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Neighbourhood disadvantage, network capital and restless sleep: Is the association moderated by gender in urban-dwelling adults?

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ABSTRACT

Despite evidence suggesting that social and neighbourhood contexts may relate to sleep in adults, the underlying social and demographic mechanisms involved remain relatively unexplored. This study proposes a conceptual framework for examining the link between social environments and restless sleep, and assesses whether associations among restless sleep, social capital, and neighbourhood environments differ by gender. Data come from the 2008 Montreal Neighborhood Networks and Healthy Aging Study ($n = 2707$). Participants self-reported restless sleep. Network and cognitive dimensions of social capital were examined. Neighbourhood disadvantage and population density were measured using 2006 Canada Census data. Multilevel logistic analyses adjusting for socio-economic and -demographic variables were used to estimate associations among study variables. The final sample size for this study was 2643 adults ($n_{men} = 930$; $n_{women} = 1713$). Women were more likely to experience restless sleep than men (OR: 1.29; 95% CIs: 1.07, 1.55). Network capital increased the likelihood of restless sleep in men (OR = 1.25; 95% CI: 1.04–1.50) but not women. High generalized trust decreased the odds of restless sleep in women (OR = 0.75; 95% CI: 0.59–0.94); neighbourhood disadvantage increased the odds of restless sleep in women but not men (OR = 1.18; 95% CI: 1.01–1.38). The association among restless sleep, social capital, and neighbourhood environmental factors differed in male and female Montreal adults. This study contributes to a greater understanding of possible differential associations between social environments and health in men and women. Greater knowledge of the social and environmental factors that contribute to poor sleep in men and women can aid in the design of interventions to improve sleep patterns in the general population. Social and health promotion interventions might aim to improve general neighbourhood environmental conditions to improve the sleep health of women.

1. Introduction

Poor sleep quality is associated with adverse physical and mental health outcomes, including chronic disease, respiratory problems, depressive symptoms, anxiety, and poor general and self-reported health (Strine and Chapman, 2005; Foley et al., 1995; Devins et al., 1993). Restless sleep, characterized by trouble falling asleep and maintaining sleep throughout the night, is a complaint that is prevalent in about 30% of the Canadian population (Hurst, 2008). Self-reported restless sleep has been linked with chronic illness, poorer perceived health, depressive symptoms, illness comorbidities, and increased illness intrusiveness (Devins et al., 1993; Kutner et al., 2001). Although men have been shown to sleep shorter durations than women (Hurst, 2008), studies on self-reported sleep and gender have reported that women tend to have more sleep problems than men (Arber et al., 2009; Foley et al., 1995; Hurst, 2008; Nordin et al., 2005). Approximately 35% of women from a nationally representative survey had trouble falling asleep or trouble staying asleep, whereas 25% of men reported the same difficulties (Hurst, 2008).

Research on sleep has conventionally focused on the physiological, behavioural, and psychological factors associated with poor sleep (Freedman and Sattler, 1982). More recently, however, social epidemiological research has begun to examine the importance of social environmental characteristics, including social relationships and neighbourhood environments, in people's experience of poor sleep (Hill et al., 2009; Nieminen et al., 2013; Nordin et al., 2005;

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Riedel et al., 2012). The present study addresses theoretical, methodological, and substantive gaps in our knowledge of social environments and sleep. Little is known about the specific mechanisms underlying associations between neighbourhood and social environmental characteristics and restless sleep, and whether these associations differ in men and women (Arber et al., 2009). Previous research has suggested that women's sleep may be more vulnerable to features of social and neighbourhood environments, whereas men's sleep may be more vulnerable to economic and employment conditions. For example, studies have shown that low social support, low social network integration, and environmental noise are associated with poor sleep in women, whereas unemployment and work-related causes are associated with poor sleep in men (Li et al., 2002; Nordin et al., 2005; Urponen et al., 1988). From an epidemiological and public health perspective, social and environmental factors are potentially modifiable and amenable to population health interventions, policies, and programs. Greater knowledge of the social and environmental factors that contribute to poor sleep in men and women can aid in the design of interventions to improve sleep patterns in the general population. Given the importance of sleep for a range of physical and mental health outcomes (Strine and Chapman, 2005; Foley et al., 1995; Devins et al., 1993), such interventions could have additional benefits for broader population health.

1.1. Conceptual framework

Fig. 1 presents the conceptual model underlying our analysis of gender, neighbourhood and social environments, and restless sleep. Daniel et al.'s (2008) conceptual model on the biosocial pathways and multilevel influences underlying the association between place and cardiometabolic disease guided our study. We have extracted several theoretical elements in Daniel et al.'s model and added a gender dimension so as to conceptualize more specifically the role of gender as a potential effect modifier in the associations among social, neighbourhood environments, and restless sleep. Daniel et al.'s (2008) model provided three theoretical elements: (1) recognition of the role of macrosocial, multilevel environmental influences on health; (2) the situating of environmental structures and neighbourhood contexts as risk conditions that affect the expression of individual outcomes; and (3) the positing of direct-contextual and indirect-cognitive pathways to explain place–person–health relationships. First, recognition of the role of macrosocial and multilevel influences on health has been an essential aspect of neighbourhood health effects research. Nevertheless, researchers have suggested that there remains a lack of attention to these multilevel social influences in research on sleep (Arber et al., 2009). Second, risk conditions represent the objective and subjective properties of social and built environments that increase the underlying vulnerability of people to places. Risk conditions consist of structural (i.e., asymmetries in the production and allocation of social resources) and contextual factors (i.e., the local attributes of places). Third, Daniel et al. (2008) posit that risk conditions impact health via direct-contextual and indirect-cognitive paths. The direct-contextual path represents the non-conscious stress responses by which neighbourhood contexts directly affect important biological mediators (e.g., allostatic load) of person-health relationships. The indirect-cognitive path is predicated on the conscious perception of environmental influences along with a person's psychosocial and behavioural responses to those influences (Daniel et al., 2008). Based on these theoretical elements, our model posits that gender acts as a potential effect modifier in the association between socio-environmental characteristics and restless sleep, whereby the way in which neighbourhood contexts and social relationships are associated with restless sleep differ in men and women.

1.2. Gender and sleep

First, our model suggests that sleep behaviour and patterns differ in men and women. This is based on a large body of evidence finding gender differences in adult sleep (Arber et al., 2009; Burgard et al., 2010; Foley et al., 1995; Hurst, 2008; Nordin et al., 2005; Reyner et al., 1995). It is widely accepted in the sleep

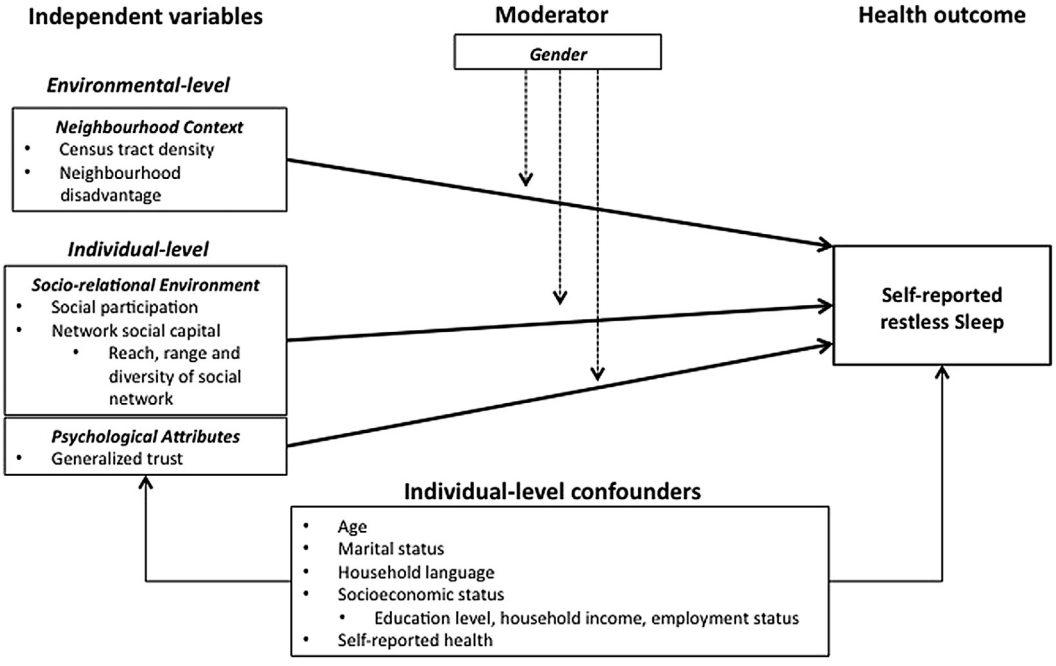

Fig. 1. Conceptual model of the association among restless sleep, social environmental characteristics, and gender.