



The Relationship Between Financial Worries and Psychological Distress Among U.S. Adults

Soomin Ryu¹ · Lu Fan²

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Abstract

This study examines the association between financial worries and psychological distress among US adults and tests its moderating effects by gender, marital status, employment status, education, and income levels. Data were derived from the cross-sectional 2018 National Health Interview Survey (NHIS) of the adult population. The hierarchical regression analysis revealed that higher financial worries were significantly associated with higher psychological distress. Additionally, the association between financial worries and psychological distress was more pronounced among the unmarried, the unemployed, lower-income households, and renters than their counterparts. The findings suggest that accessible financial counseling programs and public health intervention programs are needed to mitigate financial worries and its negative influences on overall psychological health, with greater attention devoted to vulnerable populations.

Keywords Financial worries · Financial strains · Psychological distress · Mental health

Introduction

A substantial number of U.S. families face financial strains and financial vulnerability (Federal Reserve System, 2019). According to the Survey of Household Economics and Decision-Making in 2019, 3 in 10 adults had difficulty meeting their financial needs. Additionally, about 37% of the adults reported the inability to cope with short-term liquidity needs. According to the latest data from the Census Bureau's Household Pulse Survey in January 2021, 11% of U.S. adults said that their household sometimes or often did not have enough to eat in the last seven days, while 1 in 5 adults living in rental housing could not pay their rent. These financial strains raise concerns of the negative influences they have on consumer finances (McCloud & Dwyer, 2011), health behaviors and outcomes (Choi, 2018; Rantakeisu et al.,

1999; Sampson et al., 2021), and overall family well-being (Park et al., 2017).

Growing evidence reveals that financial strains and worries play significant roles in mental health (Asebedo & Wilmarth, 2017; Bradshaw & Ellison, 2010; Marshall et al., 2020). In the US, one in five adults lives with a mental illness, of which 7.8% experience major depressive episodes and 19.1% have anxiety disorders (Mental Health America, 2020). According to the National Institute for Health Care Management, the prevalence rates of any mental illness and serious mental illness increased by 8% and by 24% in 2018 compared to 2008, respectively. A Pew Research Center (2021) report shows that worries about personal health and financial security are related to higher levels of psychological distress. This is an alarming trend, given that psychological distress is associated with several adverse health outcomes, such as emotional exhaustion, reduced immune response, heart disease, and increased mortality (Arvidsdotter et al., 2016; Barry et al., 2020; Marshall et al., 1998; McLachlan & Gale, 2018; Rasul et al., 2005; Segerstrom & Miller, 2004).

Although financial strains can be both objective (i.e., stressor events) and subjective (i.e., perceived stress) (Asebedo & Wilmarth, 2017), several studies have focused mainly on objective indicators. The negative association between poverty and mental health outcomes is well

✉ Lu Fan
lufan@uga.edu
Soomin Ryu
sryu7@umd.edu

¹ School of Public Policy, University of Maryland, 2101 Van Munching Hall, College Park, MD 20742, USA

² Department of Financial Planning, Housing and Consumer Economics, University of Georgia, 205 Dawson Hall, 305 Sanford Drive, Athens, GA 30602, USA

established in public health and epidemiology (Belle, 1990; Belle & Doucet, 2003; Das et al., 2007; Patel & Kleinman, 2003). In addition to poverty, financial debt and loans are significantly associated with increased psychological distress and poor mental health status (Brown et al., 2005; Drentea & Reynolds, 2012, 2015; Gunasinghe et al., 2018; Hiilamo, 2020; Jenkins et al., 2008; Meltzer et al., 2013; Sun & Houle, 2020; Sweet et al., 2013; Tsai et al., 2016; Zhang & Kim, 2019; Zurlo et al., 2014). However, only a few studies have examined the influences of individuals' subjective appraisals of their financial situation on their psychological distress, despite their greater significance on mental health outcomes than the objective measures of debt (Bridges & Disney, 2010; Drentea, 2000; Hamilton et al., 2019; Prawitz et al., 2006).

This study focuses on financial worries, which are emotional responses to or perceptions of economic hardship (Bradley et al., 2009) and subjective aspects of financial strain (Asebedo & Wilmarth, 2017). The subjective measures of financial strain, such as financial worries, provide information independent of objective measures and do not directly correspond to the objective financial strain (Weissman et al., 2020). This is because subjective measures indicate how the financial condition is perceived, while objective measures do not measure the depth of one's feelings about or reaction to it (Prawitz et al., 2006). Moreover, personal socio-economic factors could be differently associated with the relationship between individuals' perceptions and their emotional responses to their economic hardship. For example, debt could be higher among higher-income households (Chawla & Uppal, 2012), but the burden of the perceived stress related to debt could be higher among lower-income households due to their low job security and lower supports (Hamilton et al., 2019). Additionally, individuals with similar income levels can have different levels of financial worries due to their different consumption values and spending habits as well as their various demands on income such as food, healthcare, transportation, and housing (Huang et al., 2010; Prawitz et al., 2006). For this reason, objective measures of financial conditions were less useful in evaluating their effects on individuals' health outcome and the need for appropriate intervention (Prawitz et al., 2006). Several studies also suggested that perceived financial hardship was more important than objective measures of debt on self-reported health or mental health outcomes such as depression and anxiety (Bridges & Disney, 2010; Drentea, 2000; Drentea & Lavrakas, 2000; Drentea & Reynolds, 2012; Hamilton et al., 2019). The current study can fill this literature gap by focusing on financial worries that reflect the perception of one's financial hardship and its relationship with psychological distress.

Establishing a deeper understanding of financial worries is important because it can have prolonged detrimental

influences on individuals over their life span. For example, young adults who experienced adverse circumstances in childhood or come from poor families demonstrated greater financial and mental vulnerability (Choi, 2009). The literature also showed that adverse financial strain in childhood could lead to reduced mental health in adulthood (e.g., East et al., 2020). The perceived financial worries of college students could mediate the relationship between chronic financial strain experiences and their academic and social integrations and psychological health, which could thereby influence their well-being later in life (Adams et al., 2016). A similar relationship between long-term financial strain and health was also observed among older adults, specifically, perceived long-term financial strains over the life-course were significantly related to some health-related outcomes in later life, such as self-rated health status, depressive symptoms, and functional impairment (Kahn & Pearlin, 2006).

This paper examined the relationship between subjective financial worries and psychological distress among U.S. adults using a nationally representative data of 2018 National Health Interview Survey (NHIS). Moreover, we further assessed whether this relationship differs depending on socio-economic characteristics by evaluating the moderating roles of gender, marital status, education, employment status, household income, and homeownership. This paper makes a unique contribution to the literature by focusing on the subjective aspect of financial strains and the moderating effects of socio-economic characteristics in the association with psychological distress. Understanding the relationship between financial worries and psychological health is timely and crucial, given the upsurge in household financial hardship and mental health problems due to the prolonged COVID-19 pandemic (Li & Mutchler, 2020; Nelson et al., 2020; Witteveen & Velthorst, 2020; Xiong et al., 2020; Zheng et al., 2021). Accordingly, a better understanding of the role of financial worries on psychological distress is crucial for improving public health and financial wellness and stability.

Theoretical Background and Literature Review

Theories related to stress, such as stress process theory (Pearlin et al., 1981) and stress coping theory (Lazarus & Folkman, 1984), have mainly focused on the stress process and its adverse consequences, including mental, physical, and emotional outcomes. Social stress theory, on the other hand, emphasizes whether social distribution of stress exists and whether there are social variations and group differences in psychological distress as a response to different stressors (Aneshensel, 1992). According to social stress theory, certain disadvantaged groups in the population could have more

severe psychological distress due to their greater vulnerability to stress and fewer coping resources, which thereby can lead to higher risks of mental illness and disorders (Mosakowski, 2014). Therefore, in this study, we examined a domain-specific perceived source of stress – financial worries – in relation to psychological distress as the mental health outcome and the moderations of social variations by socio-demographic characteristics.

Psychological distress refers to an emotional state of discomfort and suffering experienced by an individual with depression and/or anxiety symptoms, which could be a response to a stressor and can persist in the absence of such a stressor (Drapeau et al., 2012; Ridner, 2004). It is an indicator of mental health problems and can significantly affect psychological well-being (Veit & Ware, 1983) and quality of life (Bech, 1990), and is often tested as a health outcome of stress. Given the significant link between financial strain and mental health (Asebedo & Wilmarth, 2017; Choi, 2009; Selenko & Batinic, 2011), several studies have examined the relationship between personal debt and loans and psychological distress. There is growing evidence that debt and loans are positively associated with psychological distress, as they increase anxiety, distress, and depression levels in individuals (Drentea & Reynolds, 2012; French & McKillop, 2017; Gunasinghe et al., 2018; Hiilamo, 2020; Hiilamo & Grundy, 2020; Jenkins et al., 2008; Meltzer et al., 2013; Sun & Houle, 2020; Sweet et al., 2013). One possible explanation for these associations is the negative perceptions of such financial liabilities. Emotional reactions to such liabilities among these debtors, such as the fear of debt or the shame and anxiety from actually or potentially defaulting on it, could also produce such an association (Manning, 2000; Starrin et al., 2009; Sullivan et al., 2000).

More recently, researchers have focused on financial stress or worries that are distinct from debts, loans, and other objective indicators of financial hardship. While objective indicators are characterized by the objective inability to meet current financial needs, perceived financial strain is characterized by an individual's subjective perception of the financial situation (Sinclair et al., 2010). Studies have suggested that financial worries and anxiety are negatively related to overall mental health and can trigger negative perceptions of individuals' own ability to manage money as well as decreased financial well-being (American Psychological Association, 2015; Archuleta et al., 2013; Park et al., 2017; Shapiro & Burchell, 2012; Summers & Gutierrez, 2018). Notably, though, research reveals that those with health problems (e.g., cancer, mental disorder) might suffer more from medical expenditures, debt, and financial burdens, which could also worsen life quality (e.g., Fenn et al., 2014; Ringel & Sturm, 2001).

Subjective financial stress and worries have also been identified as important indicators of psychological distress

(Drentea & Lavrakas, 2000; Prentice et al., 2017; Sweet et al., 2013; Szanton et al., 2010). In particular, studies have focused on the relationship between financial worries and psychological distress among adults. Using a cross-sectional survey of 8045 adults aged 18 years and older in Ontario, Canada, Hamilton et al. (2019) found that debt stress was significantly associated with psychological distress in addition to self-rated overall mental health. In this study, debt stress was assessed by measuring financial stress from all sources of debt in a household (including mortgages, credit cards, home equity loans, car loans, and other debts), while psychological distress was measured using the Kessler-6 (K6) psychological distress scale (Kessler, 2003). Focusing only on working individuals in Canada, Koltai et al. (2018) also found a positive association between subjective financial strain and psychological distress. The authors assessed subjective financial strain using questions regarding whether the participants' finances covered their bills by the end of the month and whether they had trouble paying for daily necessities. Psychological distress was measured using seven items from the Kessler index of psychological distress scale.

This significant association between financial worries and psychological distress was also reported in two studies that used a nationally representative sample of U.S. adults from the National Health Interview Survey (NHIS) (Tsuchiya et al., 2020; Weissman et al., 2020). Both studies assessed psychological distress using the K6 psychological distress scale and financial worries using questions to measure concern about specific types of financial difficulties (e.g., healthcare expenses, housing costs, monthly bills, standard of living costs, retirement contributions, children's college tuition).

The current study examined different aspects of financial worries and the association with psychological distress based on stress process and stress coping theories and the empirical findings and proposes moderating roles of socio-economic status of individuals in this association based on the social stress theory, which suggests that certain disadvantage populations may be more vulnerable of mental health issues due to the lack of coping resources.

Socio-economic Characteristics as Moderators

Social stress theory explains that disadvantaged populations could experience mental health problems due to their greater vulnerability to stress and fewer coping resources (Mosakowski, 2014). The literature also suggests that socio-economic characteristics can play moderating effects that could worsen or buffer the negative relationship between financial worries and psychological distress. Therefore, adults with lower socio-economic status may have a stronger association of financial worries and psychological distress. However, little research has studied these characteristics and the

subpopulations that could be more significantly affected by financial worries.

Gender

Prior studies have documented that women are at higher risk of experiencing mental health problems than men, including psychological distress, depression, anxiety, and mood disorders (Ferraro & Nuriddin, 2006; Goldberg et al., 1988; Kessler, 2003; Madden, 2010; Matud et al., 2015; Seedat et al., 2009). Women also suffer from greater structural strain and hardship due to gender inequality, which increases the risk of adverse health outcomes (Ross & Huber, 1985). As risks accumulate over long periods, women are more likely to experience psychological distress (Archuleta et al., 2013; Ferraro & Nuriddin, 2006; Keith, 1993). Thus, psychological distress among females could be more prevalent due to financial worries than among males.

Marital Status

Marriage influences various dimensions of individuals' lives. Compared to unmarried individuals, married individuals report a lower risk of long-term illness, disability, physical problems, and death from various causes (Murphy et al., 1997; Waite & Lehrer, 2003). Moreover, a growing body of research has found that marriage is beneficial to mental health outcomes. Both married men and women experience improved emotional and psychological well-being, including less psychological distress, depression, and psychiatric disorders (Darghouth et al., 2015; Horwitz et al., 1996; Simon, 2002; Waite & Gallagher, 2000; Williams et al., 2009). Marriage has been found to be correlated with financial well-being. Husbands and wives can produce more than twice the amount each could produce individually through the division of labor and specialization (Becker, 1991). In addition to earnings, marriage encourages savings. Lupton and Smith (2003) documented that married couples had much greater net worth compared to the never married, divorced, widowed, or separated. This might be because married people behaved more responsibly regarding earnings and assets due to the responsibilities felt for spouse or children (Schwartz, 2005).

Education

Individuals who are better educated tend to have higher debt compared to those with lower education (Chawla & Uppal, 2012). However, they are also more likely to know how to avoid and cope with adverse situations (Aneshensel, 2009). For example, Steele and colleagues (2007) found that individuals with higher educational attainment were more

likely to see psychiatrists, family doctors, psychologists, and social workers than those with lower education when they had anxiety or depressive disorder problems. Researchers suggested that those who were less educated reported higher levels of depression compared to those with a college degree (Asebedo & Wilmarth, 2017). Therefore, education can buffer the negative effects of financial worries on psychological distress.

Employment Status

Employment provides an important source of income that offsets debt (Hamilton et al., 2019), which may decrease worries related to financial strains. Moreover, it allows individuals to build up social networks and establish social status that can support both economic and mental health well-being (Selenko & Batinic, 2011). A growing body of literature suggests that unemployment has significantly adverse effects on mental health. For example, a meta-analysis of 237 cross-sectional and 87 longitudinal studies found that unemployed individuals reported greater distress than employed individuals (Paul & Moser, 2009). According to the absolute income effect hypothesis, loss of income due to unemployment reduces personal investment in nutrient-rich food and health-promoting goods and restricts access to medical health care, which deteriorates physical and mental health (Drydakis, 2015; Kawachi & Beckman, 2000; Kawachi & Wamala, 2006).

Household Income and Homeownership

Total debt is found to be higher among homeowners and those in higher-income households compared to renters and members of lower-income households (Chawla & Uppal, 2012; Cox et al., 2007). However, this is likely because they have higher values of properties, assets, and income. Additionally, they are financially less vulnerable to changes in macroeconomic and financial conditions (Cox et al., 2007). Therefore, the burden of debt and perceived stress related to debt could be lower among homeowners and higher-income households compared to renters and members of lower-income households (Hamilton, 2019). Moreover, it has been well documented that individuals who own a home and earn higher incomes have access to healthcare services, including medical treatments or counseling services. Economic advantage could also be a protective factor against the negative effects of financial worries on mental health.

To date, limited research has been conducted on the moderating effects of socio-economic variables in the relationship between financial worries and mental health outcomes. We identified three relevant studies to support these points. The first

study, using a Canadian sample, reported that the associations between debt stress and psychological distress did not vary by gender, age, employment status, income, or education (Hamilton et al., 2019). The second study was conducted in Portugal and found that age was a moderator for the relationship between financial threat and the Depression Anxiety Stress Scale, but found no moderating roles of gender, marital status, or professional situation (Viseu et al., 2019). The last study used a U.S. college student sample and reported that gender moderated the relationship between financial stress and general anxiety symptoms (Tran et al., 2018). There have been few empirical investigations into these socio-economic factors' moderating roles in the association between financial worries and psychological distress for the overall U.S. population.

Using nationally representative data, the current study fills in the gaps in this research area by focusing on the relationship between financial worries and psychological distress and the potential moderators in this relationship, which is an understudied topic among U.S. populations. We hypothesized that there is a positive relationship between financial worries and psychological distress among U.S. adults. We also hypothesized that the association between financial worries and psychological distress is greater for particular subpopulations based on their socio-economic characteristics.

Methods

Data and Study Sample

The data were obtained from the annual National Health Interview Survey (NHIS) in 2018. The NHIS is a cross-sectional survey that is nationally representative of the civilian, non-institutionalized U.S. population. The NHIS is conducted by the Centers for Disease Control and Prevention (CDC) National Center for Health Statistics (NCHS). The survey employs multistage probability sampling and stratification, clustering, and oversampling. The staff of the U.S. Census Bureau conducted interviews in person with all adult household members who were home at the time of the interview and who agreed to participate. One adult member of each household was randomly selected to offer additional in-depth information about their families and themselves. The analytic sample included 22,682 U.S. adults aged 18 to 85 years, which represents a cross-sectional sample generated using the adult data file. The average age of the analytic sample participants was 49.69. Overall, 53.48% were female, 78.73% were White, and 50.80% were married or cohabiting. The number of children under 18 was 0.53 on average (ranging from 0 to 10). Of the respondents, 34.52% had a college degree or higher, 25.00% earned \$100,000 or more in household income, 61.46% were employed, and 63.05%

owned a home. 25.62% self-reported their health status as excellent, and the average number of chronic conditions was reported as 0.84 (ranging from 0 to 8). Among all participants, 90.34% had health insurance coverage.

Variables

Dependent Variable

Psychological distress was assessed using the Kessler 6 Scale (K6). The scale (Kessler et al., 2002) is composed of six indicators of psychological and emotional state. Respondents reported how often they felt nervous, hopeless, restless, depressed, worthless, or that “everything was an effort” within a 30-day recall period. Responses to the six items were scored from 0 (none of the time) to 4 (all of the time) and were summed to construct a scale with total scores ranging from 0 to 24. Higher scores indicated higher psychological distress (Mitchell & Beals, 2011). The measure was used as a continuous variable (Cronbach's alpha = 0.85) in the statistical analyses.

Independent Variable

We assessed financial worries using six questions¹ regarding the levels of worry based on concerns about personal and healthcare associated financial matters: (1) maintaining a standard of living, (2) paying medical costs from illness/accident, (3) paying for housing (rent, mortgage, etc.), (4) paying medical costs for health insurance, (5) having enough money for retirement, and (6) paying monthly bills. All questions were answered on a 4-point scale, where 1 = “not worried at all”, 2 = “not too worried”, 3 = “moderately worried”, and 4 = “very worried”. An aggregate score was created ranging from 6 to 24, with a higher score indicating greater financial worries (Cronbach's alpha = 0.92; range 6 to 24) (Caraballo et al., 2020; Nguyen et al., 2021; Valero-Elizondo et al., 2019; Weissman et al., 2020).

Control Variables

Demographic and socio-economic characteristics included age, gender, race, marital status, number of children under 18 in the family, region of residence, education, household income, employment status, and homeownership. Age was a continuous variable (years), while race was recoded into White, Black, Asian/American Indian/Alaskan Native, and

¹ Based on previous studies, two questions on the level of worry about paying credit card bills and paying for children's college are not included due to a large number of missing values (Caraballo, 2020; Nguyen et al., 2020; Valero-Elizondo et al., 2019; Weissman et al., 2020).

other races. The number of family members under 18 was included as a continuous variable, ranging from 0 to 10. Region of residence was a four-level categorical variable (Northeast, North central/ Midwest, South, and West). Education was categorized as follows: less than high school, high school graduate, some college, and college graduate or above. Health-related variables included self-reported health, the number of chronic conditions, and health insurance coverage. Self-reported health status was a five-categorical variable (excellent, very good, good, fair, and poor), and the measure was coded so that higher numbers reflected better overall health. The presence of chronic conditions was assessed using questions on 10 of the 20 health conditions identified by the U.S. Department of Health and Human Services (DHHS) to create a consistent and standardized approach to defining chronic conditions in the US (Goodman et al., 2013; Ward & Schiller, 2013; Zhang et al., 2017). Participants were coded as 1 if they had ever been told by a doctor or health care provider that they had at least 1 of the following 10 conditions: hypertension, coronary heart disease, stroke, diabetes, cancer, arthritis, or hepatitis; weak or failing kidneys during the past 12 months; asthma (current/ongoing); or chronic obstructive pulmonary disease (COPD).² Responses to the six items were summed to generate a measure of the number of chronic conditions.

Socio-economics Characteristics as Moderators

For moderators, we used gender, marital status, education, employment status, household income levels, and home ownership. Gender was categorized as male and female. Employment status was recoded into employed, unemployed, and retired, while marital status was also classified as binary (1 = married/cohabiting and 0 = other (including separated, divorced, widowed, or never married)). Education was recoded into low education (high school graduate or below) and high education (some college or above). Household income level was classified as < \$35,000, \$35,000–\$74,999, \$75,000–\$99,999, and ≥ \$100,000. Homeownership was included as a binary variable (homeowners and non-homeowners).

Statistical Analysis

First, descriptive statistics were conducted and reported. Means and standard deviations were presented for continuous variables, while frequencies and percentages were

reported for categorical variables. Second, we performed hierarchical regression analysis using three regression models. Model 1 estimated the associations between financial worries and psychological distress without any covariates. Model 2 added demographic characteristics (i.e., age, gender, race, marital status, the number of children in the household, region of residence) and socio-economic characteristics (i.e., education, employment status, household income, and homeownership) to Model 1, while Model 3, the full model, added health-related variables (i.e., self-reported health status, the number of chronic conditions, and having health insurance coverage) to Model 2. Additionally, we estimated the association between each item of financial worries and psychological distress using the full model as a robustness check. Finally, we examined the interaction terms to test for the moderating effects of gender, marital status, education, employment status, household income, and home ownership for the association between financial worries and psychological distress. Sampling weights were applied to derive nationally representative estimates and to generate standard errors that accounted for the complex sample design. Statistical analyses were conducted using Stata version 15.1.

Results

Weighted descriptive statistics of psychological distress, financial worries, sociodemographic characteristics, and health-related variables are presented in Table 1 (n = 22,682). Means and standard deviations are presented for continuous variables, while percentages are reported for categorical variables. The mean of the psychological distress scale was 2.98, while the mean of the financial worries scale was 12.01. We also compared the mean of financial worries and psychological distress by potential moderator, and the results are reported in Appendix 1. On average, both financial worries and psychological distress were greater for female and individuals who were unmarried, unemployed, lower educated, lower income earners and renters compared to those who were married or cohabiting, higher educated, employed, higher income earners and homeowners.

Table 2 presents the results of the linear regression models to estimate the associations between financial worries and psychological distress. Across all models, a higher degree of financial worries was significantly associated with

² COPD was assessed by using responses from two questions on whether they had ever had emphysema or had chronic bronchitis in the past 12 months; adults who answered yes to either question were identified as having COPD.

higher psychological distress (all p -values < 0.001). Without any control variables, a 1-point increase of financial worries scale was associated with an increase in psychological distress scale by 0.315. This positive pattern was maintained in Models 2, which further adjusted for demographic (i.e., age, gender, race, marital status, the number of children in the household, and region of residence) and socio-economic characteristics (i.e., education, employment status, household income, and home ownership) that could be on the pathway. In Model 3, which additionally adjusted for self-reported health, health insurance coverage, and number of chronic conditions, the magnitude decreased slightly, to 0.257. Women were more likely to have higher psychological distress than men. Compared to White, Black and Asian/American Indian/Alaskan native had lower psychological distress but other races had higher psychological distress. Individuals who were married or cohabiting were less likely to face psychological distress than those who were separated, divorced, or widowed or had never married. Individuals who were employed and retired were more likely to have lower psychological distress compared to those who were not employed. Participants with the lowest household income had higher psychological distress compared to the those in the highest household income category. Being in better general health, which was measured by self-reported health status and the number of chronic conditions, was negatively associated with psychological distress. Having health insurance coverage was positively associated with psychological distress. Additionally, we confirmed that each item of financial worries individually was significantly associated with an increase in psychological distress across all models (See Appendix 2), showing the robustness of our main results.

We tested gender, marital status, education, employment status, household income, and home ownership as moderators of the relationship between financial worries and psychological distress using Model 3 (the full model). The results and Wald F-test results of each interaction are provided in Table 3. The results indicated that interaction terms for marital status, employment status, household income, and homeownership were significant at $p < 0.001$. For married individuals, the association between financial worries and psychological distress decreased by 0.070 than those who were separated, divorced, widowed, or never married. Compared to unemployed individuals, the association between financial worries and psychological distress decreased for the employed and retired individuals by 0.125 and 0.133, respectively. Regarding household income, those who earned less than \$35,000 and those who earned between \$35,000 and \$74,999 faced larger associations between financial worries and psychological distress by 0.124 and 0.069 relative to those earning \$100,000 and higher. In terms of homeownership, participants who owned a home had a lower association between financial worries

Table 1 Characteristics of the study participants, 2018 National Health Interview Survey (n = 22,682)

	Total Mean (SD) or %
Age (range 18–85)	49.69 (18.42)
<i>Gender</i>	
Male	46.52
Female	53.48
<i>Race</i>	
White	78.73
Black	12.40
Asian/American Indian/Alaskan native	6.40
Other races	2.46
<i>Marital status</i>	
Married or cohabiting	50.80
Separated, divorced, widowed, or never married	49.20
Number of children under 18 (range 0–10)	0.53 (1.00)
<i>Region of residence</i>	
Northeast	16.58
North central /Midwest	23.26
South	37.36
West	22.80
<i>Education</i>	
Less than high school	8.92
High school graduate	25.72
1–3 years of college	30.84
+ College graduate	34.52
<i>Household income</i>	
\$0–34,999	32.52
\$35,000–\$74,999	29.33
\$75,000–\$99,999	13.15
\$100,000 and over	25.00
<i>Employment status, last week</i>	
Employed	61.46
Unemployed	17.64
Retired	20.90
<i>Homeownership</i>	
Owned	63.05
Rented or other	36.95
<i>Self-reported health</i>	
Excellent	25.62
Very good	34.05
Good	26.79
Fair	10.42
Poor	3.11
Number of chronic conditions (range 0–8)	0.84 (1.10)
<i>Health insurance coverage status</i>	
Had coverage	90.34
Did not have coverage	9.66
Psychological distress (range 0–24)	2.98 (4.13)
Financial worries (range 6–24)	12.00 (5.16)

Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design

SD = standard deviation

Table 2 OLS regression of psychological distress on financial worries, 2018 National Health Interview Survey (n = 22,682)

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)
Financial worries	0.315*** (0.008)	0.291*** (0.007)	0.257*** (0.007)
Age		– 0.013*** (0.002)	– 0.037*** (0.002)
Female (ref: male)		0.296*** (0.059)	0.367*** (0.056)
Race (ref: White)			
Black		– 0.701*** (0.101)	– 0.811*** (0.096)
Asian/American Indian/Alaskan native		– 0.557*** (0.106)	– 0.594*** (0.102)
Other races		0.744*** (0.224)	0.521* (0.207)
Married or cohabiting (ref: separated, divorced, widowed, or never married)		– 0.472*** (0.066)	– 0.464*** (0.063)
Number of children under 18		– 0.189*** (0.034)	– 0.141*** (0.033)
Region of residence (ref: Northeast)			
North central/ Midwest		0.161 (0.101)	0.096 (0.092)
South		– 0.073 (0.095)	– 0.117 (0.087)
West		0.043 (0.113)	0.077 (0.106)
Education (ref: + college graduate)			
Less than high school		0.020 (0.134)	– 0.365** (0.130)
High school graduate		– 0.089 (0.076)	– 0.292*** (0.074)
1–3 years of college		– 0.083 (0.061)	– 0.276*** (0.059)
Employment status (ref: Unemployed)			
Employed		– 1.852*** (0.100)	– 1.261*** (0.093)
Retired		– 1.283*** (0.121)	– 0.849*** (0.116)
Household income (ref: \$100,000 and over)			
\$0–34,999		0.467*** (0.097)	0.242** (0.092)
\$35,000–74,999		0.089 (0.077)	– 0.060 (0.074)
\$75,000–99,999		– 0.084 (0.080)	– 0.149† (0.077)
Homeowners (ref: renters or others)		– 0.187** (0.070)	– 0.122† (0.067)
Self-reported health			– 0.866*** (0.034)
Number of chronic conditions			0.332*** (0.037)

Table 2 (continued)

	Model 1	Model 2	Model 3
	β (SE)	β (SE)	β (SE)
Had health insurance coverage			0.432*** (0.115)
Constant	- 0.795*** (0.081)	1.782*** (0.184)	5.665*** (0.259)
R-squared	0.155	0.208	0.263
Change of R-squared		+ 0.053	+ 0.055
F-test (p-value)	1690.89 (0.000)	119.83 (0.000)	148.69 (0.000)

Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design

SE = standard errors

* $p < .05$, ** $p < .01$, *** $p < .001$, † $p < .1$

and psychological distress by 0.057 compared to renters or other non-homeowners.

Results stratified by significant moderators are presented in Table 4. The association between financial worries and psychological distress was higher for unmarried individuals ($\beta = 0.284$) than married individuals ($\beta = 0.225$), while it was higher for unemployed individuals ($\beta = 0.329$) compared to employed ($\beta = 0.236$) and retired ($\beta = 0.242$) individuals. Additionally, the association between financial worries and psychological distress decreased as household income increased. Renters or other non-homeowners ($\beta = 0.289$) had a higher association between financial worries and psychological distress relative to participants who owned a home ($\beta = 0.234$). This indicated that marriage, employment, income, and homeownership were protective factors against the negative influence of financial worries on psychological health.

Discussion

Using a nationally representative sample, this study contributes to the literature on the relationships between financial worries and psychological distress among U.S. adults. Our hypothesis that financial worries are positively and significantly associated with psychological distress was supported across all models, which was consistent with prior findings (Hamilton et al., 2019; Tsuchiya et al., 2020; Weissman et al., 2020) and also echoed the stress process and stress coping theories (Lazarus & Folkman, 1984; Pearlin et al., 1981), in which domain stress is proposed to be directly and indirectly associated with short- and long-term life outcomes, such as physical, psychological, and social well-being. Furthermore, this study also found a consistently positive role of financial worries when examining each financial worry item to discover the association with psychological distress.

Furthermore, the study found that the associations between financial worries and psychological distress were more pronounced among individuals who were unmarried, unemployed, had the lowest income level, and did not own a home. On the other hand, we did not find significant moderating effects of gender and education, consistent with two previous studies (Hamilton et al., 2019; Viseu et al., 2019). However, our results contrasted with these two studies in that they did not find significant moderating effects of employment status or income on the association between debt stress and psychological distress. This might be because that we applied a broader measure for financial worries, including not only debt-related worries (such as mortgage and medical bills) but also worries about day-to-day financial expenses. Additionally, variations could be attributed to cultural and economic differences among the countries (Weissman et al., 2020). For example, Viseu et al. (2019) conducted their study during a financial crisis when Portugal experienced a rapid increase in unemployment, debt, and insolvency rates (Portuguese Observatory of Health Systems, 2014). Due to this exceptional economic context, demographic and socio-economic factors might not play significant roles as moderators. This notion implies the need for caution when understanding the relationship between financial worries and mental health, because there could be economic or cultural differences across countries.

While the mechanism behind the moderating effects might be unclear, our findings are consistent with previous literature that examined influential socio-demographic factors for psychological distress. In the results, marriage and cohabitation were found to confer advantages to both financial well-being and mental health: individuals who were married or cohabiting reported lower psychological distress and financial worries than those separated, divorced, widowed, or never married. Several studies have demonstrated that marriage provides benefits to economic well-being (Waite & Lehrer, 2003) and mental health, including

Table 3 Moderating effects for the association between financial worries and psychological distress, 2018 National Health Interview Survey (n=22,682)

	Psychological distress β (SE)	Wald tests of moderating effects
Gender (ref: male)		
Female x Financial worries	0.015 (0.012)	F (1, 485) = 1.44 (p=0.2302)
Marital status (ref: separated, divorced, widowed, or never married)		
Married or cohabiting x Financial worries	- 0.070*** (0.012)	F (1, 485) = 32.43 (p=0.000)
Education (ref: Lower education)		
Higher education x Financial worries	- 0.014 (0.013)	F (1, 485) = 1.16 (p=0.2828)
Employment status (ref: Unemployed)		
Employed x Financial worries	- 0.125*** (0.017)	F (2, 484) = 29.66 (p=0.000)
Retired x Financial worries	- 0.133*** (0.021)	
Household income (ref: \$100,000 and over)		
\$0–34,999 x Financial worries	0.124*** (0.016)	F (3, 483) = 22.51 (p=0.000)
\$35,000–74,999 x Financial worries	0.069*** (0.017)	
\$75,000–99,999 x Financial worries	0.017 (0.020)	
Homeownership (ref: Renters or others)		
Homeowners x Financial worries	- 0.057*** (0.013)	F (1, 485) = 17.94 (p=0.000)

Model controlled for age, gender, race, marital status, number of children in household, region of residence, education, employment status, household income, homeownership, self-reported health, insurance coverage, number of chronic conditions. Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design. Estimates of Wald tests are F-test statistic and associated p-values. The other coefficients are available upon request

SE = standard errors

*** $p < .001$

psychological distress, depression, and psychiatric disorders (Darghouth et al., 2015; Horwitz et al., 1996; Waite & Gallagher, 2000; Williams et al., 2009). One possible causal mechanism is that a spouse can offer practical, emotional, and financial support, which is not immediately available to those not married (Mastekaasa, 2006). On the other hand, the positive association between marriage or cohabitation and psychological distress could be a result of differential selection. Psychologically healthy individuals are more likely to marry, while psychologically unhealthy and unhappy people are more likely to stay unmarried (Forthofer et al., 1996; Mastekaasa, 1992, 2006).

This study found that individuals who were employed, had higher income, and owned a home reported lower psychological distress and financial worries compared to each counterpart on average. This supports social stress theory, which explains that disadvantaged people are more likely to

be exposed to stressors and to be more vulnerable to stress since they have limited psychosocial coping resources leading to a higher risk of mental problems. It has been also well documented that employment, income, and assets are strong protective factors against financial worries as well as psychological distress (Aneshensel, 2009; Caron & Liu, 2011; Cox et al., 2007; Drydakis, 2015; Fukuda & Hiyoshi, 2012; Huang et al., 2009; Hudson, 2005; Jorm et al., 2005; Laaksonen et al., 2009; McKee-Ryan et al., 2005; Pudrovska et al., 2005; Reiss et al., 2019). This relationship arises possibly because individuals with socio-economic disadvantages (1) experience greater physical and mental health problems as they reduce health-promoting behaviors and have less access to healthcare services (Drydakis, 2015; Kawachi & Beckman, 2000; Paul & Moser, 2009; Kawachi & Wamala, 2006); (2) have low awareness of and place low priority on mental health (Patel et al., 2008; Sweetland

Table 4 Stratified analysis – outcome: psychological distress, 2018 National Health Interview Survey (n = 22,682)

By marital status	Married or cohabiting	Separated, divorced, widowed, or never married		
Financial worries	0.225*** (0.009)	0.284*** (0.010)		
N	11,663	11,019		
By employment status	Employed	Unemployed	Retired	
Financial worries	0.236*** (0.009)	0.329*** (0.016)	0.242*** (0.016)	
N	13,545	3,924	5,213	
By household income	\$0–34,999	\$35,000–74,999	\$75,000–99,999	\$100,000 and over
Financial worries	0.293*** (0.011)	0.258*** (0.013)	0.204*** (0.017)	0.195*** (0.013)
N	7,319	6,702	3,051	5,610
By homeownership	Owned	Rented or other		
Financial worries	0.234*** (0.009)	0.289*** (0.011)		
N	14,696	7,986		

Model controlled for age, gender, race, marital status, number of children in household, region of residence, education, employment status, household income, homeownership, self-reported health, insurance coverage, number of chronic conditions. Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design. Standard errors are in parentheses. The other coefficients are available upon request

*** $p < .001$

et al., 2014); and (3) lack access to the proper emotional or financial support and medical treatment to reduce financial strains and psychological distress (Aneshensel, 2009; Fukuda & Hiyoshi, 2012; Hudson, 2005; Laaksonen et al., 2009; Pudrovska et al., 2005; Reiss et al., 2019) compared to those with socio-economic advantages.

Implications

Our findings provide implications for financial practitioners, mental health professionals, and policy makers. First, financial practitioners, such as professionals working as financial planners, advisors, counselors, and/or therapists, should strive to understand the negative relationship between financial worries and mental health. Helping clients to better manage their finances and reduce financial worries and stress can potentially buffer psychological distress. Therefore, financial practitioners should adopt an integrated approach when their clients suffer from mental stress due to financial concerns, while appropriate referrals and collaborations among financial professionals should be fostered. Additionally, more counseling and therapy services that can help reduce financial stress should be customized to target more financially vulnerable populations. Financial practitioners and educators should also help improve their financial literacy and confidence and financial decision-making capability.

For mental health professionals such as psychologists, counselors, or psychotherapists, this study provides a profound understanding of the psychological symptoms that patients experience. It is important for these professionals to be aware of financial worries as a possible contributing factor to mental distress, particularly among individuals such as the unmarried, unemployed, low-income households, and renters. Individuals who suffer from financial hardship should undergo regular psychological distress screenings during their clinic visits. Practitioners also should monitor changes in the objective financial conditions and subjective financial worries in relation to the trends in psychological distress.

The findings of this study underscore the importance of public policies for mental health. According to Mental Health America (2020), 23.6% of U.S. adults with a mental illness reported an unmet need for treatment in 2017–2018, and this number has not declined since 2011. Other than the National Mental Health Act aiming to improve the overall populations' mental health through medical treatments, this study provides an insightful perspective to link financial worries and stress induced by personal and family finances to psychological health. On the other hand, according to Mental Health America, recent and current mental health legislation, such as the Lower Health Care Costs Act, the RISE (Resilience Investment, Support, and Expansion) from Trauma Act, and the Mental Health Parity Compliance Act, could potentially reduce barriers for many households and

individuals to seek mental health care services. Policy makers should place priority on providing accessible and affordable health care services for mental health issues caused by personal financial crises or financial stress.

Finally, public health and policy interventions should be developed and implemented to promote protective factors that decrease the risk of psychological distress following experiences of financial worries. For example, financial education programs and counseling services can enable individuals to learn and develop coping strategies to manage their financial worries. These programs should focus more on providing sufficient resources for and attention to individuals who are especially vulnerable to financially related psychological distress, such as the unmarried, unemployed, low-income households, and renters. Additionally, policy makers might need to consider supporting the unemployed to find a new job to increase income and accumulate assets, which can reduce financial worries and thereby avoid psychological distress.

Limitations

While this study presents new crucial findings on the association between financial worries and psychological distress among U.S. adults and the significant moderators for its relationship, there are some limitations to highlight. The cross-sectional NHIS data did not enable us to examine the causal mechanisms between financial worries and psychological distress. Future studies should explore the effects of financial worries on psychological distress or other mental health indicators using a longitudinal dataset. Furthermore, although several potential confounders were controlled, confounding factors might exist that could affect the estimates of associations. For example, there was no information on the type of assets or debts and financial support from family members. It will be interesting to examine how the association between financial worries and psychological distress differs by the type of assets and debts or level of social support. Additionally, we were unable to examine the underlying mechanism through mediation analysis, mainly because the relevant data were not available. Financial worries could potentially moderate the relationship between objective financial hardship and mental health outcomes, which could be further explored by future studies. More studies are also needed to examine personal and external resources (e.g., mastery and social support) that could also mediate the relationship between financial worries and mental health outcomes.

Conclusion

Using a sample from the nationally representative NHIS data in 2018, this study found a significantly positive association between financial worries and psychological distress among U.S. adults. Moreover, the associations were different by socio-economic characteristics, including marital status, employment status, household income, and home ownership. These findings provide insights for policymakers to effectively develop public health and financial educational programs, particularly focusing on the vulnerable populations. Additionally, financial practitioners and professionals should help their clients navigate ways to better manage their financial needs, be more financially secure, and feel less mentally stressed and worried about financial matters and advise them to receive mental health services if needed. Public health professionals also need to monitor the changes in financial strains for patients who suffer from psychological distress.

Appendix 1: Difference in the mean of psychological distress and financial worries by moderators (n = 22,682), 2018 National Health Interview Survey

By gender	Male	Female	t-test or F-test (p-value)
Psychological distress	2.62	3.30	10.61 (0.000)
Financial worries	11.59	12.37	10.75 (0.000)
By marital status	Married or cohabiting	Separated, divorced, widowed, or never married	
Psychological distress	2.50	3.48	– 16.10 (0.000)
Financial worries	11.80	12.21	– 5.47 (0.000)
By education	Higher education	Lower education	
Psychological distress	2.76	3.41	– 9.40 (0.000)
Financial worries	11.64	12.71	– 13.04 (0.000)
By employment status	Employed	Unemployed	Retired

Psycho-logical distress	2.62	5.03	2.33		288.10 (0.000)
Financial worries	12.30	13.59	9.80		621.86 (0.000)
By household income	\$0–34,999	\$35,000–74,999	\$75,000–99,999	\$100,000 and over	
Psycho-logical distress	4.09	2.91	2.29	2.0	239.20 (0.000)
Financial worries	13.33	12.24	11.13	10.49	252.62 (0.000)
By home-ownership	Owned	Rented or other			
Psycho-logical distress	2.55	3.72			– 16.58 (0.000)
Financial worries	11.33	13.16			– 20.02 (0.000)

***p < 0.001

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Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design

Appendix 2: OLS regression of psychological distress on each item of financial worries (n = 22,682), 2018 National Health Interview Survey

	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)
(1) Felt everything an effort	0.066*** (0.002)	0.060*** (0.002)	0.052*** (0.002)
R-squared	0.102	0.136	0.181
(2) Felt hopeless	0.045*** (0.001)	0.042*** (0.001)	0.037*** (0.001)
R-squared	0.105	0.141	0.166
(3) Felt nervous	0.060*** (0.002)	0.057*** (0.002)	0.051*** (0.002)
R-squared	0.093	0.137	0.168
(4) Felt restless	0.058*** (0.002)	0.053*** (0.002)	0.047*** (0.002)
R-squared	0.075	0.105	0.138
(5) Felt sad	0.051*** (0.001)	0.047*** (0.001)	0.042*** (0.001)
R-squared	0.098	0.151	0.179
(6) Felt worthless	0.036*** (0.001)	0.033*** (0.001)	0.029*** (0.001)
R-squared	0.075	0.112	0.143

Sampling weights were applied to derive nationally representative estimates accounting for the complex sample design. The other coefficients are available upon request

SE = standard errors

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