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Immigration as a social determinant of troubled sleep in Canada: some evidence from the Canadian Community Health Survey–Mental Health

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ABSTRACT

Background: The literature pays very little attention to immigrants' sleep in Canada, although sleep is essential to individual health and well-being.
Analysis: Drawing data from the Canadian Community Health Survey–Mental Health, we aim to address this void by comparing troubled sleep among recent immigrants, established immigrants, and the native-born Canadians.
Results: Despite immigrants' declining health over time in Canada, our findings reveal that both recent and established immigrants report fewer cases of troubled sleep than their native-born counterparts. Recent (odds ratio [OR] = 0.70, 95% confidence intervals [CIs] = 0.62-0.79) and established immigrants (OR = 0.86, 95% CIs = 0.79-0.92) were less likely to report troubled sleep than the native-born at the bivariate level, although its significant impact for recent immigrants was completely attenuated when health status was controlled for (OR = 0.88, 95% CIs = 0.76-1.02). Established immigrants were still less likely to report fewer cases of troubled sleep than the native-born even after controlling for all control variables (OR = 0.88, 95% CIs = 0.81-0.96).
Conclusion: Based on these findings, we discuss that fewer troubled sleep cases reported by immigrants may be explained by their initial health advantage, resilience trajectory, and cultural interpretation of sleep. We also provide several suggestions for future research.

Introduction

Sleep is essential to individual health and well-being. Research shows that adverse physical and mental health outcomes such as coronary heart disease, diabetes, hypertension, depression, and anxiety can be caused by insufficient sleep.[1] Similarly, insufficient sleep is also associated with vehicular accidents, industrial disasters, workplace hazards, and other occupational accidents.[2] Sleep disturbance is also linked to poor daytime functioning due to sleepiness, fatigue, anxiety, and depressed mood.[3] Clinical studies also emphasize the health benefits of quality sleep including daytime cognition, improved memory consolidation, and enhanced metabolism.[4,5] Among people with chronic depression and other health conditions, quality sleep is prescribed as useful in mitigating such conditions.[6]

In this context, insufficient sleep may be a major barrier for immigrants to achieve positive health, especially as the literature documents that the health of immigrants often declines over time after their arrival in the host society.[7,8] Despite this concern, very little is known about immigrants' sleep especially among adult immigrants in Canada. There are several studies that explore the relationship between sleep and immigrant status in the United States. For example, Seicean et al[1] find that Mexican-born immigrants have more favorable sleep patterns than the American-born whites, potentially accounting for their low risk of diabetes, hypertension, and other chronic diseases. Hale et al[9] also discuss a similar pattern among Chinese and Japanese female immigrants and their native-born counterparts in California and New Jersey.

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Although these studies are useful, there are at least 2 important voids in the literature. For one, although immigrants' sleep is relatively well explored in the United States, the literature rarely explores the linkage between sleep and immigrant status in Canada. For another, previous studies largely compare the patterns of sleep between immigrants and the native-born, treating immigrants as a homogeneous group. To address these voids in the literature, we draw a theoretical insight from the "healthy immigrant effect" and explore how time spent in Canada influences troubled sleep among adult immigrants. Following previous studies in Canada,[10,11] we conceptualize troubled sleep as whether individuals experience trouble falling asleep or staying asleep. To this end, we use a nationally representative survey to examine whether recent immigrants, established immigrants, and the native-born Canadians experience troubled sleep differently.

Understanding sleep in the context of the "healthy immigrant effect"

Sleep serves as an indicator of health, as evidence suggests a strong correlation between the two. Specifically, the relationship between sleep and health is considered bidirectional; insufficient sleep is a contributing factor for medical and psychological problems, whereas such problems can also cause insufficient sleep.[12] Considering the relationship between sleep and health, recent immigrants may have better sleep quality than the native-born due to their initial health advantage, as suggested by the "healthy immigrant effect"—a phenomenon where immigrants have substantially better health than the native-born at the time of arrival but worsens with years of stay in the host society.[13] According to Beiser,[14] their initial health advantage is a product of immigrant selectivity. Based on its points system, Canada selects immigrants based on human capital characteristics, favoring younger and educated individuals for immigration. In addition, individuals are required to go through the comprehensive medical screening prior to immigration, which can disqualify unhealthy ones from migrating to Canada. Consistent with Beiser's argument, the literature widely documents that recent immigrants have better physical and mental health than the native-born Canadians at the time of arrival.[7,8] Given that immigrants' initial health advantage may be linked to their favorable sleep outcomes, we will test the following hypothesis:

H_1. *Recent immigrants are less likely to report troubled sleep than the native-born due to immigrant health selectivity.*

Research also shows that sleep and health often share a wide range of social and behavioral determinants including socioeconomic, demographic, and lifestyle characteristics.[2] In this context, it is interesting that immigrants' initial health advantage often disappears within 5 to 10 years after arrival in Canada.[7,8] It is pointed out that as a result of acculturation, immigrants may gradually adopt unhealthy lifestyles common to the native-born such as smoking, drinking, and engaging in sedentary behaviors.[14] This may have an implication for their sleep, as the quality of sleep is often compromised by unhealthy life styles. For example, cigarette smoking, excessive alcohol consumption, and substance abuse are found to adversely impact the quality of sleep.[15,16] Similarly, daytime moderate physical activity has been associated with improved subjective sleep quality.[17]

In addition to lifestyle changes, declining immigrants' health is also observed partly due to their exposure to structural vulnerabilities in the host society.[14] For example, immigrants, mostly from non-European regions to Canada, often experience social exclusion and discrimination due to their visible minority status.[18] Immigrants are also often economically more vulnerable to low income, precarious employment, and unemployment.[19] According to Grandner et al,[2] sleep is better understood in the context of the wider social structure; important indicators of social hierarchy such as education, income, and employment often determine sleep quality and other problems related to sleep. For instance, socioeconomic characteristics largely explain why African and Caribbean foreign-born health workers sleep less than their white American-born counterparts.[20] Likewise, immigrants may adapt poor sleep patterns over time due to their relatively disadvantaged position in the host society. To this end, we will test the following hypothesis:

H_2. *Established immigrants report a similar level of troubled sleep with the native-born due to the adoption of unhealthy lifestyles and exposure to structural vulnerabilities.*

Data and analysis

We used data from the 2012 Canadian Community Health Survey–Mental Health (CCHS-MH). This survey is one of the newest cross-sectional surveys available that captures information on a wide range of mental health indicators including troubled sleep. Using 3 sampling frameworks (eg, an area frame, a list frame, and a random digit dialing), the CCHS-MH samples Canadians living in the 10 provinces and 3 territories aged 12 and above. It excludes residents living on reserves, full-time members of the Canadian Forces, and the institutionalized. Given our interest to understand troubled sleep among adults, we excluded people younger than 20 years old from this study. To this end, the final weighted sample includes 25,348,928 Canadians.

Dependent variable

The dependent variable for this study is "troubled sleep." This variable was originally based on a 5-point Likert scale question: How often do you have trouble going to sleep or stay asleep? (0 = none of the time; 1 = a little of the time; 2 = some of the time; 3 = most of the time; 4 = all of the time). However, analyzing this variable in its original state using an ordinal logit model presents serious analytical challenges because some cell sizes are smaller, producing concomitantly high odds ratios (ORs). We also found that the literature commonly adopts troubled sleep as a binary dependent variable in Canada.[11,21,22] To this end, we made a binary variable by recoding "most of the time" and "all of the time" into "troubled sleep" and "none of the time," "a little of time," and "some of the time" into "nontroubled sleep" (0 = nontroubled sleep; 1 = troubled sleep).

Independent and control variables

The independent variable is "length of residence in Canada," measuring how long immigrants have been in Canada since their arrival (0 = native-born; 1 = established immigrants; 2 = recent immigrants). In the literature, it is common to categorize immigrants who have been in Canada for more than 10 years as established immigrants and those who have been in Canada for less than 10 years as recent immigrants.[7,8] We adopted the same coding strategy so that our findings are comparable to the findings from many previous studies with difference health outcomes. Informed by Beiser,[14] we further included 3 sets of control variables, namely, resettlement stress (eg, sex, age of respondents, marital status, visible minority status, level of education, household income, employment status, life satisfaction, and sense of belonging to community), convergence (eg, frequency of smoking, frequency of drinking, and physical activity last week), and immigrant health selectivity (eg, self-rated mental health, self-rated physical health, and any chronic condition).

Statistical analysis

We used 2 different analyses. First, we used univariate analysis to describe sample characteristics for this study. Second, regression analysis was used to understand the relationship between troubled sleep and length of residence in Canada. As shown in Table 1, the higher category of the dependent variable (14%) is much lower than the lower category (86%). In this case, using a simple logit link function that assumes symmetry could potentially produce biased parameter estimates. To address this concern, we used the negative log-log model, which is considered more suitable when the lower category of the dependent variable is more probable than the lower one.[23] We also tested the goodness of fit by comparing Akaike information criteria (AIC) statistics. As we obtained lower AIC statistics for the negative log-log model than logistic regression model, the coefficients estimated from the negative log-log model are considered robust. For regression analysis, models were built sequentially. Model 1 estimates the relationship between troubled sleep and length of residence, whereas we controlled for the resettlement stress perspective, convergence perspective, and immigrant health selectivity in models 2, 3, and 4, respectively. For meaningful interpretations, we reported results with ORs. ORs larger than 1 indicate that people are more likely to report troubled sleep, whereas those smaller than 1 indicate lower odds of doing so. All the analyses were weighted and employed using STATA 15.

Findings

Table 1 shows findings from univariate analysis. We found that 14% of Canadian adults report troubled sleep. In this study, 6% and 20% of the sample were recent and established immigrants, respectively. About a half of respondents were currently married (53%), were currently employed (55%), and had household income higher than $80,000 (48%). It is also noteworthy that 22% were visible minorities and more than three-fifths had university education or higher (64%). Moreover, although the majority reported that they did not smoke at all (79%) and engage in physical activity last week (72%), about three-fifths (61%) report that they drink regularly. Finally, we also found that the majority of the respondents rated their mental (92%) and physical health (85%) to be good, whereas 60% had at least 1 chronic condition.

Findings from regression analysis are shown in Table 2. In Model 1, we found at the bivariate level that recent (OR = 0.70, 95% confidence intervals [CIs] = 0.62-0.79) and established immigrants (OR = 0.86, 95% CIs = 0.79-0.92) were less likely to report troubled sleep than their native-born Canadians. It is noteworthy that the relationship between troubled sleep and length of residence remains statically robust even after controlling for variables capturing the resettlement stress perspective and convergence perspective in Models 2 and 3. However, when we controlled for variables capturing immigrant health selectivity in Model 4, the difference in troubled sleep between recent immigrants and their native-born counterparts became statistically not significant (OR = 0.88, 95% CIs = 0.76-1.02). Established immigrants were less likely to report troubled sleep than the native-born Canadians even after including all the control variables (OR = 0.88, 95% CIs = 0.81-0.96).

In addition to the length of residence, we also found that a wide range of control variables was significantly associated with troubled sleep. For example, men were less likely to report troubled sleep than women (OR = 0.82, 95% CIs = 0.78-0.87). Being dissatisfied (OR = 1.71, 95% CIs = 1.51-1.93) and being neither satisfied nor dissatisfied with life (OR = 1.14, 95% CIs = 1.07-1.21) were more positively associated with reporting troubled sleep than being satisfied with life. Having a very weak sense of belonging to community was also positively associated with troubled sleep (OR = 1.14, 95%

Table 1
Univariate analysis of dependent and independent variables

	Percentage
Troubled sleep	
No	86
Yes	14
Immigrant status	
Native-born	74
Established immigrants	20
Recent immigrants	6
Sex	
Female	51
Male	49
Age of respondents (y)	
60+	26
50-59	20
40-49	20
30-39	17
20-29	17
Marital status	
Never married	21
Divorced/separated	9
Widowed	5
Common-law	12
Currently married	53
Visible minority status	
White	78
Non-White	22
Level of education	
Less than high school	15
High school	15
Some postsecondary education	6
University or higher	64
Household income	
>$20,000	4
$20,000-$39,999	12
$40,000-$59,999	18
$60,000-$79,999	18
<$80,000	48
Employment status	
Unemployed	34
Employed	55
Self-employed	11
Life satisfaction	
Satisfied	36
Neither satisfied nor dissatisfied	55
Dissatisfied	9
Sense of belonging to community	
Very strong	17
Somewhat strong	45
Somewhat weak	28
Very weak	10
Frequency of smoking	
Daily	16
Occasionally	5
Not at all	79
Frequency of drinking	
Regularly	61
Occasionally	18
No drinks in last 12 mo	21
Physical activity last week	
No	28
Yes	72
Self-rated mental health	
Poor	8
Good	92
Self-rated physical health	
Poor	15
Good	85
Any chronic condition	
Yes	60
No	40
Weighted Ns	25,348,928

Table 2
Negative log-log models predicting "troubled sleep" in Canada (N = 25,348,928)

	Model 1	Model 2	Model 3	Model 4
	OR (95% CIs)	OR (95% CIs)	OR (95% CIs)	OR (95% CIs)
Immigrant status				
Native-born	1.00	1.00	1.00	1.00
Established immigrants	0.86 (0.79-0.92)***	0.85 (0.78-0.92)***	0.85 (0.79-0.92)***	0.88 (0.81-0.96)**
Recent immigrants	0.70 (0.62-0.79)***	0.78 (0.67-0.90)***	0.78 (0.67-0.90)***	0.88 (0.76-1.02)
Sex				
Female		1.00	1.00	1.00
Male		0.81 (0.76-0.85)***	0.81 (0.76-0.85)***	0.82 (0.78-0.87)***
Age of respondents				
60+		1.00	1.00	1.00
50-59		1.14 (1.04-1.25)**	1.13 (1.03-1.23)**	1.15 (1.04-1.26)**
40-49		1.00 (0.91-1.10)	0.99 (0.89-1.09)	1.02 (0.92-1.13)
30-39		0.91 (0.82-1.00)	0.90 (0.81-1.00)*	0.95 (0.86-1.05)
20-29		0.91 (0.81-1.02)	0.91 (0.81-1.03)	1.01 (0.89-1.13)
Marital status				
Never married		1.00	1.00	1.00
Divorced/separated		1.07 (0.94-1.21)	1.06 (0.94-1.21)	1.07 (0.94-1.22)
Widowed		1.01 (0.90-1.14)	1.01 (0.90-1.14)	1.03 (0.91-1.17)
Common-law		1.09 (0.96-1.22)	1.08 (0.96-1.21)	1.06 (0.95-1.19)
Currently married		0.99 (0.91-1.07)	1.00 (0.92-1.08)	1.00 (0.92-1.08)
Visible minority status				
White		1.00	1.00	1.00
Non-White		0.93 (0.85-1.01)	0.92 (0.85-1.00)*	0.93 (0.85-1.01)
Level of education				
Less than high school		1.00	1.00	1.00
High school		0.97 (0.87-1.08)	0.99 (0.89-1.10)	1.00 (0.89-1.11)
Some postsecondary education		1.12 (0.95-1.33)	1.14 (0.97-1.35)	1.13 (0.96-1.35)
University or higher		0.95 (0.87-1.05)	0.98 (0.89-1.08)	0.98 (0.89-1.08)
Household income				
<$20,000		1.00	1.00	1.00
$20,000-$39,999		0.99 (0.88-1.11)	0.99 (0.88-1.11)	1.03 (0.92-1.17)
$40,000-$59,999		0.98 (0.87-1.10)	0.98 (0.87-1.11)	1.05 (0.94-1.18)
$60,000-$79,999		0.90 (0.80-1.02)	0.92 (0.81-1.03)	1.00 (0.88-1.12)
>$80,000		0.81 (0.72-0.91)***	0.83 (0.74-0.93)**	0.90 (0.80-1.01)
Employment status				
Unemployed		1.00	1.00	1.00
Employed		0.89 (0.82-0.95)**	0.89 (0.83-0.95)**	0.94 (0.88-1.02)
Self-employed		0.87 (0.79-0.97)**	0.88 (0.79-0.98)*	0.95 (0.85-1.06)
Life satisfaction				
Satisfied		1.00	1.00	1.00
Neither		1.24 (1.16-1.31)***	1.23 (1.16-1.31)***	1.14 (1.07-1.21)***
Dissatisfied		2.33 (2.09-2.60)***	2.28 (2.04-2.54)***	1.71 (1.51-1.93)***
Sense of belonging to community				
Very strong		1.00	1.00	1.00
Somewhat strong		0.97 (0.90-1.06)	0.97 (0.90-1.06)	0.97 (0.90-1.06)
Somewhat weak		1.06 (0.96-1.16)	1.05 (0.96-1.16)	1.03 (0.94-1.13)
Very weak		1.21 (1.08-1.36)***	1.20 (1.07-1.34)**	1.14 (1.02-1.28)*
Frequency of smoking				
Daily			1.00	1.00
Occasionally			0.99 (0.85-1.15)	1.03 (0.88-1.20)
Not at all			0.91 (0.83-1.00)	0.95 (0.87-1.04)
Frequency of drinking				
Regularly			1.00	1.00
Occasionally			1.01 (0.94-1.08)	0.98 (0.91-1.06)
No drinks in last 12 mo			1.02 (0.95-1.10)	0.98 (0.91-1.06)
Physical activity last week				
No			1.00	1.00
Yes			0.93 (0.87-0.99)*	0.98 (0.92-1.05)
Self-rated mental health				
Poor				1.00
Good				0.66 (0.58-0.74)***
Self-rated physical health				
Poor				1.00
Good				0.70 (0.64-0.77)***
Any chronic condition				
Yes				1.00
No				0.73 (0.69-0.78)***
Log pseudo-likelihood	−10,373,870.98	−9,530,750.84	−9,513,495.60	−9,095,231.48
AIC	923.47	848.42	846.88	809.65
Wald χ^2	44.04***	660.05***	683.96***	973.88***

* $P < .05$.
** $P < .01$.
*** $P < .001$.

CIs = 1.02-1.28). Also, health indicators such as good self-rated mental (OR = 0.66, 95% CIs = 0.58-0.74) and physical health (OR = 0.70, 95% CIs = 0.64-0.77) and having at least 1 chronic condition (OR = 0.73, 95% CIs = 0.69-0.78) were associated with troubled sleep.

Discussion and conclusions

Although sleep is recognized as essential to individual health and well-being, the literature pays very little attention to sleep among immigrants in Canada. Drawing a theoretical insight from the healthy immigrant effect, this study addressed this void by comparing troubled sleep among recent immigrants, established immigrants, and the native-born Canadians.

Consistent with our first hypothesis and previous research that shows recent immigrants having low levels of sleep disturbance in Germany,[24] we found that recent immigrants were less likely to report troubled sleep than the native-born Canadians. Interestingly, this difference was completely attenuated when health outcomes such as self-rated mental and physical health as well as chronic conditions were controlled for. This observation may be explained by immigrant health selectivity. Specifically, it is known that the rigorous and comprehensive health screening process often ensures that only prospective immigrants with good health are allowed to migrate to Canada.[14] Therefore, the literature consistently reports that recent immigrants are healthier than the native-born Canadians with regard to self-rated physical and mental health and chronic conditions.[7,8] Considering the relationship between sleep quality and health, we argue that the initial health advantage of recent immigrants in Canada may help explain their better sleep quality compared to the native-born.

Contrary to our second hypothesis, we further found that established immigrants were less likely to report troubled sleep than their native-born counterparts even after adjusting for all control variables. This finding is rather surprising because the literature reports that, through the process of acculturation and exposure to structural challenges such as precarious employment, poor housing, and racial discrimination, immigrants often adopt the unhealthy lifestyle of the native-born and lose their initial health advantage.[18] We provide 2 possible explanations for this finding. For one, this is possibly explained by resilience that immigrants may develop over time to surmount structural barriers in the host society.[25] Some immigrants adopt coping mechanisms against structural barriers such as drawing emotional support from the members of their coethnic network and building strong determination for achieving social and economic success.[26,27] This resilience trajectory may be useful for maintaining sleep quality among established immigrants, although their health often declines over time in Canada. For another, there may be a cultural difference in interpreting troubled sleep. It is demonstrated that immigrants in Australia attribute disturbed sleep to physical tiredness, whereas their native-born counterparts believe that that it is reflective of psychological distress.[28] It is possible that established immigrants maintain culturally different understandings of health behaviors including sleep, resulting in reporting fewer cases of troubled sleep than the native-born Canadians.

Although not the focus of this study, we also found that some social and behavioral factors were significantly associated with troubled sleep. For example, men were less likely to report troubled sleep than women. This may be explained by Lindberg et al,[29] who argue that sex differences in sleep quality may be partly attributed to psychological outcomes such as anxiety and depression. Moreover, Krishnan and Collop[30] show that differences in sleep quality are attributed to physiological differences. Specifically, with the onset of puberty especially for women, their lower quality of sleep is also explained by menstrual cycle, pregnancy, and menopause, directly affecting the "architecture" of their sleep. Furthermore, people with lower levels of life satisfaction and sense of belonging to community reported more cases of troubled sleep. These findings are consistent with previous studies[31,32] observing that the sense of belonging and life satisfaction may act as a protective cover against physical and mental distress that can negatively impact sleep quality.

Despite the important contributions of this study, there are some limitations. First, as noted earlier, troubled sleep may be culturally constructed. Thus, it is recommended for future research to examine how the patterns of troubled sleep may vary among the immigrants with a different racial/ethnic background. Unfortunately, we used a publicly available version of the CCHS-MS and had limited information on visible minority status as a binary variable, capturing whites and visible minorities. It is also important to qualitatively document immigrants' voices on troubled sleep to provide more insight in understanding how the meanings of troubled sleep are socially and culturally constructed. In addition, we used self-reported troubled sleep as an only measure of sleep quality. Future research should integrate other subjective and clinical indicators such as sleep duration and daytime sleepiness. Another limitation is the cross-sectional nature of the CCHS-MS. Considering that established immigrants came to Canada under different social, economic, and political conditions than recent immigrants, it is also important to explore the role of cohort effect on troubled sleep. In this sense, future research should use a longitudinal analysis to capture the intraindividual variations on troubled sleep over time among immigrants.

Conflict of interest

We declare that there is no conflict of interest.

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