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Article

Short-term lending: Payday loans as risk factors for anxiety, inflammation and poor health

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ABSTRACT

While research now consistently links consumer financial debt with adverse emotional health outcomes, specific forms of debt and their impact on measures of physical health are underexplored. This gap in knowledge is significant because different forms of loans and debt may have different experiential qualities. In this paper, we focus on a type of unsecured debt - short-term/payday loan borrowing - that has risen dramatically in recent decades in the United States and is characterized by predatory, discriminatory, and poorly regulated lending practices. Using data from a study of debt and health among adults in Boston, MA (n=286), we test whether short-term borrowing is associated with a range of emotional and physical health indicators. We find that short-term loans are associated with higher body mass index, waist circumference, C-reactive protein levels, and self-reported symptoms of physical health, sexual health, and anxiety, after controlling for several socio-demographic covariates. We discuss these findings within the contexts of regulatory shortcomings, psychosocial stress, and racial and economic credit disparities. We suggest that within the broader context of financial debt and health, short-term loans should be considered a specific risk to population health.

1. Introduction

This paper examines payday and other short-term loans as distinct types of consumer debt that may be linked with disease risk. Consumer debt generally has gained recent attention as a socioeconomic variable of interest in population health research. Motivated in part by growing burdens of household debt in much of the world (Anonymous, 2014; Corkery & Cowley, 2017), studies are increasingly finding links between debt and poor health across a range of outcomes, including depression and depressive symptoms (Alley et al., 2011; Bridges & Disney, 2010; Drentea & Reynolds, 2012; Hojman, Miranda, & Ruiz-Tagle, 2016; McLaughlin et al., 2012; Reading & Reynolds, 2001; Sweet, Nandi, Adam, & McDade, 2013; Zurlo, Yoon, & Kim, 2014), anxiety, poor psychological well-being, and other mental disorders (Brown, Taylor, & Price, 2005; Drentea & Reynolds, 2012; Jenkins et al., 2008; Meltzer et al., 2011; Sweet et al., 2013; Walsemann, Gee, & Gentile, 2015; Zurlo et al., 2014), poor self-rated health (Drentea & Lavrakas, 2000; Lau & Leung, 2014; Sweet et al., 2013), high blood pressure (Pollack and Lynch, 2009; Sweet et al., 2013), obesity (Münster, Rüger, Ochsmann, Letzel, & Toschke, 2009), child behavior problems (Berger & Houle, 2016), lower life expectancy (Clayton, Liñares-Zegarra, &

Wilson, 2015), and foregone medical care or care non-adherence (Kalousova & Burgard, 2013; Pollack & Lynch, 2009). While the bulk of available evidence highlights the impact of consumer debt on psychological health (see Richardson et al. for review) (Richardson, Elliott, & Roberts, 2013), recent findings involving measures of physical health are helping to solidify the significance of debt as an important socioeconomic determinant of health (Clayton et al., 2015; Pollack & Lynch, 2009; Sweet et al., 2013).

Questions remain, however, regarding the mechanisms through which debt may impact health and which aspects of debt are most significant. These questions are complicated by the variety of ways in which debt is conceptualized, measured and operationalized in the epidemiological literature. Across studies, consumer debt is assessed as an absolute amount or ratio in relation to income or assets (Berger and Houle, 2016; Clayton et al., 2015; Drentea & Lavrakas, 2000; Hojman et al., 2016; Walsemann, Ailshire, & Gee, 2016), as well as an indebted state (presence or absence of debt, mortgage delinquent, or self-reported debt difficulties) (Alley et al., 2011; Bridges & Disney, 2010; Brown et al., 2005; Drentea & Reynolds, 2012; Jenkins et al., 2008; Lau and Leung, 2014; McLaughlin et al., 2012; Pollack & Lynch, 2009; Reading & Reynolds, 2001; Zurlo et al., 2014). Other measures reflect

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the fact that not all debt is equivalent in terms of its socioeconomic implications. For example, while most debt is viewed as a marker of financial strain, a home mortgage is collateralized (secured) and reflects a pre-requisite level of investment capital and financial stability needed to secure the loan. Home mortgages and other secured loans therefore, unless delinquent, may be better viewed as forms of capital that correlate positively with other socioeconomic indicators than as potentially health damaging debt. Indeed studies have shown that while foreclosure risk is associated with poor health (Alley et al., 2011; Brown et al., 2005; Lau & Leung, 2014; McLaughlin et al., 2012; Pollack & Lynch, 2009), unsecured debt, rather than mortgage debt, tends to be a more reliable predictor of health outcomes (Berger & Houle, 2016; Brown et al., 2005; Clayton et al., 2015; Kalousova & Burgard, 2013; Zurlo et al., 2014).

Beyond the distinction between secured and unsecured debt, it can also be argued that the various forms that debt can take have potentially distinct experiential and health implications. Student loans, for instance, represent a heavy financial burden for new college graduates, but are also (in theory) investments in future earning potential and cultural capital in the form of a college degree. Credit cards are not collateralized and can carry high interest rates and fees, but can also be used to smooth over periods of household financial difficulty or instability. All debts are not equivalent, therefore, nor even necessarily internally coherent, in terms of their socioeconomic meaning and impact. There is thus a strong need to explore in greater depth the different forms that debt can take and the ways in which their meanings and relationships with health may vary.

In this paper, we focus on a form of debt that has been largely excluded from epidemiological investigations thus far – debt from short-term, predatory lending. Also called by the name of their most ubiquitous type, payday loans, short-term loans refer to a range of high-interest, revolving loan mechanisms that disproportionately target poor, minority, elderly, geographically isolated, or other vulnerable borrowers (Austin, 2004). Including loans such as title loans, pawn loans, cash advances, and rapid tax refunds, among others, the general structure of short-term loans are similar in that their compounding fee structures and lump sum repayment models are designed to cost borrowers as much as possible while keeping them in perpetual low-level debt (Austin, 2004; Williams, 2005). Short-term loan profits thrive on the use of extremely high interest rates and fees that are masked by short windows and small initial loan amounts but that accumulate over time through the use of automatic revolving mechanisms. A typical payday loan, for example, will be revolved (or renewed) several times if the original loan cannot be repaid in full at the end of the short (often two-week) initial period, resulting in a borrower ultimately owing on average \$800 for a \$300 loan and paying the equivalent of 400% APR in fees (Logan & Weller, 2009).

Despite their high cost, short-term loans have gained in both popularity and availability in recent years, due in large part to relaxed federal oversight of credit lending practices. While versions of short-term loans and paycheck advances have a long history in the US, state usury laws and interest rate restrictions kept their broad impact largely in check until neoliberal banking and finance legislation began to take root in the 1970s. Aimed at loosening depression-era consumer protection regulations, neoliberal financial policy helped to erode the restrictions that kept credit lenders under tight state-level control and created a fertile environment for the short-term loan industry to flourish (Williams, 2005). Since the 1990s payday loans and their equivalent grew exponentially in the US, serving an estimated 19 million borrowers by the mid-2000s (Logan & Weller, 2009).

Given the predatory and largely unregulated nature of the short-term loan industry, these credit mechanisms have garnered considerable attention from legal and social science scholars, as well as policymakers, as being among the most problematic unsecured debt for the financial health of consumers (Austin, 2004; Johnson, 2002; Logan & Weller, 2009; Williams, 2005, 2008). It is possible that they could be

among the most problematic for psychological and physical health as well. Given the ways in which payday loans trap borrowers into perpetual cycles of high-interest debt, it is likely that these loans are significant sources of stress for those who utilize them. Psychosocial stress is thought to be one of the pathways through which debt more broadly is associated with poor health, particularly considering the strong links between debt and depression reported by many studies (Alley et al., 2011; Bridges & Disney, 2010; Drentea & Reynolds, 2012; Hojman et al., 2016; McLaughlin et al., 2012; Reading & Reynolds, 2001; Sweet et al., 2013; Zurlo et al., 2014).

Furthermore, prior research has posited that unsecured debt may be especially stressful because of its more burdensome interest and repayment structures (Drentea & Reynolds, 2012; Zurlo et al., 2014), and that ‘debt stress’, or worry about being able to pay off what is owed, may be a key mediator linking debt with poor health (Drentea & Reynolds, 2012). The tendency of short-term loan mechanisms to trap borrowers in endless, and often compounding, debt cycles could indeed generate repayment worry and stress that is particularly severe and enduring. Prior qualitative findings from our own study, published elsewhere (Sweet et al., 2018; and Anonymous, In Review), also support this notion. Indebted Boston residents we interviewed described intense feelings of stress, depression, and emotional and physical suffering stemming from their debt and the constant management of household resources that accompanied their efforts to pay it off. For many of these people, payday loans (or their equivalent) were an important part of their debt story; 32% of those we interviewed had taken out payday loans and experienced the “loan shark” repayment practices of short-term lenders as distinctly problematic and “drastic” (Anonymous, In Review). Despite the highly troublesome and potentially stressful nature of payday loans, to our knowledge, only one epidemiological study thus far has explored the health correlates of short-term loan debt (Eisenberg-Guyot, Firth, Klawitter, & Hajat, 2018). In that study, short-term (“fringe”) loan borrowing was associated with higher prevalence of poor self-rated health.

In this paper, we report findings from a study in Boston, MA that explores how varied experiences with debt map onto health, with a focus here on short-term loan debt. In an effort to expand available data on a range of health outcomes, we investigate associations between short-term loans and multiple psychological and biomarker measures of health, including cardiovascular and metabolic risk indicators. We hypothesized that, given their potential to elicit substantial repayment stress, individuals with short-term loan debt would have more adverse indicators of cardiovascular, metabolic, and emotional health in our sample.

2. Materials and methods

2.1. Study design and recruitment

Data come from the quantitative and biomarker arm of a two-phase, mixed-methods study of debt and health in Boston, MA. While an earlier phase of qualitative interviews, reported on elsewhere (Sweet et al., 2018) informed the development of the comprehensive debt questionnaire used in this study, here we focus on data from the quantitative phase (Phase 2, $n=286$), which explored the relationship of debt experiences with self-reported and biomarker measures of health. The overall study objectives for both phases of research aimed to capture the breadth and diversity of debt experiences for Boston area adults, including different types of debts (from payday loans to credit cards, student loans, and home mortgages) and varying burdens of amounts owed. While recognizing that debt from short-term loans is likely to be overrepresented in lower income populations that are disproportionately targeted by these lenders (Logan & Weller, 2009; Williams, 2008), we also wanted to account for the growing reach of financial debt generally into a broader array of American households in recent decades (Anonymous, 2014). As a result, our sampling frame did

not include any restrictions based on economic status and our recruitment procedures aimed to enlist a diverse demographic profile of Boston residents. As such, research participants were drawn from across the Boston area, but with a high percentage coming from Dorchester, the largest and most diverse neighborhood in Boston and home to the city's only major public university. Participants were recruited via advertisements posted in public spaces and on public transportation, and via word of mouth. Eligible participants were between 18 and 64 years of age, were not current employees of the author's university, and spoke fluent English. All potential participants were screened via phone or email to ensure they met eligibility criteria before enrollment and gave informed consent prior to participation. Out of 493 total phone or email inquiries from interested parties, 167 (34%) did not respond to our follow-up communications, 8 (1.6%) were determined to be ineligible upon screening, 19 (3.8%) dropped out before participating, and 13 (2.6%) contacted us after enrollment had ended; this yielded a total sample of 286 participants (58% of all initial contacts).

Data collection consisted of both online and in-person components. Participants completed an online questionnaire consisting of demographic questions, a comprehensive debt questionnaire, and measures of self-reported health. Trained personnel collected participants' biomarker data in a private office at the lead author's institution. To accommodate those without independent internet access, all participants were given the option to complete the online questionnaire portion of the study when they came for their on-campus biomarker appointment. No potential participants declined enrollment due to internet access concerns. All participants were compensated \$50 for their time plus transportation costs at the conclusion of their biomarker appointment. All study procedures were conducted under the conditions of written informed consent and were reviewed for ethical treatment of human subjects and approved by the Institutional Review Board at the lead author's university.

2.2. Measures of short-term loan debt

History of short-term borrowing was measured via participants' self-report (yes/no) of whether they had ever had a short-term loan of any kind, including payday loans, title loans, cash advances, or any other form of short-term loan, excluding borrowing money from family or friends. They also reported if they currently had a short-term loan of any kind and, if so, the amount of the loan in dollars. To better understand the financial contexts motivating participants to take on short-term loans, an additional question asked "what kinds of things have you used short-term loans to pay for?" Response options included food, utilities, education, medical expenses, vacations or leisure activities, personal consumer goods (clothing, technology, etc.), expenses related to children or dependents, and other expenses, and participants were prompted to choose all applicable responses.

2.3. Measures of health

Based on prior qualitative findings (from Phase 1) in which interview respondents described a variety of physical and emotional symptoms arising from their experiences of being in debt, our questionnaire included three separate items assessing self-reported debt-related symptomatology. Specifically, questions asked participants (1) whether they ever "feel any of the following physical symptoms as a result of your debt": headaches, insomnia, loss of appetite, indigestion/heartburn, irritable bowel syndrome (IBS), hives, nausea; (2) whether they ever "feel any of the following emotional symptoms as a result of your debt": depression, anxiety, panic attacks; and (3) whether they ever "feel any of the following sexual symptoms as a result of your debt": low sex drive, high sex drive, erectile dysfunction. For analyses, responses were coded as scores representing a count of the number of symptoms reported for each of the three separate questions.

Participants also completed several validated, Likert-type scales

measuring aspects of emotional and psychological health. Depressive symptoms were measured by the 20-item Center for Epidemiologic Studies Depression (CES-D) scale (Radloff, 1977), which asks respondents how frequently they experienced a set of feelings and behaviors in the past week, including being "bothered by things that don't usually bother me," having "trouble keeping my mind on what I was doing," thinking "my life had been failure," and feeling lonely. Symptoms of anxiety were measured using the 21-item Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988), which asks respondents how much they have been bothered by a range of symptoms in the past month, including numbness or tingling, being unable to relax, fearing the worst happening, and experiencing heart pounding or racing. Perceived stress was measured using Cohen's 10-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983). Questions ask respondents how often they have felt a certain way in the last few months, including having "been upset because of something that happened," "felt that you were unable to control the important things in your life," and "felt nervous or stressed." For each scale, a composite summary score was constructed following standard scoring procedures, with positively worded items reverse-coded.

Trained research personnel measured systolic and diastolic blood pressures (SBP and DBP) using an automated device. After an initial seated resting period of at least 10 minutes, three separate readings were taken. As expected, the first reading was, on average, significantly higher than the second and third readings (117.3/80.3 vs. 113.7/78.4 and 113.2/77.5), so only the second and third readings are averaged and used in analyses. Additional measures of cardiovascular and metabolic disease risk included anthropometric assessments of body composition. Waist circumference was measured to the nearest cm at the location participants indicated represented their natural waist. After participants removed their shoes, height was measured to the nearest 0.1 cm using a Seca 213 stadiometer. Weight was measured to the nearest 0.1 pounds using a Tanita digital scale. Body mass index (BMI) was computed as weight (kg)/height (m)².

C-reactive protein (CRP) levels and Epstein-Barr virus (EBV) antibodies were assessed from dried blood spot (DBS) samples, collected on filter paper using minimally-invasive finger-prick protocols (McDade, Williams, & Snodgrass, 2007). As a non-specific inflammatory marker, elevated CRP is a general risk factor for cardiovascular disease and is associated with psychosocial stress, while EBV antibodies represent an indirect measure of cell-mediated immune function that is also correlated with chronic stress (Herbert & Cohen, 1993; McDade et al., 2007; McEwen, 2004). CRP and EBV antibodies were quantified with standard high-sensitivity enzyme-linked immunosorbent assay (ELISA) procedures (McDade, Burhop, & Dohnal, 2004; McDade et al., 2000). In statistical analyses, CRP was multiplied by 1.64 to generate plasma equivalent values and log-transformed to correct for skew (McDade, 2014). Five individuals with CRP values higher than 10 (indicating acute infection) were dropped from analyses (Pearson et al., 2003). EBV values were also log-transformed prior to analysis, and sixty-three individuals with EBV antibodies less than 20 (seronegative) were dropped from analyses (McDade et al., 2000). Removing seronegative individuals from the analyses is important because EBV antibodies provide insight into cell-mediated immunity only for individuals with prior exposure to EBV.

2.4. Demographic and covariate measures

Respondents self-reported their age in years, gender (male, female, or transgender), relationship status (single, in a relationship, married, widowed, divorced, or separated), highest level of education completed (none, primary or middle school, high school or GED, vocational or technical school, some college, college degree, graduate degree), whether they were currently employed, whether they were currently a student, whether they currently received any form of public assistance or welfare, their total personal income for the previous year (reported on a categorical

Table 1
Sample Demographics for total sample and by short-term loan (STL) history, Mean (Std. Dev.) or % (Freq.).

	Total Sample (n = 286)	No History of STL (n = 224)	History of STL (n = 62)	p-value
Age	31.7 (12.8)	30.3 (21.1)	37.0 (13.8)	0.00
Female	54.2% (155)	56% (123)	49% (30)	0.33
Married	11.5% (33)	10.3% (23)	16.1% (10)	0.20
Education				0.40
Primary or Middle	0.7% (2)	0.5% (1)	1.6% (1)	
High School or GED	12.6% (36)	12.5% (28)	12.9 (8)	
Tech or Vocational	1.75% (5)	2.2% (5)	0% (0)	
Some College	22.4% (64)	22.3% (50)	22.6% (14)	
Associates Degree	4.2% (12)	2.2% (5)	11.3% (7)	
Bachelor's Degree	37.7% (108)	37.5% (84)	38.7% (24)	
Graduate Degree	20.6% (59)	22.7% (51)	12.9% (8)	
Employed	67.5% (193)	68.3% (153)	64.5% (40)	0.57
Student	46.2% (132)	46.4% (104)	45.2% (28)	0.86
Welfare	18.9% (54)	16.5% (37)	27.9% (17)	0.05
No health insurance	5.2% (15)	5.4% (12)	4.8% (3)	0.87
Hispanic	6.3% (18)	6.3% (14)	6.4% (4)	0.96
Race				0.00
Am. Indian or	0.35% (1)	0.5% (1)	0% (0)	
Al. Nat.	17.9% (51)	17.5% (39)	19.3% (12)	
Asian	17.2% (49)	13% (29)	32.3% (20)	
Black or African	55.1% (157)	60.5% (135)	35.5% (22)	
American	6.3% (18)	4.9% (11)	11.3% (7)	
White	3.2% (9)	3.6% (8)	1.6% (1)	
Multiple Race				
Other				
Income	\$25,106 (28,576)	\$24,671 (28,355)	\$26,680 (29,551)	0.63
Less than \$5000	28.4% (80)			
\$5000–9999	15.2% (43)			
\$10,000–14,999	11.3% (32)			
\$15,000–19,999	4.2% (12)			
\$20,000–24,999	4.2% (12)			
\$25,000–29,999	6.0% (17)			
\$30,000–39,999	7.1% (20)			
\$40,000–49,999	8.2% (23)			
\$50,000–74,999	8.2% (23)			
\$75,000–99,999	4.6% (13)			
\$100,000–149,999	2.1% (6)			
\$150,000 or more	0.3% (1)			
Short-term Loan Ever	21.7% (62)			
Payday	5.6% (16)			
Title	1% (3)			
Cash Advance	4.9% (14)			
Other	5.9% (17)			
Short-term Loan Currently	2.7% (8)			
Short-term Loan Amount, if current	\$2900 (5198)			

*p < 0.05 for difference by short-term loan history

scale ranging from 1 = “less than \$5000” to 12 = “\$150,000 or more,” with responses recoded to the mid-point dollar value of each category for ease of interpretation), how their medical care was primarily paid for (self or out-of-pocket, Medicaid, Insurance), how they would describe their race (American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Pacific Islander, White, Multiple Race, or Other), and whether they consider themselves to be of Hispanic or Latino ethnicity.

2.5. Analysis strategy

Because the number of participants reporting current short-term loans was relatively small (n=8, see Table 1), analyses focused on comparing those with a history of ever having had a short-term loan to those who had never had one. Using a p-value of 0.05 as a cut-off, statistically significant differences in demographic and health characteristics between those with and without a history of short-term loans were tested using t-tests for continuous parameters and chi-square tests for categorical variables. Separate multiple regression models were used to assess whether short-term loan history was associated with each of the 12 health outcomes (SBP, DBP, BMI, waist circumference, CRP, EBV, physical symptoms, emotional symptoms, sexual symptoms,

depression, anxiety, perceived stress), controlling for potential confounders and covariates. Model 1 tests basic associations between short-term loan borrowing and health outcomes, with no added control variables. In Model 2, those demographic and socioeconomic variables that showed a statistically significant difference across short-term loan history (age, welfare receipt, and race – see Table 1) were included as potential confounders. In Model 3, a wider range of theoretically potential confounders was included, in addition to those from Model 1

Table 2
Uses of short-term loans.

Use Category	% (Frequency)
Food	54% (33)
Housing	49% (30)
Utilities	41% (25)
Personal goods	38% (23)
Education	21% (13)
Vacation	21% (13)
Medical expenses	15% (9)
Child or dependent expenses	13% (8)

Table 3
Health Measures for total sample and by short-term loan history, Mean (Std. Dev.) or % (Freq.).

	Total Sample (n = 286)	No History of Short-term loans	History of Short-term loans	p-value
Systolic blood pressure	113.4 (15.7)	111.5 (14.8)	120.2 (16.9)	0.001
Diastolic Blood pressure	77.9 (10.8)	76.8 (10.0)	82.3 (12.2)	0.001
BP Medication	4.2% (12)	2.2% (5)	11.3% (7)	0.001
BMI	26.2 (5.7)	25.5 (5.4)	28.4 (6.1)	0.001
Waist circumference	86.7 (16.1)	84.9 (16.1)	93.1 (14.5)	0.001
CRP (median mg/L)	0.8 (3.2)	0.6 (3.2)	1.2 (3.4)	0.01
EBV (median)	97.5 (241.1)	106.7 (258.5)	83.8 (157.1)	0.32
# Physical symptoms	1.1 (1.4)	0.9 (1.3)	1.5 (1.8)	0.01
# Emotional symptoms	1.1 (1.0)	1.0 (1.0)	1.3 (1.1)	0.11
# Sexual Symptoms	0.3 (0.5)	0.2 (0.4)	0.5 (0.7)	0.001
Depression	17.5 (10.7)	17.0 (10.4)	19.5 (11.7)	0.13
Anxiety	12.2 (10.6)	11.5 (10.5)	14.4 (10.7)	0.07
Perceived Stress	18.6 (5.6)	18.5 (5.6)	19.0 (5.7)	0.51

(gender, education, income, student status, health insurance status, marital status, employment status, and Hispanic ethnicity). All models with systolic or diastolic blood pressure as the dependent variables also controlled for the use of anti-hypertensive medications, and all models with CRP as the dependent variable also controlled for BMI.

3. Results

3.1. Sample characteristics

Demographic data are shown for the total sample, and separately by short-term loan history, in Table 1. The mean age of participants was just under 32 years, and ages ranged from 18 to 65. Just over half of the sample was female, and just under half were single. The majority of the sample was employed and very few were without health insurance (5%). The sample contained a relatively high portion of current students (46%), which is unsurprising given the high concentration of institutions of higher education in the Boston area and that the study was conducted near university areas. Participants most commonly identified their race as White, Asian, and Black or African American. The majority of the sample had incomes below \$20,000 per year.

Just under 22% of the sample (n=62) had a history of short-term loan borrowing (had ever had a short-term loan of any type). Only 8 people (2.7% of the sample) had a current short-term loan, and the average amount owed on those current loans was \$2900. The most common uses of short-term loans were paying for essential living expenses like food, housing, and utilities (see Table 2). Only three demographic characteristics differed significantly between those with a history of short-term loans and those without: age, welfare receipt, and race. Those with a history of short-term borrowing were older (mean age 37 vs. 30), more likely to receive public assistance or welfare benefits, and more likely to report their race as Black or African American, or as Multiple Race.

3.2. Health characteristics

Table 3 describes health characteristics for the total sample, and separately by short-term loan history. In general the overall sample is quite healthy. Average systolic and diastolic blood pressures for the total sample were within normal ranges. Mean BMI in our sample was 26.2, which is above the “normal weight” threshold of 24.9, however only 19.2% of our sample falls into an obese category (BMI of 30 or higher). Median plasma-equivalent CRP was 0.8, which is well below the 3 mg/L threshold indicating increased cardiovascular disease risk. The median EBV antibody value was 97.5, which is somewhat lower than that reported in the nationally-representative AddHealth sample

(Dowd, Palermo, Chyu, Adam, & McDade, 2014). The overall sample reported relatively low numbers of debt-related physical, sexual, and emotional symptoms. Scores on the CES-D and Beck Anxiety Inventory were comparable to validation samples, while perceived stress scores were somewhat high (18.6 vs. 13.0 for this age group in a national sample) (Cohen et al., 1983).

Those with a history of short-term loans had significantly worse health across a range of measures, including higher systolic blood pressure, higher diastolic blood pressure, higher BMI, higher waist circumference, higher CRP, and higher total counts of debt-related physical and sexual health symptoms. Debt-related emotional symptom counts and scores on the validated scales of depression, perceived stress, and self-esteem were not significantly different between those with and without a history of short-term loans. Scores on the Beck Anxiety Inventory were statistically borderline elevated ($p < 0.07$) among individuals with a short-term loan history.

3.3. Multiple regression results

In multiple regression models testing the associations between short-term loans and health outcomes, having a history of short-term loans was significantly associated with most health measures, even when controlling for potential confounders (see Table 4). In unadjusted models, short-term loan borrowing was associated with higher systolic and diastolic blood pressure, BMI, waist circumference, CRP values, number of reported physical and sexual symptoms, and modestly higher anxiety. After adjusting for the three demographic characteristics that differed by short-term loan history – age, welfare receipt, and race – coefficients of association with short-term loan borrowing were somewhat attenuated for systolic (35% reduction) and diastolic blood pressure (48% reduction), and waist circumference (33% reduction), but were virtually unchanged for all other health outcomes. Similarly, in Model 3, controlling for the full set of potential demographic covariates, associations of short-term loan borrowing with SBP, DBP and waist circumference saw further modest attenuation, but the majority of associations remained unchanged and statistically significant. Fig. 1 summarizes these effect sizes, showing the differences between short-term loan borrowers and non-borrowers for key health indicators. The percent difference between the two groups for each health indicator is based on predicted values from the fully adjusted multiple regression model (Model 3). The largest effect sizes are seen for CRP and self-reported symptoms.

4. Discussion and conclusions

In this sample, we found that individuals who had a history of short-term loan borrowing had worse health across a range of cardiovascular, metabolic, and general health indicators. In particular we found that short-term loans are associated with higher blood pressure, adiposity, inflammation, and self-reported adverse physical symptoms. These findings contribute to growing epidemiological evidence that consumer financial debt is linked not only with poorer psychological health but also with poorer physical health (Clayton et al., 2015; Pollack & Lynch, 2009; Sweet et al., 2013), and we expand the list of physical health measures to include markers of body composition and inflammation (CRP). Furthermore, our findings advance knowledge about how diverse forms of indebtedness are associated with health. While previous studies have demonstrated that unsecured debt is distinct from collateralized home loans as a risk factor for poor health (Berger and Houle, 2016; Drentea & Lavrakas, 2000; Sweet et al., 2013; Zurlo et al., 2014), our findings deepen that distinction by contributing to evidence that short-term loans are a specific type of unsecured debt with implications for health (Eisenberg-Guyot et al., 2018).

The magnitude of the relationship between short-term loan borrowing and several of the outcomes that we observed was substantial. The differences in both systolic and diastolic blood pressures between

Table 4

Multiple regression models testing association of short-term loan history with health outcomes, adjusting for covariates, *Unstandardized regression coefficients and 95% CI.*

	Model 1		Model 2 ^a		Model 3 ^b	
	(95% CI)	p-value	(95% CI)	p-value	(95% CI)	p-value
<i>Systolic blood pressure*</i>	6.8 (2.6, 11.1)	0.00	4.3 (0.3, 8.3)	0.04	3.2 (-0.6, 6.9)	0.09
<i>Diastolic blood pressure*</i>	4.2 (1.2, 7.1)	0.01	2.2 (-0.6, 5.0)	0.12	1.8 (-1.1, 4.6)	0.22
<i>BMI</i>	2.8 (1.2, 4.4)	0.00	2.2 (0.6, 3.7)	0.01	2.2 (0.5, 3.8)	0.01
<i>Waist circumference</i>	8.1 (3.6, 12.6)	0.00	5.4 (0.9, 9.9)	0.02	4.7 (0.7, 8.7)	0.02
<i>Log CRP</i>	0.5 (0.1, 0.9)	0.01	0.5 (0.1, 0.9)	0.02	0.5 (0.1, 0.9)	0.02
<i>Log EBV</i>	-0.2 (-0.5, 0.2)	0.29	-0.2 (-0.6, 0.1)	0.17	-0.3 (-0.6, 0.1)	0.15
<i># Physical symptoms</i>	0.5 (0.1, 1.0)	0.01	0.4 (-0.0, 0.9)	0.05	0.6 (0.1, 1.0)	0.01
<i># Emotional symptoms</i>	0.2 (-0.0, 0.5)	0.11	0.2 (-0.1, 0.5)	0.21	0.3 (-0.1, 0.6)	0.11
<i># Sexual symptoms</i>	0.3 (0.1, 0.4)	0.00	0.3 (0.1, 0.4)	0.00	0.3 (0.1, 0.4)	0.00
<i>Depression</i>	2.5 (-0.7, 5.7)	0.13	2.3 (-1.1, 5.6)	0.18	2.3 (-1.3, 5.8)	0.21
<i>Anxiety</i>	2.8 (-0.2, 5.9)	0.07	3.7 (0.4, 6.9)	0.03	3.6 (0.3, 6.9)	0.03
<i>Perceived stress</i>	0.5 (-1.1, 2.2)	0.51	0.8 (-0.9, 2.5)	0.34	1.1 (-0.6, 2.8)	0.21

^a Adjusted for age, welfare, receipt, race (covariates not shown)

^b Adjusted for gender, education, income, student status, health insurance status, marital status, employment status, and Hispanic ethnicity, in addition to Model 1 covariates (covariates not shown).

* Models also control for anti-hypertensive medication usage.

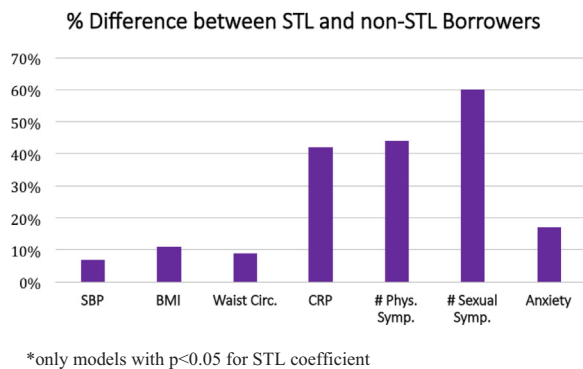


Fig. 1. % Difference in predicted values of key health indicators between short-term loan borrowers and non-borrowers (adjusted for covariates in Model 3)*. *only models with $p < 0.05$ for STL coefficient.

STL borrowers and non-STL borrowers, for instance, were almost double those observed in prior research exploring the effect of overall subjective debt status on blood pressure (Sweet et al., 2013). Similarly, the STL difference we observed in BMI of approximately 3 units is considerably higher than the 1–1.5 unit disparities seen between low and high-income groups in the NHANES, NHIS, and BRFSS datasets (Grabner, 2012), and the magnitude of difference in waist circumference (4.7 cm adjusted difference between STL and non-STL) far exceeds the black-white disparities observed in the NHANES sample (2.2 cm for women and 3.5 cm for men) (Heymsfield, Peterson, Thomas, Heo, & Schuna, 2016). The mean adjusted CRP value of 1.16 mg/L among short-term loan borrowers is particularly dramatic – it is not only 42% higher than that of non-borrowers (whose mean adjusted value is 0.73 mg/L), but indicates that group is in the “intermediate risk” category for heart disease (defined as $CRP > = 1$ and < 3). Together, these findings suggest that short-term loan borrowing is a meaningful socioeconomic risk factor, and that it has substantive implications for health and well-being that are in line with or greater than those of other social and economic determinants.

The magnitude of potential risk that short-term loans pose for public health is amplified by current trends toward continued deregulation. While the newly created Consumer Financial Protection Bureau (CFPB) was working to exert greater federal regulatory control over payday lending in recent years (Anonymous, 2017a), close relationships between the payday industry lobby and the Trump administration and restructuring of CFPB priorities under the Trump White House have

eroded those efforts (Rappeport, 2018). Meanwhile, state level oversight has been mixed and payday lenders are adept at finding loopholes in state laws attempting to limit the industry’s predatory tactics (Guo, 2015). This has resulted in dramatic state-level variation. In Ohio and Texas, where the presence of payday lenders is quite strong, typical APRs are 677% and 662% respectively (Anonymous, 2017b), while other states have had more success capping interest rates or restricting the number of times a loan can be revolved. Massachusetts, where our study was conducted, is one of several states where payday and other short-term loans are highly regulated, with tight restrictions on interest rates and loan amounts and requirements that lenders be licensed with state agencies (Massachusetts, 2005). However, even in these places unlicensed online lenders, which can appear or disappear rapidly and change names and web addresses frequently to evade monitoring, mean that unregulated predatory payday loans are still readily available and their potential to impact health remains widespread.

Furthermore, the way in which short-term lenders structure their predatory practices mean that these loans may not only have negative impacts on health, but are likely to target specific groups in a fashion that could worsen social disparities in health. One of the most troubling aspects of payday lenders is their consistent strategy of targeting the most vulnerable consumers, especially those with limited credit and banking options (Williams, 2005). Their exploitation of military personnel and families living near active bases prompted increased protections under the Military Lending Act of 2006, but other vulnerable groups have not been as fortunate. In states that allow payday storefronts, these outlets cluster in poor and minority neighborhoods where they can be seen to participate in a general devaluation of these communities (Williams, 2008). Proponents of payday loans argue that they serve a critical function as a credit option for otherwise financially neglected, high-risk consumers, but as high-interest credit traps they often do more to create risk than alleviate it (Austin, 2004). As such, payday loans contribute to the broader process of “unbanking” of the poor, in which financial institutions reserve prime credit options for preferred markets while denying loans or charging higher interest to minority and low-income borrowers, irrespective of credit history. In poor and minority neighborhoods, financial institutions replace mainstream banking facilities with short-term loan subsidiaries (Baradaran, 2015; Williams, 2008), and major bank branches offer payday loan equivalents, but preferentially target low-income and minority clients (Silver-Greenberg & Protess, 2012).

Given the social disparities in predatory short-term lending in the broader population, it is possible that short-term loan debt is a proxy for more general states of financial hardship, and that this is the real driver

of observed associations with health. In our sample, short-term loan borrowing was correlated with certain socioeconomic factors (receiving welfare benefits), but not others (education, employment, and income), suggesting that it is not always as direct a proxy of social disadvantage as we might assume. Given the highly discriminatory practices of the payday industry and the targeting of short-term loans to minority consumers, it is also possible that social and economic factors related to race drive the pattern of findings that we observed. Indeed, in our sample, having a history of short-term loans was more common among those who identified as Black or African American. In our analyses we partially accounted for these associations and their potential confounding influence by controlling for these and other socioeconomic factors. We found that including these covariates only modestly attenuated relationships between short-term loans and health outcomes, suggesting that race and financial strain do not completely account for the associations. However, there could still be unmeasured socioeconomic factors that influence or explain the relationship of short-term borrowing with health and additional studies are needed to establish causal impact with greater confidence.

Psychosocial stress resulting from short-term loan borrowing and the abusive repayment terms that accompany them remains a likely explanation for their association with poor health. However, in our sample having a history of payday loans was not associated with most of the psychological outcomes we examined, including depression, perceived stress, and debt-related emotional symptoms. Short-term loans were modestly associated with anxiety in our sample, suggesting that this could serve as a psychological mediator of associations with physical health measures. Future research should explore this potential mediating pathway in more detail, in addition to other potential mechanisms. It is possible, for instance, that the psychological experience of short-term loan borrowing is not well captured by the measures we used and manifests more in adverse health behaviors, neglected medical care, or directly embodied experiences. Prior studies have found foregone medical care to result from indebtedness and this could certainly be a factor associated with carrying short-term loans (Kalousova & Burgard, 2013; Pollack & Lynch, 2009). The fact that body composition measures were particularly strongly correlated with short-term loans in our study suggests that poor health behaviors could be an important mediating pathway.

Furthermore, findings from the earlier qualitative phase of this study show that embodied experiences, including idiomatic sensations like sinking ‘in quicksand’ and physical symptoms of pain, aging, and chronic suffering, are quite significant in the overall cognitive experience of indebtedness (Sweet et al., 2018). Our interview respondents frequently evoked bodily sensations such as drowning and feeling “stifled” in their descriptions of what it felt like to be in debt, and many directly attributed their struggles with headaches, hypertension, and other chronic health issues to the physical toll of living with debt. In light of that, our findings here from the quantitative phase of the study that short-term loan debt correlates with higher debt-related physical and sexual, rather than emotional, symptoms is not entirely surprising. It could be that physical pain and suffering are primary ways in which the financial and psychosocial trauma of short-term loan debt is experienced.

Building on much of the literature on debt and health, we have assumed that being in debt creates a psychosocial or financial environment that leads to poor health, but reverse causation is another and not mutually-exclusive possibility. Medical expenses are a leading cause of indebtedness (Cutshaw, Woolhandler, Himmelstein, & Robertson, 2016; Garcia & Rukavina, 2010; Houle & Keene, 2015; Keene, Lynch, & Baker, 2014), and existing medical conditions and health problems could certainly precede and/or precipitate short-term debt accrual. Indeed a recent study found that mounting medical bills are associated with increased payday lending (Bickham & Lim, 2015), while Medicaid expansion in California has been associated with significant decreases in payday borrowing (Allen, Swanson, Wang, &

Gross, 2017). Reciprocal effects could also be at play, with the stress of payday borrowing to cover medical expenses exacerbating existing health conditions or leading to new health problems.

These issues of reverse causation and reciprocal effects are just some of the ways that the cross-sectional nature of our study limits our findings. In addition to being unable to discern directions of causality, we are unable to investigate time lags in observed effects or other issues related to the timing of borrowing in relation to either acute or chronic emotional and physical health problems. Additionally, since the number of current short-term loan holders in our sample is quite small, our measure of having a history of short-term loan borrowing primarily captures individuals who have ever had these loans in the past. As such, we do not know the amounts or durations of these loans, both of which could be important factors in whether and how short-term loans impact health. We also do not know the chronicity of the health measures we assessed or their timing in relation to past short-term loan use. Additional research is clearly needed to fully sort out these issues.

In addition to the lack of longitudinal data, our study is also limited by its modest, restricted-location sample that limits generalizability to the broader population. The Boston area is remarkably diverse and serves the broad goals of our community-based mixed methods research project extremely well (namely, exploring a variety of debt experiences and health effects in a diverse sample). However, payday and other short-term loans had a relatively low occurrence in our sample, especially among current borrowers. A more focused examination of short-term borrowing and its relationship with health in a location with a higher prevalence of this form of debt would be helpful. In particular, research comparing these relationships across states with varying degrees of regulatory control over the payday industry would help to shed light on the nature of the relationship between short-term loans and health.

Despite our study’s limitations, we believe that our findings are useful in providing initial evidence for potential health impacts of short-term loans. While policy makers grapple with the financial health risks posed by payday borrowing, our findings suggest that these predatory loans could be considered public health risks as well. Furthermore, our findings reinforce the need for research to more fully unpack consumer debt as a socioeconomic variable. Just as “socioeconomic status” more broadly has benefitted from re-examination as a multidimensional material and symbolic construct (Braveman et al., 2005; Sweet, 2011), “debt” also needs to be recognized as a heterogeneous category. Dissecting the variety of forms that debt can take and the ways in which these may map differently onto health will do much to advance our general understanding of debt as a risk factor for poor health.

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None.

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