Association of financial hardship with poor sleep health outcomes among men who have sex with men

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ABSTRACT

Previous studies have identified an association between socioeconomic status and sleep health. While some research has studied this association among sexual minority groups, including men who have sex with men (MSM), they exclusively focused on US-based populations. The interplay between the two in shaping sleep health has not been previously examined on populations residing outside the US. This study considers both determinants, by investigating whether financial hardship is associated with sleep health among a sample of MSM in Paris, France. Broadcast advertisements were placed on a popular geosocial-networking smartphone application for MSM to direct users in Paris to a web-based survey measuring financial hardship and five dimensions of sleep health as well as socio-demographic characteristics. Modified Poisson models with robust error variance were computed to estimate risk ratios (RRs) and 95% confidence intervals (CI) for the associations between financial hardship and the following self-reported outcomes: 1) poor sleep quality, 2) short sleep duration; and 3) sleep problems. In total, 580 respondents completed the survey. In this sample, both financial hardship and poor sleep health were common - 45.5% reported that it was extremely, very, or somewhat difficult for them to meet their monthly payments on bills (referred to as "high financial hardship") and 30.1% rated their sleep as fairly bad or very bad (referred to as "poor sleep quality"). Multivariate models revealed that, compared to participants who reported low financial hardship, those who reported high financial hardship were more likely to report poor sleep quality (aRR: 1.35, 95% CI: 1.04, 1.77), to report problems falling asleep (aRR: 1.23, 95% CI: 1.02, 1.49), and to report problems staying awake in the daytime (aRR: 3.12, 95% CI: 1.83, 5.31). Future research should investigate whether this relationship is causal and determine whether interventions to reduce financial hardships could promote sleep health among MSM.

1. Introduction

Gay, bisexual, and other men who have sex with men (MSM) often experience poor sleep health (Duncan et al., 2016a; Rahman & Silber, 2000). For example, as compared to heterosexual individuals, one study found that gay males wake up earlier and go to sleep significantly later, indicating that gay males have shorter sleep duration (Rahman & Silber, 2000). A recent study of MSM found that about one-third of the sample reported poor sleep quality and almost half reported sleeping less than 7 h every night (Duncan et al., 2016a). Poor sleep health, among the general population and among sexual minorities, has been associated

with a range of adverse health outcomes, including risk of HIV, mental health, diabetes, and obesity (Buxton & Marcelli, 2010; Duncan et al., 2016a; Jean-Louis et al., 2014; Mallon, Broman, & Hetta, 2005; Xiao, Keadle, Hollenbeck, & Matthews, 2014; Zhang et al., 2015).

Emerging research has examined the role of financial hardship (when one has insufficient financial resources to adequately meet household's needs) on health outcomes (Ayala, Bingham, Kim, Wheeler, & Millett, 2012; Chi & Tucker-Seeley, 2013; Ferrie, Martikainen, Shipley, & Marmot, 2005; Lynch, Kaplan, & Shema, 1997; Tucker-Seeley, Harley, Stoddard, & Sorensen, 2013; Tucker-Seeley, Li, Subramanian, & Sorensen, 2009; Tucker-Seeley, Abel, Uno, & Prigerson,

2015), including sleep health (Hill, Burdette, & Hale, 2009; Magee, Gordon, & Caputi, 2014; McHale, Kim, Kan, & Updegraff, 2011), among general populations. For instance, a study using data from the 2004 Survey of Texas Adults (*n* = 1504) found that financial hardship was associated with poor sleep quality (Hill et al., 2009). While no research has assessed the potential associations between financial hardship and various dimensions of sleep health among MSM and other sexual minority populations, there is a recent important study that investigated associations between socioeconomic status (i.e., income, employment status, education) and sleep health among gay and bisexual men living with HIV (Downing Jr et al., 2016). In particular, this US-based study found that these traditional socioeconomic status indicators were associated with sleep health, particularly poor self-reported sleep quality and the use of medication for improving sleep, among their sample of gay and bisexual men.

The minority stress model, as articulated by Meyer (Meyer, 2003), proposes that stigma, prejudice, and discrimination are chronic psychosocial stressors that can lead to negative health outcomes in marginalized populations such as MSM populations. Institutionalized forms of homophobia (e.g., a lack of employment non-discrimination protections) have significant implications for the health of sexual minorities (Hatzenbuehler, Phelan, & Link, 2013). A growing body of literature has suggested that MSM earn less than heterosexual men and that this is due to manifestations of discrimination in the workplace, including the firing of an individual or denying them employment, denying a promotion, or giving negative performance evaluations on the basis of their sexual orientation (Arabsheibani, Marin, & Wadsworth, 2006; Badgett & Frank, 2007). Wage gaps between heterosexual and sexual minority men have been reported in studies in the United States, the United Kingdom and France. For example, it is reported that MSM in France suffer from an average wage penalty equal to -6.3% when compared to heterosexual men (Laurent & Mihoubi, 2012). Socioeconomic manifestations of homophobic prejudice may lead to increased financial hardship among MSM.

It is important to note that the 2009 financial crisis brought about one of the highest unemployment rates in Western Europe (Arpaia & Curci, 2010). According to the most recent estimates, the unemployment rate in France is still above 10%, which is more than double that of the rate in the United Kingdom) (Bentolila, Cahuc, Dolado, & Le Barbanchon, 2012; Vail, 2014). The recession was also accompanied by an increase in income inequality over the past decade (Dreger, López-Bazo, Ramos, Royuela, & Suriñach, 2015), which may have exacerbated existing income differences between heterosexual and sexual minority individuals.

1.1. Study objective and Hypotheses

The objective of this study was to examine the association between financial hardship and sleep health among a sample of MSM in the Paris (France) metropolitan area, which has not been examined in any MSM sample previously. Studying this association among MSM population is significant, given the lack of existing research and the plausible relationship. Based on past empirical research (Hill et al., 2009; Magee et al., 2014; McHale et al., 2011), it is hypothesized that high levels of financial hardship will be associated with poor sleep quality, short sleep duration, and sleep problems such as problems falling and staying asleep.

2. Data and methods

In October 2016, we used broadcast advertisements on a popular geosocial-networking smartphone application for MSM to recruit our sample. We limited the advertisements to users in the Paris (France) metropolitan area. As done in previous research (Duncan et al., 2016a; Duncan et al., 2016b; Goedel & Duncan, 2015), users were shown an advertisement with text encouraging them to click through the

advertisement to complete an anonymous web-based survey. The advertisement described that users who completed the survey were entered in a chance to win €65, which is approximately $US70. We provided the incentive to encourage participation. The advertisement was placed during three consecutive 24-hour weekday periods. After implementing precautions to avoid and eliminate duplicate responses (Duncan et al., 2016a), we found no apparent duplicate responses. Our survey included 52 items and was translated from English into French using an adaptation of the TRAPD (Translate, Review, Adjudicate, Pretest, Document) translation protocol, which others has been described in detail previously (Harkness, Van de Vijver, & Mohler, 2003). Five French speakers assisted with survey translation. The survey was offered in French and English. Most participants (94.3%) took the survey in French. At the end of the recruitment period, 5206 users had clicked on the advertisement and reached the landing page of the survey and 935 users provided informed consent and began the survey. In total, 580 users provided informed consent and completed the survey. This represents a completion rate of 62.0% and an overall completion rate of 11.1%. Our completion rate is comparable to other studies of MSM recruited from geosocial-networking smartphone applications (Duncan et al., 2016a; Duncan et al., 2016b; Goedel and Duncan, 2015). The New York University School of Medicine Institutional Review Board approved all protocols before any data collection.

3. Measures

3.1. Financial hardship

We evaluated financial hardship with a question on the survey reading, "How difficult is it for you to meet monthly payments on bills?" (Tucker-Seeley, Mitchell, Shires, & Modlin, 2014). Response options included: "Not at all difficult"; "Not very difficult"; "Somewhat difficult"; "Very difficult"; and "Extremely difficult". In line with previous research, 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") (Tucker-Seeley et al., 2014). In addition, we created a trichotomous financial hardship variable: high financial hardship ("Very difficult" and "Extremely difficult"), medium financial hardship ("Somewhat difficult"), and low financial hardship ("Not at all difficult" and "Not very difficult").

3.2. Sleep health

Items were taken or adapted from The Pittsburgh Sleep Quality Index (PSQI), which is a reliable and validated scale of sleep health (Buysse, Reynolds, Monk, Berman, & Kupfer, 1989), to examine sleep quality, sleep duration, and three aspects of sleep problems.

3.2.1. Sleep quality

We examined sleep quality with the question "During the past month, how would you rate your sleep quality overall?" (Buysse et al., 1989). Response options included: "Very good", "Fairly good", "Fairly bad", and "Very bad". These four options were dichotomized into two categories as good sleep quality (responses of "Very good" and "Fairly good") and poor sleep quality (responses of "Very bad" and "Fairly bad") for analysis (Duncan et al., 2016a).

3.2.2. Sleep duration

Typical sleep duration was assessed with the question asking, "During the past month, how many h of actual sleep did you get each night? (This may be different from the number of hours you spent in bed.)" (Buysse et al., 1989). Responses were open-ended but limited to a single integer. Short sleep duration was defined as less than 7 h (Duncan et al., 2016a; Gallicchio & Kalesan, 2009; Hirshkowitz et al., 2015; Ruff et al., 2016; Watson et al., 2015).