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The enduring effects of early-childhood adversities and troubled sleep among Canadian adults: a population-based study

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ABSTRACT

Objective: Although many studies have consistently found that early-childhood adversities are important risk factors for physical and mental health problems later in adulthood, few have examined the association between early-childhood adversities and troubled sleep. The objective of this study was to examine the association between early-childhood adversities and troubled sleep among adult Canadians. **Methods:** Data for this paper ($N = 19,349$) were obtained from Statistics Canada's 2012 Canadian Community Health Survey – Mental Health (CCHS-MH). Logistic regression analysis was conducted to examine the association between early childhood adversities and troubled sleep, while accounting for various sociodemographic, socioeconomic, health, and mental health factors.

Results: Of the 19,349 respondents examined, 2748 representing 14.2% had troubled sleep. Controlling for sociodemographic, socioeconomic, health, and mental health factors, it was observed that for each additional childhood adversity experienced, the odds of having troubled sleep increased by 10% (odds ratio = 1.10, $p < 0.001$, 95% confidence interval = 1.07–1.13). In addition, psychological distress, older age, being female, being unmarried, being white, a lower annual income, chronic pain, poor perceived health, and mental health difficulties were associated with troubled sleep.

Conclusion: The results of this paper provide population-based evidence for childhood adversities as a major predictor of troubled sleep in adulthood. The long-standing effects of these adversities on sleep highlight the importance of early detection, such as consistent assessment of sleep habits for children, adolescents, and adults, who have experienced childhood adversities, in health and mental health settings.

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1. Introduction

A good night's sleep is considered important in maintaining both physical and mental health; however, sleep difficulties are common for many Canadians. Sleep problems may include difficulty falling or staying asleep, disordered breathing while sleeping, insomnia, or parasomnias [1,2]. Among Canadians, the prevalence of sleep difficulties ranges from 20% to 25%, with about 10% having severe sleep problems [3]. Findings from the US also suggest that about one in three adults have troubled sleep, with 10–15% reporting severe sleep difficulties [4–6].

Sleep problems have been studied extensively and have been found to be associated with many physical and mental health problems, including impaired decision making [3,7], increased absenteeism and loss of productivity [8,9], decreased quality of life

[4], poor physical health [10], depression and anxiety [11,12], risky health-related behaviors, such as heavy alcohol consumption and cigarette smoking [6,13,14], and suicide-related behaviors [11,15,16]. Studies have also found high rates of obesity and weight gain among individuals with troubled sleep [14,17–20].

The existing literature has also consistently found that early-childhood adversities, such as neglect, emotional, physical, and sexual abuse, are risk factors for physical and mental health problems later in adulthood [21–23]. Most of these studies have shown higher rates of poor physical health [24–26], obesity [18], anxiety and depression [27], personality disorders [28], aggression and attention deficit-hyperactivity disorder (ADHD) [29], substance use disorders [30], chronic conditions [31], and suicide-related behaviors [32,33] among individuals with a history of childhood adversities.

Although numerous studies have examined the phenomenon of troubled sleep, few have examined the association between early-childhood adversities and troubled sleep. Studies that have examined early-childhood adversities and troubled sleep have found a significant association. For example, Chapman et al. [34] analyzed data on >17,000 Americans and found that, compared to individuals with no history of childhood adversities, those with a history of childhood

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adversities were over two times more likely to report trouble falling or staying asleep. Koskenvuo et al. [13] also examined the link between childhood adversities and troubled sleep among Finnish adults and found that adults who experienced multiple childhood adversities were over three times more likely to have troubled sleep than their counterparts who did not experience any adversities growing up. This association persisted after adjusting for work status, use of psychotropic drugs, health behaviors, recent life events, and child–parent relationships.

One reason that has been proffered in trying to understand the link between early-childhood adversities and troubled sleep relates to the increased hyperarousal and hypervigilance, which often results from the experience of traumatic events [35]. Early and repeated trauma has been linked to elevated stress hormones in individuals. This prolonged elevation of stress hormones is hypothesized to alter the development of the central nervous system, including a dysregulated brain stem that is more easily startled and, thus, more prone to hyperarousal, hypervigilance, and a dysregulated neuroendocrine system, which regulates sleep arousal [36,37]. Increased hyperarousal in individuals who have post-traumatic stress disorder is thought to account for difficulties sleeping due to increased activity within the brain, making it hard to fall and stay asleep [35].

To the best of our knowledge, no study has examined the link between early-childhood adversities and troubled sleep within the Canadian context and only a few studies have examined this association within a North American sample [30,34]. Thus, the objective of this paper was to further examine the association between early-childhood adversities and troubled sleep in adulthood using a large, representative sample from Canada. In addition, of the few studies examining this relationship, one Finnish study controlled for additional factors associated with sleep, such as health behaviors, work status, and recent life events [13]. The current study aims to add to the literature by examining whether experiencing childhood adversities continue to be significantly associated with sleep problems later in adulthood after accounting for various sociodemographic, socioeconomic, health, and mental health factors within a North American sample. We hypothesized that adults, who experienced childhood adversities before age 16, would be more likely to have troubled sleep after accounting for the various control variables.

2. Methods

2.1. Data

This paper used data from Statistics Canada's 2012 Canadian Community Health Survey – Mental Health (CCHS-MH) public-use microdata files (PUMF). The CCHS-MH is a cross-sectional survey that collects information on factors influencing mental health through a multidisciplinary approach focusing on social and economic determinants of health. The CCHS-MH covers those living in the 10 provinces aged 15 years and above and uses a multistage cluster sampling design with a random sampling method to select a sample that is representative of the Canadian population [38]. Residents of the three territories, individuals living on reserves or other Aboriginal settlements, full-time members of the Canadian Forces, and institutionalized populations are excluded from the survey's coverage area. Those excluded constitute <3% of the target population [38]. Some of the main objectives of the CCHS-MH were to: "(1) assess the mental health status of Canadians on both illness and positive mental health continuums through selected mental and substance disorders, mental health problems, and well-being, and (2) assess timely, adequate, and appropriate access to and utilization of formal and informal mental health services and supports, as well as perceived needs" [38, p. 3]. The 2012 CCHS-MH includes questions on physical and mental health, resilience, mental health service utilization, alcohol and substance use, early-childhood adversities,

chronic conditions, pain and discomfort, troubled sleep, job stress, as well as income and sociodemographic characteristics.

There were 25,113 respondents, representing 28,314,716 Canadians in the 2012 CCHS-MH dataset. However, given that questions on early-childhood adversities were only asked to respondents aged 18 years and older, and because age was measured in 5-year groups, the sample used in this paper consists of 19,349 respondents aged 20 years and older. To produce a sample that is equal to the original sample size and representative of the population of Canada, the population weight was adjusted by dividing each master weight by the average weight. This was done to maintain the original sample size while, at the same time, keeping the weighting structure recommended by Statistics Canada. The adjusted population weight was used in all the analyses.

2.2. Dependent and independent variables

The dependent variable examined in this paper was troubled sleep and it was measured as a binary variable. Survey respondents were asked to rate on a five-point Likert scale ranging from 1 (none of the time) to 5 (all of the time) how often they have trouble going to sleep or staying asleep. Respondents who indicated having troubled sleep "most of the time" and "all of the time" were coded as 1 (troubled sleep) and compared to their colleagues who indicated "none of the time," "a little of the time," and "some of the time" who were coded as 0 (no troubled sleep). The decision to treat troubled sleep as a dichotomous variable to a greater extent was informed by sample size consideration. The distribution of troubled sleep and some of the ordinal variables was not proportional across the various categories but follows a binomial distribution, hence the decision to treat these variables as dichotomous variables. Although there is no agreeable definition and measurement of troubled sleep or insomnia, the most commonly used measure of troubled sleep in the epidemiologic literature [8,9,39] tends to be the frequency of trouble going to sleep or staying asleep.

The main independent variable examined in this paper was early-childhood adversities and it was measured using six questions that ask respondents about events that may have happened to them before they turned 16 years old, either in their school, in their neighborhood, or in their family: (1) How many times did you see or hear any one of your parents, stepparents, or guardians hit each other or another adult in your home? (2) How many times did an adult slap you on the face, head, or ears or hit or spank you with something hard to hurt you? (3) How many times did an adult push, grab, shove, or throw something at you to hurt you? (4) How many times did an adult kick, bite, punch, choke, burn you, or physically attack you in some way? (5) How many times did an adult force you or attempt to force you into any unwanted sexual activity, by threatening you, holding you down, or hurting you in some way? (6) How many times did an adult touch you against your will in any sexual way? By this, I mean anything from unwanted touching or grabbing, to kissing or fondling. These questions were only administered to respondents aged 18 years and older. The responses to each question was coded as 1 (never) to 5 (more than 10 times). Respondents who were coded as 2, 3, 4, or 5 were considered to have experienced the event at least once and respondents who were coded as 1 were considered not to have experienced the event. A sum of early-childhood adversity was created ($M = 1.04$, $SD = 1.41$, range = 0–6) to arrive at the number of childhood adversities experienced before age 16.

Control variables examined in this paper include age, measured as a categorical variable in groups of 10-year spans; gender coded as a binary variable with male as the reference category; immigrant status (nonimmigrant vs. immigrant); marital status (married, common-law, formerly married, and single/never married);

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