Published in final edited form as:

J Gay Lesbian Ment Health. 2020 ; 24(3): 308–321. doi:10.1080/19359705.2019.1688217.

High financial hardship and mental health burden among gay, bisexual and other men who have sex with men

Yazan A. Al-Ajlouni^a, Su Hyun Park, PhD, MPH^a, Steven A. Safren, PhD^b, Noah T. Kreski, BA^a, Brian Elbel, MPH^{a,c}, Andrew Trinidad, BA^a, Denton Callander, PhD^a, Dustin T. Duncan, ScD^a

^aDepartment of Population Health, New York University School of Medicine, New York, New York, USA;

^bDepartment of Psychology, College of Arts and Sciences, University of Miami, Miami, Florida, USA;

^cSchool of Public Service, New York University Wagner, New York, New York, USA

Abstract

Prior research has documented the ways in which financial hardships negatively impact health, particularly mental health. However, this association between financial hardships and mental health outcomes has rarely been examined in sexual minorities. The purpose of this study was to examine associations between financial hardships and mental health burdens among a sample of gay, bisexual and other men who have sex with men (MSM) in Paris, France. Participants ($n = 580$) completed a cross-sectional survey advertised on a geosocial networking application. Participants responded to measures of mental health, financial hardship, and socio-demographics. Modified Poisson models were used to estimate risk ratios (RRs) and 95% confidence intervals (CI) for the associations between financial hardship and the following outcomes: 1) depressive symptoms, 2) anxiety symptoms, and 3) psychological distress. After adjusting for socio-demographics, high financial hardships were associated with depressive symptoms (aRR: 1.48, 95% CI: 1.04, 2.11) and psychological distress (aRR: 1.56, 95% CI: 1.09, 2.23). Analyses also demonstrated that stress acts as a mediating variable. These preliminary results suggest that future interventions to reduce financial hardships may have positive effects on the mental health of such a population.

Keywords

Mental health; depression; gay men; sexual minority

Introduction

Research has examined the role of financial hardship on health outcomes (Abel et al., 2016; Ayala, Bingham, Kim, Wheeler, & Millett, 2012; Chi & Tucker-Seeley, 2013; Lynch,

Kaplan, & Shema, 1997; Tucker-Seeley, Harley, Stoddard, & Sorensen, 2013; Tucker-Seeley, Li, Subramanian, & Sorensen, 2009), including emerging research among gays, bisexuals and other men who have sex with men (MSM) (Duncan, Park, Al-Ajlouni, et al., 2017; Duncan, Park, Schneider, et al., 2017; Park et al., 2018). The link between economic hardship and poor health is well-documented, providing evidence that individuals with low incomes are disproportionately affected by negative social and psychological conditions and have limited access to resources (Lynch et al., 1997). There is growing evidence showing that sustained financial hardship and consequences such as debt, unemployment, and decreased living standards among the general population can lead to reduced cognitive functioning and other negative mental health outcomes (Christodoulou & Christodoulou, 2013; Jenkins et al., 2008; Lynch et al., 1997). While there is existing research linking financial hardship and mental health conditions among the general population, little research has examined associations between financial hardship and mental burden among sexual minorities, who may experience financial hardship due to increased social and work-place discrimination (Arabsheibani, Marin, & Wadsworth, 2007; Badgett & Frank, 2007).

Studies show that sexual minorities are particularly vulnerable to mental health disorders, with individuals who have same-sex partners being more likely to meet criteria for psychiatric disorders than individuals who have opposite-sex partners (Chae et al., 2010). The mental health disparity and increased risk for psychological distress may be explained by increased experiences of stress from one's social environment derived from a minority status (Meyer, 1995). Meyer (1995) studied the effect of minority stress on mental health of gay men, and found that internalized homophobia, expectations of stigma, and actual events of discrimination predict psychological distress in gay men. One study exploring workplace discrimination faced by sexual minorities found that the 15% of their sample population reported experiencing workplace discrimination at least once and were also more likely to report poorer health outcomes, including mental health (Bauermeister et al., 2014). As it pertains to financial hardship, sexual minorities are constantly at risk of experiencing minority stress in the form of workplace discrimination, which may impede financial growth and place them at a social disadvantage (Bauermeister et al., 2014). Limited economic resources can also limit access to important sources such as mental health support, especially for sexual minorities (Bauermeister et al., 2014).

In this study, we examined financial hardship and mental health burden among a sample of gay, bisexual, and other MSM in Paris, France. Research shows increased rates of depression and suicide among the general population in European countries facing financial hardship (Karanikolos et al., 2013). Extending the current literature on financial hardship and mental health among a minority population is extremely valuable, given that according to the stress process model, stressful events due to financial hardship and minority status are associated with emotional, psychological, and behavioral responses (e.g., depression and distress). Therefore, such populations, especially those vulnerable to economic hardship, may be at increased risk of mental health issues (Katerndahl & Parchman, 2002; Tucker-Seeley, Mitchell, Shires, & Modlin, 2015). Therefore, seeking to extend the current limited research, we hypothesized that financial hardship will also be related to decreased mental health among gay, bisexual, and other MSM in Paris, due in part to increases in stress, and other pathways.

Methods

Recruitment and study sample

In this investigation, researchers used a popular geosocial networking application (app) for gay, bisexual, and other MSM to recruit for a 52-item survey via a broadcast advertisement in Paris, France. The study's broadcast advertisement was shown for three consecutive 24-hour periods in October 2016. In French, the ad read "Cherchez-vous à améliorer votre santé, et celles dans votre communauté? Partagez vos pensées avec nous sur la santé des hommes gay et bisexuelles, pour une chance de gagner 65€ Cliquez ici pour commencer!" and in English, "Looking to improve your health, and the health of those in your community? Share your thoughts with us on gay and bisexual men's health and have a chance to win €65! Click more to get started!" Users encountered the ad upon logging into the application for the first time in a 24-hour period, and those who chose to participate were redirected to a website that included the survey. Measures were taken to avoid having participants respond multiple times, such as using the "Prevent Ballot Box Stuffing" feature on Qualtrics.

The survey was composed in English and translated to French using a model known as "translate, review, adjudicate, pretest, document" (TRAPD) (Harkness, van de Vijver, Mohler, & Wiley, 2003). Three native French speakers carried out individual forward translations of the English version of the survey, and then a fourth native French speaker compared and integrated these translations into a single version. Finally, a back translation of the survey was conducted by a fifth French speaker to test it for accuracy. Of the 5,206 users that clicked on the advertisement and reached the landing page of the survey, 580 went on to complete the survey. This represents a completion rate of 11.1%. The survey was presented in both French and English; 94.3% of respondents took the survey in French. On average, the survey took 11.4 minutes ($SD = 4.0$) to complete. All protocols were approved by the New York University School of Medicine Institutional Review Board prior to any data collection. All respondents reported being at least 18 years old at the time of survey administration.

Financial hardship

This study assessed financial hardship with the previously used question, "How difficult is it for you to meet monthly payments on bills?" (Tucker-Seeley et al., 2015). Response options included: "Not at all difficult"; "Not very difficult"; "Somewhat difficult"; "Very difficult"; and "Extremely difficult." In line with prior research (Tucker-Seeley et al., 2015), we dichotomized this variable into high financial hardship (Somewhat difficult; Very difficult; and Extremely difficult) and low financial hardship (Not at all difficult and Not very difficult). Moreover, we created a trichotomous variable: high financial hardship ("very difficult" and "extremely difficult"), medium ("somewhat") and low ("not at all difficult" and "not very difficult").

Depressive symptoms, anxiety symptoms and psychological distress

The four-item Patient Health Questionnaire (PHQ-4) was used to measure depression, anxiety and other forms of psychological distress (Kroenke, Spitzer, Williams, & Lowe,

2009). The PHQ-4 consists of two subscales. The Patient Health Questionnaire-2 (PHQ-2) for depressions and the Generalized Anxiety Disorder Scale (GAD-2) for anxiety. Participants were asked the following question: “Over the last two weeks, how often have you been bothered by the following problems?” The problems for depression were: “Feeling down, depressed, or hopeless” and “Little interest or pleasure in doing things.” The problems for anxiety were: “Feeling nervous, anxious, or on edge” and “Not being able to stop or control worrying.” Response options for all were: “Not at all”; “Several days”; “More than half the days”; and “Nearly every day.” These were rated on a 4-point scale from 0 to 3 (with a range of to 6). The PHQ-2 and GAD-2 scores were dichotomized using cut off of 3 for depression and anxiety symptoms (Kroenke et al., 2009; Kroenke, Spitzer, Williams, & Löwe, 2010). Psychological distress was measured using PHQ-4 total score (Cronbach’s alpha = 0.87) and used the following score ranges to define levels of severity: None 0–2; Mild 3–5; Moderate 6–8; Severe 9–12. Similarly, the psychological distress score was dichotomized: none or mild (score 0–5) and moderate or severe (Kroenke et al., 2009, 2010). Cronbach’s alpha for the PHQ-4 among our sample was 0.87.

Stress

Stress was measured with a single item (Elo, Leppänen, & Jahkola, 2003). Participants were presented with a definition of stress as follows: “Stress means a situation in which a person feels tense, restless, nervous or anxious or is unable to sleep at night because his/her mind is troubled all the time.” After this definition, participants responded to the question “Do you feel this kind of stress?” Response options were: “Never (0)” “Rarely (1),” “Sometimes (2),” “Often (3),” and “Always (4).”

Socio-demographic covariates

Participants were asked to report their age (in years), which was categorized into five groups: 18–24, 25–29, 30–39, 40–49, 50 years and older. In addition, participants also reported whether or not they were born in France (yes, no), their sexual orientation (gay, bisexual), employment status (employed, unemployed, student), and current relationship status (single, relationship with a man).

Statistical analyses

In this study, we first examined the descriptive statistics of the participants. Then, we examined the differences in sociodemographic characteristics and financial hardship status by mental health outcomes using Chi-squared tests. Subsequently, we computed the unadjusted and adjusted risk ratio (RR) with 95% confidence intervals (CIs) to investigate the relationships between financial hardship, depressive symptoms, anxiety symptoms, and psychological distress using a modified Poisson regression model (i.e., Poisson regression with a robust error variance). The p-value for trend for trichotomous variable of financial hardship was computed by using univariate and multivariate logistic regression models. Additionally, we performed a mediation analysis to examine the potential mediating effects of stress levels on the association between financial hardship and mental health outcomes. We used the paramed macro command in Stata based on the SAS and SPSS macros by Valeri and VanderWeele (Emsley & Liu, 2013; Valeri & VanderWeele, 2013) to estimate the natural indirect effects and bootstrapped bias-corrected 95% confidence intervals (1000

bootstrap replications). Sociodemographic variables were controlled in the adjusted models. All analyses were performed using Stata 14 (Stata Corp, College Station, TX). A two-tailed *P*-value less than 0.05 was considered statistically significant.

Results

Table 1 presents the sociodemographic and financial hardship characteristics by symptoms for depression, anxiety, and psychological distress. The participants ranged in age from 18 to 66 years. Most participants reported being gay (84.0%), born in France (77.6%), and employed (66.9%). About two-thirds reported that they were at the time of the survey (65.2%). In terms of financial hardship, 13.9% of the participants reported “very difficult” or “extremely difficult,” 51.3% of the participants reported “not at all difficult” or “not very difficult” and 31.6% of the participants reported “somewhat difficult.” One fifth (20.9%) of the participants reported having depression, 24.3% reported having anxiety, and 21.7% reported having psychological distress. People reported as unemployed were more likely to have depression ($p < 0.0001$).

Table 2 shows the association between high levels of financial hardship and mental health outcomes. The simple model showed that high levels of financial hardship were significantly associated with depression, anxiety, and psychological distress. After adjusting for sociodemographic characteristics, compared with low levels of financial hardship, significant relationships were found between high levels of financial hardship and depression (aRR = 1.70; 95% CI = 1.23, 2.35) and psychological distress (aRR 1.56; 95% CI = 1.09, 2.23). There was no association between financial hardship and anxiety. When trichotomized measure of financial hardship was used, significant associations were found in depressive symptoms, anxiety symptoms and psychological distress. For example, a high level of financial hardship was associated with anxiety (aRR = 2.40; 95% CI = 1.68, 3.42) compared low levels of financial hardship.

Results from the mediation analysis are presented in Table 3. There were statistically significant mediating effects of stress level in the association between financial hardship and mental health outcomes. For example, the natural indirect effects of financial hardship on depressive symptoms through stress level was found to be significant (Estimate = 1.08; bootstrapped bias corrected 95% CI = 1.02, 1.17), and the direct effect was nonsignificant (Estimate = 1.43; bootstrapped bias corrected 95% CI = 0.92, 2.19) indicating mediation.

Discussion

The purpose of this study was to examine the role of financial hardship on mental health burden among a sample of gay, bisexual, and other MSM in Paris. In this study, almost half of the sample (46%) reported high financial hardship. Additionally, those who reported financial hardship among our sample were more likely to experience depressive symptoms and psychological distress. Using mediating analyses, stress was revealed to be a mediating variable between the exposure, financial hardship, and mental health outcomes in the trichotomous variable model analyses.

Despite the existing research in the literature on financial hardship and mental health burden among general populations mainly focused in the US, this study is considered the first to examine this association in a sample that represents a sexual minority in Europe. Similar to previous research conducted on different populations, our results are consistent in stating that financial hardship is associated with different dimensions of negative mental health outcomes (Christodoulou & Christodoulou, 2013; Diaz, Ayala, Bein, Henne, & Marin, 2001; Hope, Power, & Rodgers, 1999). To illustrate, Diaz et al. found an association between mental health difficulties experienced and the social difficulties individuals face in their daily lives (including financial hardship), among a sample of gay and bisexual Latino men ($n = 912$) in 3 different US cities (Diaz et al., 2001). Similarly, Hope et al. found an association between financial hardship and psychological distress in a sample of lone mothers (Hope et al., 1999), where individuals with high financial hardship were 1.43 more times to report psychological distress than those with low financial hardship. The findings of this study confirm previous findings in the literature, which have been ultimately focused on US-based populations. The current study extends this earlier work through the addition of a European perspective and sexual minority perspective, which has implications for programs that seek to support this population in France and other European countries.

Despite that the specific pathway(s) in which financial hardship affects health outcomes remains not fully understood, several causal explanations have been proposed (Kiely, Leach, Olesen, & Butterworth, 2015; Nepomnyaschy & Garfinkel, 2011; Weaver, Taylor, Chatters, & Himle, 2018). Financial hardship and the status of being a sexual minority directly leads to social alienation and low-self-esteem among individuals (Diaz et al., 2001). In addition, and as mentioned previously, gays, bisexuals, and other MSM are often discriminated against in the workplace, adding psychological stress in their life regarding a secured employment status. This means that gays, bisexuals, and other MSM are often deprived from enjoying the benefits of permanent work, which include not only a higher income, but also social support, increased self-esteem, social status, the imposition of a daily routine, and relief from stress at home (Brown & Harris, 2012; Macran, Clarke, & Joshi, 1996). Similarly, financial hardship often causes individuals to fail meeting their medical needs (Tucker-Seeley et al., 2015). Applying the stress process model, these potentially stressful events that are due to financial hardship and minority status will often lead to subjective cognitive appraisal (personalized perception of threat) and thus will eventually lead to emotional, psychological, and behavioral response such as depression and psychological distress (Katerndahl & Parchman, 2002), which were all reported in this study as measures of mental health burden.

Future research

Financial hardship was measured with a single item, and while this item has been used by other studies (Lantz, House, Mero, & Williams, 2005; Pearlin & Schooler, 1978; Tucker-Seeley et al., 2015), future research would benefit from using a scale with multiple items, either including or excluding the item used in this study. Utilizing tools such as the Financial Strain Survey (FSS), an 18-item measure that examines how finances place strain on an individual's relationships, responsibilities, and health, would allow for more thorough examination of financial hardship (Aldana & Liljenquist, 1998). Additionally, future work

might identify the unique impact of subjective financial hardship apart from objective financial hardship, in line with the latest research on financial hardship and psychological health (Bradshaw & Ellison, 2010). It may be worthwhile for researchers to develop and test interventions to help people manage the emotional impact of financial hardship, as opposed to only trying to alleviate the objective hardship.

Similarly, a very brief measure was used to screen for symptoms of anxiety and depression, the Patient Health Questionnaire-4 (PHQ-4). Future research should focus on using more thorough screening tools, which will lead to greater specificity in assessing these mental health outcomes, thus limiting any inflation in the reported prevalence of anxiety and depression (Nease & Malouin, 2003; Plummer, Manea, Trepel, & McMillan, 2016; Whooley, Avins, Miranda, & Browner, 1997). In addition, the use of structured clinical interviews of mental health status, such as the Composite International Diagnostic Interview (CIDI) may provide a more comprehensive understanding of mental health and well-being in this population (Kessler & Üstün, 2004). Finally, future research should utilize more developed study designs. This study used a cross-sectional design, making it harder to measure for social selection (e.g., individuals with mental health problems may be incapacitated in ways that lead to unemployment, or economic hardship) (Kessler, Foster, Saunders, & Stang, 1995; Kessler & Frank, 1997). Longitudinal study designs could be incorporated to be able to conclude for causations.

Limitations

This study has limitations that are important to note. As previously mentioned, one limitation to note is the use of a single item to examine financial hardship. There exists a range of hardships that can be measured, which is able to give a better representation of economic hardships such as the one used in previous research (Abel et al., 2016). Furthermore, self-report represents a concern given that recall bias as well as social desirability bias can be issues associated with it. Similarly, same-source bias can be a concern as this study exposure and outcome were both measure via self-report (Podsakoff, MacKenzie, & Podsakoff, 2012). In addition, the measures of mental health, although validated (Elo et al., 2003; Kurt Kroenke et al., 2010), were each assessed with a few items, which may be subject to misclassification. Moreover, generalizability is a concern as this study focused on a population in Western Europe who used a single geo-social networking application. This is a concern for a variety of reasons; for example, gays, bisexuals, and other MSM who use geo-social networking applications might be different from those who do not. Finally, it is important to note that the current study design (e.g., cross-sectional) does not allow to infer causation. According to Kessler *et al.* early onset mental disorders can lead to more unemployment, less years of education and more financial hardship throughout one's life (REF). Hence, while the current findings extend the limited literature on this topic, it is possible that previously recurring mental disorders contributed to an increased financial hardship among participants.

Conclusions

High financial hardships were associated with depressive symptoms and psychological distress in this sample of gays, bisexuals, and other MSM from Paris, France. Results from this study should be replicated using longitudinal study design to establish causation, but these preliminary results suggest, rather unsurprisingly, that future interventions to reduce financial hardships may have positive effects on the mental health of gay, bisexual, and other MSM. While the precise mechanism(s) in which this association occurs remain to be investigated further, these preliminary results suggest the role of stress as a mediating variable along the association.

Acknowledgements

We thank the translators and participants of this study who contributed to the project. We thank William Goedel and Jace Morganstein for assisting in the development, translation and management of the survey used in the current study. We thank Ryan Grace for reviewing an early version of the manuscript.

Funding

This work was supported by Dr. Dustin Duncan's New York University School of Medicine Start-Up Research Fund. Dr. Safren's time was supported by grant 9K24DA040489.

References

- Abel GA, Albelda R, Khera N, Hahn T, Salas Coronado DY, Odejide OO, ... Soiffer R (2016). Financial hardship and patient-reported outcomes after hematopoietic cell transplantation. *Biology of Blood and Marrow Transplantation*, 22(8), 1504–1510. doi:10.1016/j.bbmt.2016.05.008 [PubMed: 27184627]
- Aldana SG, & Liljenquist W (1998). Validity and reliability of a financial strain survey. *Journal of Financial Counseling and Planning*, 9(2), 11.
- Arabsheibani GR, Marin A, & Wadsworth J (2007). Variations in gay pay in the USA and in the UK sexual orientation discrimination (pp. 62–79). London, UK: Routledge.
- Ayala G, Bingham T, Kim J, Wheeler DP, & Millett GA (2012). Modeling the impact of social discrimination and financial hardship on the sexual risk of HIV among Latino and Black men who have sex with men. *American Journal of Public Health*, 102(S2), S242–S249. doi:10.2105/AJPH.2011.300641 [PubMed: 22401516]
- Badgett L, & Frank J (2007). *Sexual orientation discrimination: An international perspective*. London, UK: Routledge.
- Bauermeister JA, Meanley S, Hickok A, Pingel E, VanHemert W, & Loveluck J (2014). Sexuality-related work discrimination and its association with the health of sexual minority emerging and young adult men in the Detroit Metro Area. *Sexuality Research and Social Policy*, 11(1), 1–10. doi:10.1007/s13178-013-0139-0 [PubMed: 24659928]
- Bradshaw M, & Ellison CG (2010). Financial hardship and psychological distress: Exploring the buffering effects of religion. *Social Science & Medicine* (1982), 71(1), 196–204. doi:10.1016/j.socscimed.2010.03.015 [PubMed: 20556889]
- Brown GW, & Harris T (2012). *Social origins of depression: A study of psychiatric disorder in women*. London, UK: Routledge.
- Chae DH, Krieger N, Bennett GG, Lindsey JC, Stoddard AM, & Barbeau EM (2010). Implications of discrimination based on sexuality, gender, and race/ethnicity for psychological distress among working-class sexual minorities: The United for Health Study, 2003–2004. *International Journal of Health Services*, 40(4), 589–608. doi:10.2190/HS.40.4.b [PubMed: 21058533]
- Chi DL, & Tucker-Seeley R (2013). Gender-stratified models to examine the relationship between financial hardship and self-reported oral health for older US men and women. *American Journal of Public Health*, 103(8), 1507–1515. doi:10.2105/AJPH.2012.301145 [PubMed: 23327271]

- Christodoulou NG, & Christodoulou GN (2013). Financial crises: Impact on mental health and suggested responses. *Psychotherapy and Psychosomatics*, 82(5), 279–284. doi: 10.1159/000351268 [PubMed: 23942174]
- Diaz RM, Ayala G, Bein E, Henne J, & Marin BV (2001). The impact of homophobia, poverty, and racism on the mental health of gay and bisexual Latino men: Findings from 3 US cities. *American Journal of Public Health*, 91(6), 927. [PubMed: 11392936]
- Duncan DT, Park SH, Al-Ajlouni YA, Hale L, Jean-Louis G, Goedel WC, ... Elbel B (2017). Association of financial hardship with poor sleep health outcomes among men who have sex with men. *SSM - Population Health*, 3, 594–599. doi:10.1016/j.ssmph.2017.07.006 [PubMed: 29349248]
- Duncan DT, Park SH, Schneider JA, Al-Ajlouni YA, Goedel WC, Elbel B, ... Mayer KH (2017). Financial hardship, condomless anal intercourse and HIV risk among men who have sex with men. *AIDS and Behavior*, 21(12), 3478–3485. doi:10.1007/s10461-017-1930-3 [PubMed: 29101606]
- Elo A-L, Leppänen A, & Jahkola A (2003). Validity of a single-item measure of stress symptoms. *Scandinavian Journal of Work, Environment & Health*, 29(6), 444–451. doi: 10.5271/sjweh.752
- Emsley R, & Liu H (2013). PARAMED: Stata module to perform causal mediation analysis using parametric regression models. Retrieved from <https://EconPapers.repec.org/RePEc:boc:bocode:s457581>
- Harkness JA, van de Vijver FJ, Mohler PP, & Wiley J (2003). *Cross-cultural survey methods* (Vol. 325). Hoboken, NJ: Wiley-Interscience.
- Hope S, Power C, & Rodgers B (1999). Does financial hardship account for elevated psychological distress in lone mothers? *Social Science & Medicine*, 49(12), 1637–1649. [PubMed: 10574235]
- Jenkins R, Bhugra D, Bebbington P, Brugha T, Farrell M, Coid J, ... Meltzer H (2008). Debt, income and mental disorder in the general population. *Psychological Medicine*, 38(10), 1485–1493. doi:10.1017/S0033291707002516 [PubMed: 18184442]
- Karanikolos M, Mladovsky P, Cylus J, Thomson S, Basu S, Stuckler D, ... McKee M (2013). Financial crisis, austerity, and health in Europe. *The Lancet*, 381(9874), 1323–1331.
- Katerndahl DA, & Parchman M (2002). The ability of the stress process model to explain mental health outcomes. *Comprehensive Psychiatry*, 43(5), 351–360. doi:10.1053/comp.2002.34626 [PubMed: 12216010]
- Kessler RC, Foster CL, Saunders WB, & Stang PE (1995). Social consequences of psychiatric disorders, I: Educational attainment. *American Journal of Psychiatry*, 152(7), 1026–1032. [PubMed: 7793438]
- Kessler RC, & Frank RG (1997). The impact of psychiatric disorders on work loss days. *Psychological Medicine*, 27(4), 861–873. [PubMed: 9234464]
- Kessler RC, & Üstün TB (2004). The world mental health (WMH) survey initiative version of the world health organization (WHO) composite international diagnostic interview (CIDI). *International Journal of Methods in Psychiatric Research*, 13(2), 93–121. [PubMed: 15297906]
- Kiely KM, Leach LS, Olesen SC, & Butterworth P (2015). How financial hardship is associated with the onset of mental health problems over time. *Social Psychiatry and Psychiatric Epidemiology*, 50(6), 909–918. doi:10.1007/s00127-015-1027-0 [PubMed: 25683473]
- Kroenke K, Spitzer RL, Williams JB, & Lowe B (2009). An ultra-brief screening scale for anxiety and depression: The PHQ-4. *Psychosomatics*, 50(6), 613–621. doi:10.1176/appi.psy.50.6.613 [PubMed: 19996233]
- Kroenke K, Spitzer RL, Williams JB, & Löwe B (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry*, 32(4), 345–359. doi:10.1016/j.genhosppsych.2010.03.006 [PubMed: 20633738]
- Lantz PM, House JS, Mero RP, & Williams DR (2005). Stress, life events, and socioeconomic disparities in health: Results from the Americans' Changing Lives Study. *Journal of Health and Social Behavior*, 46(3), 274–288. doi:10.1177/002214650504600305 [PubMed: 16259149]
- Lynch JW, Kaplan GA, & Shema SJ (1997). Cumulative impact of sustained economic hardship on physical, cognitive, psychological, and social functioning. *New England Journal of Medicine*, 337(26), 1889–1895. doi:10.1056/NEJM199712253372606 [PubMed: 9407157]

- Macran S, Clarke L, & Joshi H (1996). Women's health: Dimensions and differentials. *Social Science & Medicine*, 42(9), 1203–1216. doi:10.1016/0277-9536(95)00432-7 [PubMed: 8733191]
- Meyer IH (1995). Minority stress and mental health in gay men. *Journal of Health and Social Behavior*, 36(1), 38–56. doi:10.2307/2137286 [PubMed: 7738327]
- Nease DE Jr., & Malouin JM (2003). Depression screening: A practical strategy. (Applied evidence: Research findings that are changing clinical practice). *Journal of Family Practice*, 52(2), 118–126. [PubMed: 12585989]
- Nepomnyaschy L, & Garfinkel I (2011). Fathers' Involvement with Their Nonresident Children and Material Hardship. *The Social Service Review*, 85(1), 3–38. doi:10.1086/658394 [PubMed: 21822335]
- Park SH, Al-Ajlouni Y, Palamar JJ, Goedel WC, Estreet A, Elbel B, ... Duncan DT (2018). Financial hardship and drug use among men who have sex with men. *Substance Abuse Treatment, Prevention, and Policy*, 13(1), 19. doi:10.1186/s13011-018-0159-0
- Pearlin LI, & Schooler C (1978). The structure of coping. *Journal of Health and Social Behavior*, 19(1), 2–21. doi:10.2307/2136319 [PubMed: 649936]
- Plummer F, Manea L, Trepel D, & McMillan D (2016). Screening for anxiety disorders with the GAD-7 and GAD-2: A systematic review and diagnostic metaanalysis. *General Hospital Psychiatry*, 39, 24–31. doi:10.1016/j.genhosppsych.2015.11.005 [PubMed: 26719105]
- Podsakoff PM, MacKenzie SB, & Podsakoff NP (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539–569. doi:10.1146/annurev-psych-120710-100452
- Tucker-Seeley RD, Harley AE, Stoddard AM, & Sorensen GG (2013). Financial hardship and self-rated health among low-income housing residents. *Health Education & Behavior : The Official Publication of the Society for Public Health Education*, 40(4), 442–448. doi:10.1177/1090198112463021 [PubMed: 23104979]
- Tucker-Seeley RD, Li Y, Subramanian SV, & Sorensen G (2009). Financial hardship and mortality among older adults using the 1996–2004 Health and Retirement Study. *Annals of Epidemiology*, 19(12), 850–857. doi:10.1016/j.annepidem.2009.08.003 [PubMed: 19944348]
- Tucker-Seeley RD, Mitchell JA, Shires DA, & Modlin CS Jr. (2015). Financial hardship, unmet medical need, and health self-efficacy among African American men. *Health Education & Behavior*, 42(3), 285–292. doi:10.1177/1090198114557125 [PubMed: 25413374]
- Valeri L, & VanderWeele TJ (2013). Mediation analysis allowing for exposure–mediator interactions and causal interpretation: Theoretical assumptions and implementation with SAS and SPSS macros. *Psychological Methods*, 18(2), 137. doi:10.1037/a0031034 [PubMed: 23379553]
- Weaver A, Taylor RJ, Chatters LM, & Himle JA (2018). Depressive symptoms and psychological distress among rural African Americans: The role of material hardship and self-rated health. *Journal of Affective Disorders*, 236, 207–210. doi:10.1016/j.jad.2018.04.117 [PubMed: 29747138]
- Whooley MA, Avins AL, Miranda J, & Browner WS (1997). Case-finding instruments for depression. *Journal of General Internal Medicine*, 12(7), 439–445. doi:10.1046/j.1525-1497.1997.00076.x [PubMed: 9229283]

Table 1.

Sample characteristics and perceived financial hardship status by mental health.

	Total <i>n</i> (%)	Depression ^a (<i>n</i> = 121)			Anxiety ^b (<i>n</i> = 141)			Psychological distress ^c (<i>n</i> = 126)		
		<i>n</i>	%	<i>p</i> ^d	<i>n</i>	%	<i>p</i> ^d	<i>n</i>	%	<i>p</i> ^d
Age				0.044			0.318			0.138
18–24	84 (14.5)	24	28.6		20	23.8		21	25.0	
25–29	103 (17.8)	26	25.2		30	29.1		31	30.1	
30–39	180 (31.0)	42	23.3		40	22.2		39	21.7	
40–49	139 (24.0)	22	15.8		40	28.8		26	18.7	
50	54 (9.3)	6	11.1		9	16.7		8	14.8	
Sexual orientation				0.441			0.984			0.716
Gay	487 (84.0)	106	21.8		122	25.1		107	22.0	
Bisexual	69 (11.9)	12	17.4		17	24.6		16	23.2	
Born in France				0.516			0.922			0.709
Yes	450 (77.6)	94	20.9		113	25.1		99	22.0	
No	113 (19.5)	27	23.9		28	24.8		27	23.9	
Employment status				<0.0001			0.277			0.071
Employed	388 (66.9)	63	16.2		89	22.9		75	19.3	
Unemployed	84 (14.5)	32	38.1		26	31.0		24	28.6	
Student	81 (14.0)	23	28.4		22	27.2		23	28.4	
Current relationship				0.074			0.137			0.662
Single	378 (65.2)	89	23.5		87	23.0		85	22.5	
Relationship with a man	172 (29.7)	29	16.9		50	29.1		36	20.9	
Financial Hardship				<0.0001			<0.0001			<0.0001
Not at all difficult	143 (24.7)	17	11.9		26	18.2		21	14.7	
Not very difficult	154 (26.6)	31	20.1		35	22.7		31	20.1	
Somewhat difficult	183 (31.6)	41	22.4		38	20.8		38	20.8	
Very difficult	57 (9.8)	20	35.1		25	43.9		22	38.6	
Extremely difficult	24 (4.1)	12	50.0		16	66.7		14	58.3	
Stress				<0.0001			<0.0001			<0.0001
Never	42 (7.2)	3	7.1		3	7.1		2	4.8	
Rarely	133 (22.9)	12	9.0		3	2.3		7	5.3	
Sometimes	217 (37.4)	31	14.3		30	13.8		28	12.9	
Often	140 (24.1)	51	36.4		71	50.7		60	42.9	
Always	34 (5.9)	24	70.6		34	100.0		29	85.3	

^aCut-off points: PHQ2 3.^bCut-off points: GAD-2 3.^cCut-off points: PHQ-4 6.^d*p*-values calculated using Chi-square tests or Fisher's exact test.

Table 2.

Risk Ratios (95% CIs) of mental health associated with high financial hardship, before and after controlling for socio-demographic and stress factors.

	Depression		Anxiety		Psychological Distress	
	RR (95% CI) ^b	aRR (95% CI) ^c	RR (95% CI) ^b	aRR (95% CI) ^c	RR (95% CI) ^b	aRR (95% CI) ^c
Financial hardship Model 1						
Low	Referent	Referent	Referent	Referent	Referent	Referent
High	1.70 (1.23, 2.35) **	1.48 (1.04, 2.11) *	1.45 (1.08, 1.93) *	1.37 (0.99, 1.89)	1.59 (1.16, 2.17) **	1.56 (1.09, 2.23) *
Financial Hardship Model 2						
Low	Referent	Referent	Referent	Referent	Referent	Referent
Medium	1.38 (0.95, 2.01)	1.29 (0.87, 1.91)	1.00 (0.70, 1.44)	0.98 (0.67, 1.45)	1.18 (0.81, 1.71)	1.21 (0.80, 1.81)
High	2.42 (1.66, 3.52) **	1.97 (1.29, 2.99) **	2.45 (1.79, 3.34) **	2.40 (1.68, 3.42) **	2.50 (1.77, 3.54) **	2.53 (1.68, 3.79) **
<i>p</i> for trend	<0.0001	0.006	<0.0001	0.001	<0.0001	<0.0001

Note: CI, confidence interval.

* $p < 0.05$.

** $p < 0.01$.

^a Poisson with option – robust – was used for this regression due to convergence issues.

^b Unadjusted.

^c Adjusted for age, sexual orientation, origin (born in France), employment, and relationship status.

Table 3.

Mediation analysis^a of stress on anxiety and depression symptoms, psychological distress and financial hardship.

Independent variable	Mediating variable	Dependent variable	CDE, estimate (95% CI)	NIE, estimate (95% CI)	MTE, estimate (95% CI)
Financial hardship (2-level)	Stress	Depression	2.00 (0.73, 6.19)	1.11 (0.99, 1.26)	1.48 (1.02, 2.09)
		Anxiety	2.54 (0.90, 7.52)	1.16 (1.00, 1.38)	1.30 (0.96, 1.80)
		Psychological distress	3.43 (1.03, 10.78)	1.14 (0.99, 1.36)	1.53 (1.07, 2.26)
Financial hardship (3-level)	Stress	Depression	1.43 (0.92, 2.19)	1.08 (1.02, 1.17)	1.23 (1.05, 1.46)
		Anxiety	1.70 (1.08, 2.81)	1.13 (1.03, 1.26)	1.22 (1.04, 1.43)
		Psychological distress	1.84 (1.14, 3.10)	1.12 (1.00, 1.23)	1.28 (1.09, 1.55)

Note: SE, standard error; CDE, controlled direct effect; NIE, natural indirect effect; MTE, marginal total effect.

^aModels adjusted for age, sexual orientation, origin, employment and relationship status.