. MIDUS = Midlife in the United States.

due to a degenerative neurological disease (6.6%). The remaining five causes of death (8.2%) were due to pneumonia, bleeding from an ulcer, necrotizing fasciitis, a vehicle accident, and a fall.

Financial Moderators

Financial moderators included two measures of financial status—household income and subjective financial status—and two appraisals of the importance of finances—the importance of financial security to well-being and the importance of extra money to well-being. These four measures were assessed at MIDUS 2 (21).

Household Income

Participants reported on the yearly income for their household, including wages, pension, social security, and other sources. MIDUS truncated income to a maximum of $300,000.

Subjective Financial Status

Participants reported on their financial situation at MIDUS 2 on an 11-point scale, ranging from "*worst*" to "*best*" (0–10).

Importance of Financial Security and Importance of Extra Money

Participants were asked to choose 5 of 17 areas they felt were most important to a good life out (e.g., family relations, faith, and autonomy; see Ref. (20)). Selecting "having enough money to meet basic needs" as one of these five areas assessed whether participants felt financial security was important to their well-being. In addition to this moderator variable, selecting "having extra money" as one of the five areas was used to create a variable for participants' reporting that having extra money was important to their well-being.

Study Covariates

Participants reported on a number of variables that were used as covariates. Demographic characteristics included age, sex, marital status, and minority status. Self-reported health was assessed by asking participants, "In general, would you say your health is?" Responses were on a 5-point scale from "*poor*" to "*excellent*." Life satisfaction was assessed by asking participants "At present, how satisfied are you with your life?" Responses were on a 4-point scale from "*not at all*" to "*very.*" Education was assessed on a 12-point scale that assessed participants' highest level of education, which ranged from no schooling/some grade school to a PhD or equivalent degree. All variables were assessed at MIDUS 2, with the exception of age, which were assessed at MIDUS 3 to better account for variation in the date of MIDUS 3 assessment. The MIDUS 3 assessment date was included as a covariate. Most participants (88.3%) completed MIDUS 3 between June and August 2013.

Data Analysis

Cox proportional hazard models were used to test the association between financial stressors during the Great Recession and time to death over the follow-up period, from 2013 to 2017. The first model tested the association between financial stressors and mortality. The next models moderated this association by the three financial status variables—household income, subjective financial status, and the importance of financial security—in independent models. The next model then compared whether an additional variable assessing the importance of extra money moderated the association between financial stressors and mortality. Exploratory sensitivity analyses were also conducted to test whether the association between financial stressors and mortality varied by financial status among people who reported financial security was important to their well-being. All models controlled for age, sex, physical health, life satisfaction, marital status, minority status, education, and date of MIDUS 3 assessment. Results for the primary predictors were reported in terms of hazard ratios (HRs), and unstandardized effects (B) were also reported for interaction terms. Analyses were

conducted in SPSS version 27 and MPLUS version 8.3 (24) using maximum likelihood estimation.

RESULTS

Study participants were 55.9% female and 63.9 years old on average (standard deviation = 11.4). Importantly, the majority of participants (73.6%) felt the Great Recession was still ongoing at MIDUS 3, 2.5 years after the recession "ended" as defined by GDP. In total, 70 deaths were observed during the follow-up (2.5%), predominantly a result of chronic diseases (91.8% of deaths). Table 1 provides sample demographics.

Financial Stressors and Mortality Status

The more financial stressors people experienced during the Great Recession, the greater their risk of early death during the follow-up period (HR = 1.14 [1.00–1.29], p = .046), such that each additional financial stressor was associated with a 14% increased risk of death. Full results are presented in Table 2.

Moderation by Financial Status

The next models examined whether three variables related to financial status—household income, subjective financial status, the importance of financial security—moderated the association of financial stressors and mortality. None of the financial status variables were directly associated with mortality status (all p values ≥ .67). When adding the interaction effects independently, the association between financial stressors and mortality was not significantly moderated by either household income or subjective financial status (Table 2). However, the importance of financial security significantly moderated the association between financial stressors and mortality (B = 0.34 [0.08–0.59], p = .009). People who reported financial security was important to their well-being were more likely to die if they experienced financial stressors (HR = 1.29 [1.08–1.54], p = .006), whereas there was no

TABLE 1. Demographic Characteristics of Study Participants

n = 2760	
No. financial stressors	
Mean (SD)	1.9 (2.2)
Range	0–10
Age, y	
Mean (SD)	63.9 (11.4)
Range	39–93
% Women	55.9
% Married	72.8
% White non-Hispanic	92.9
% With some college education	72.7
Median (SD) household income, US$	62,500 (60,941)
Subjective financial status, mean (SD)	
Mean (SD)	6.6 (2.1)
Range	0–10
Financial status reported as important to well-being, %	33.6

Data are percentages and means ± SDs unless otherwise noted. Participants' age indexes at MIDUS 3.

SD = standard deviation.

TABLE 2. Association of Financial Stressors During the Great Recession of 2008 With an Increased Risk of Mortality: Main Effect and Interaction Effects of Survival Analysis Models

n = 2760	Main Effect Model Results		Interaction Models Results	
	HR	95% CI	HR	95% CI
Financial stressors	1.14*	1.00–1.29	0.96	0.78–1.19
Age	1.12**	1.09–1.15	1.12**	1.09–1.15
Sex	0.79	0.49–1.29	0.80	0.49–1.31
Marital status	1.45	0.81–2.61	1.41	0.78–2.56
Minority status	1.19	0.66–2.13	1.22	0.68–2.19
Education	1.06	0.97–1.17	1.06	0.96–1.17
Self-rated physical health	1.70**	1.33–2.18	1.67**	1.30–2.15
Life satisfaction	0.92	0.60–1.40	0.89	0.57–1.39
Date of MIDUS 3	0.22	0.03–1.92	0.25	0.03–1.99
Household income			1.00	0.99–1.01
Subjective financial status			0.98	0.85–1.12
Importance of financial security			0.52*	0.26–0.99
Financial stressors by subjective financial status			0.96	0.92–1.00
Financial stressors by household income			1.00	0.99–1.01
Financial stressors by importance of financial security			1.40**	1.09–1.80

All interaction model results reflect results from the model that included the financial stressors by importance of financial security interaction term, with the exception of the estimates for the other two interaction terms, which reflect estimates from the independent models assessing those interaction terms. Household income was measured in hundreds of dollars.

HR = hazard ratio; CI = confidence interval.

Marital status was coded as 0 = unmarried and 1 = married. Ethnicity was coded as 1 = non-Hispanic Whites and −1 = all others. Sex was coded as 1 = men and 2 = women.

* $p \le .05$.

** $p \le .01$.

association for those who did not (HR = 1.02 [0.82–1.26], $p = .89$). Deaths were relatively evenly divided between these two groups: 40% of deceased participants ($n = 28$) reported financial security was important to their well-being, whereas 60% of deceased participants ($n = 42$) did not.

One additional question was whether the importance of having enough money to meet basic needs was particularly relevant to the association between financial stressors and mortality, or if the importance of having extra money to well-being might also moderate this association. When testing this interaction term by adding it to the final model from the previous analyses, the importance of extra money did not significantly moderate the association between financial stressors and mortality ($B = −0.49$ [−1.33 to 0.35], $p = .26$), and the effect was in the opposite direction to that for financial security. These results suggest it is the importance of having enough money to meet basic needs, not having extra money, that was relevant to the primary results.

Sensitivity Analysis: Stratifying Moderation Results by Financial Status

The association between financial stressors and mortality did not vary based on household income or subjective financial status; however, it was possible that this association varied based on financial status among the people who valued financial security ($n = 954$). Exploratory sensitivity analyses were conducted to investigate this possibility. In this group, the interaction of household income and financial stressors was not associated with mortality over the follow-up ($B = −0.01$ [−0.01 to 0.00], $p = .938$). Descriptively, people with lower incomes evidenced similar mortality risk associated with financial stressors to that of people with higher incomes when stratifying the sample using a median split (HR = 1.31 [1.04 to 1.66], $p = .024$; HR = 1.30 [0.97 to 1.73], $p = .076$). In contrast, subjective financial status and financial stressors interacted to predict mortality risk over the follow-up ($B = −0.07$ [−0.13 to 0.01], $p = .014$). People with lower subjective financial status evidenced a stronger association between financial stressors and mortality when compared with people with higher incomes (HR = 1.36 [1.08 to 1.73], $p = .010$; HR = 1.13 [0.79 to 1.60], $p = .506$). The results suggest that financial stressors might be particularly consequential to the health of people with lower subjective financial status who also value financial security, although these results should be interpreted with caution given their exploratory nature.

DISCUSSION

Using a sample of 2760 US adults, this study found that people who experienced financial stressors during the Great Recession were at greater risk of early death during a 4-year follow-up. Each financial stressor was associated with a 14% increased risk of death. The size of this effect was similar to the increased risk of death associated with 1 year of chronological aging (12%). The risk associated with financial stressors also varied based on whether people valued financial security. For people who reported financial security was important to their well-being, each financial stressor was associated with a 29% increased risk of mortality, whereas there was no increase in risk for those who did not.

Notably, it was the importance of having enough money to meet basic needs that increased the risk of early death associated with financial stressors, rather than household income or subjective financial status before the Great Recession. It was plausible that people in a worse financial position, in terms of either objective income or subjective rating of their financial status, could face more health consequences when facing the same number of financial stressors as those with more financial resources. However, these results do not provide evidence of this. Among those who reported financial stressors, these experiences were associated with mortality to a similar degree across income ranges and subjective financial statuses. These results align with previous research that has found financial strain is predictive of poorer physical health regardless of income level (25,26). Also of interest was that participants' reports of the importance of having *extra money* to well-being were not relevant to the association between financial stressors and mortality. This suggests it is not having extra money that is relevant to this association, but the importance of having enough money to meet basic needs.

These findings are particularly relevant to the groups of people who are more likely to experience financial stressors. Financial stress is not equally distributed across populations—people who are economically disadvantaged are more likely to experience financial hardship and distress (27). For example, participants from this study were significantly more likely to experience financial stressors during the Great Recession if they had a lower subjective financial status ($r = −0.37$, $p < .001$) or household income before the Great Recession ($r = −0.11$, $p < .001$). Although financial stressors were associated with mortality across income ranges and subjective financial statuses, people who were more economically disadvantaged were at greater risk of experiencing such financial stressors. As a result, this group faces a greater risk of the negative health consequences associated with financial stressors. Interventions that reduce the psychological impact of financial stressors could be one method to reduce these health consequences, particularly during periods of financial instability.

A central implication of this study is that financial stressors were most relevant to the health of people who identified financial security as important to their well-being. People who value financial security may appraise financial stressors as particularly threatening, aligning well with stress appraisal theory (18). Notably, the importance of financial security was not independently associated with mortality. People who identified financial security as important to their well-being were only at risk of early death after the Great Recession if they also experienced financial stressors. Whether financial stress or another type of stressful event—such as trauma, divorce, or widowhood—there is considerable heterogeneity in people's response to stressful life events. Most people are resilient in the face of adversity (28,29), making it essential to determine who is at the greatest risk after financial stressors to effectively allocate resources during periods of individual or societal economic adversity.

The timelines of the MIDUS data collection and the Great Recession are relevant to interpreting the results of the current study. The majority of MIDUS 3 assessments occurred in mid-2013, approximately 4 years after the end of the Great Recession as assessed by change in US GDP. This lag time might create concerns regarding whether the current results can be attributed to the financial stressors during the Great Recession. It is important to note, however, a large majority of the sample (73.6%) indicated they felt the Great Recession was still ongoing when they completed the MIDUS 3 assessment. This matches with measures of job loss, which did not recover to prerecession levels until mid-2014 (14). In addition, the assessment of the financial stressors was specific to financial events that occurred "since the recession began in 2008," rather than any financial stressor since the prior MIDUS 2 assessment (2004–2005). These results not only reflect financial stressors during the Great Recession but also support the broader health relevance of psychological stress and stressful life events (1–10). The financial stressors assessed in this study can occur outside the context of the Great Recession, and it is possible that future financial crises could result in early mortality due to psychological stress.

The results of the current study should be understood in the context of its limitations. First, although the total sample was large, 70 deaths were observed during the follow-up period. This limited the statistical power of the models used in the study, and the effects observed in this study should be interpreted within the context of a small absolute number of deaths in comparison to the total sample. Once additional data collection occurs in the MIDUS study in the future (e.g., a potential MIDUS 4), it would be useful to examine other outcomes, such as chronic diseases prevalence, that could be used to support and extend the current findings. Second, the count of financial stressors used in the study assessed whether events occurred, but not how often they might have occurred or the extent to which participants experienced specific events as stressful. Future studies would benefit from assessing the frequency and intensity of financial stressors. Third, the study assessed participants approximately 4 years after the end of the Great Recession and cannot account for people who experienced financial stressors but died before MIDUS 3 assessment in 2013. Fourth, the study inferred the importance of the financial stressors from financial status variables, and future studies would benefit from directly assessing people's primary and secondary appraisals of financial stressors.

CONCLUSIONS

This study examined the association of financial stressors during the Great Recession and mortality during a 4-year follow-up, from 2013 to 2017. People who experienced more financial stressors were at greater risk of death over the follow-up period, and this association was particularly strong among people who reported that financial security was important to their well-being. The results highlight the need to account for the context of stressful events when determining who is at risk of poorer health due to stressful life events. Public health interventions aiming to reduce the health consequences of economic upheaval at the individual and societal level would benefit from targeting people who experience financial stressors and report financial security is important to their well-being.

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