HHS Public Access

Author manuscript

Sleep Health. Author manuscript; available in PMC 2023 April 01.

Published in final edited form as:

Sleep Health. 2022 April ; 8(2): 249–254. doi:10.1016/j.sleh.2021.11.008.

The Association between Traumatic Life Events and Insomnia Symptoms among Men and Women: Results from the Baltimore Epidemiologic Catchment Area Follow-Up Study

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Abstract

Study Objectives: Trauma exposure likely contributes to poor sleep, but relatively few studies have empirically tested this, instead focusing on posttraumatic stress disorder. Moreover, little is known about sex differences in sleep after trauma. The current study used a cross-sectional and retrospective design to test hypotheses that trauma exposure would be associated with subsequent insomnia symptoms, particularly among women, even after accounting for important covariates.

Method: Data from Wave 3 (1993–1996) of the Baltimore Epidemiologic Catchment Area Study (N=1920) were used to examine associations between remote (prior to past year) and recent (past year) trauma and current sleep disturbance (insomnia, hypersomnia symptoms) in the total sample (M_{age}= 55, 63.2% women, 57.7% white), and separately in men and women. Sensitivity analyses were conducted among individuals with no pre-trauma sleep disturbance to examine incident sleep disturbance.

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Non-financial Disclosure: The authors have no other conflicts of interest to disclose.

Financial Disclosure: Adam Spira received an honorarium as a consultant to Merck, and honoraria from Springer Nature Switzerland AG for guest editing special issues of *Current Sleep Medicine Reports*.

Results: Among all participants, both remote (OR=1.95, 95% CI [1.34, 2.85]) and recent (OR=1.94, 95% CI [1.31, 2.87) trauma exposure were associated with increased odds of insomnia (OR=2.41, 95% CI [1.54, 3.76]) but not hypersomnia. Associations between trauma and insomnia were particularly strong among women, but null among men. The relationship between trauma exposure and insomnia symptoms persisted among individuals with no pre-trauma history of insomnia.

Conclusion: Results suggest women may be vulnerable to insomnia symptoms as sequelae of trauma. Future research should examine prospective associations between trauma and sleep in larger samples and how assessment and treatment of insomnia among women trauma survivors reduces the public health impact of trauma and poor sleep.

Keywords

sleep; trauma; insomnia; gender differences

Introduction

Sleep plays a critical role in physical and psychological health,[1] yet is an often overlooked public health issue. National data indicate that poor sleep is prevalent among adults in the United States (U.S.), with an estimated 50–70 million suffering from a sleep disorder, most commonly insomnia disorder.[2] Importantly, sleep problems such as insomnia symptoms are associated with a range of poor physical, behavioral, and mental health outcomes including cardiovascular disease,[3] depression,[4] cognitive impairment,[5] and injuries.[6] Moreover, several studies show a graded association between sleep disturbance and health outcomes, such that as the severity of sleep problems increases, the risk for adverse outcomes also increases.[2] The magnitude and potential adverse consequences of insomnia symptoms underscore the importance of research focused on understanding the etiology of insomnia to inform clinical practice and treatment, and identify promising directions for prevention and intervention.

Exposure to traumatic events is an important potential contributor to insomnia symptoms. The Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines trauma exposure as “actual or threatened death, serious injury, or sexual violence,” such as physical and sexual assault, witnessing violence, receiving threats, and experiencing a natural disaster or accident.[7] Trauma exposure is common in the U.S., with national estimates indicating that 40–90% of U.S. adults have experienced at least one traumatic event in their lifetime. [8,9] A large body of research suggests that posttraumatic stress disorder (PTSD) is associated with poor sleep, including high rates of insomnia (i.e., difficulty falling or staying asleep paired with daytime dysfunction).[10] However, less research has examined the temporal association between trauma exposure itself, independent of PTSD, and sleep disturbance.[11] A systematic review of the empirical literature published in 2010 found only four studies on the topic, indicating that trauma exposure is associated with greater difficulties trouble falling asleep, staying asleep, and falling back to sleep after awakening, with medium to large effects.[11]

Recent research since the 2010 review was published also provides support for an association between trauma exposure and insomnia symptoms.[12–17] In a large cohort of U.S. women, those who had experienced a traumatic event in childhood were more likely to sleep fewer hours, have a longer average time to fall asleep, wake up more often during the night, and take more frequent naps compared to women with no childhood trauma exposure.[14] However, men were not included in analyses. An additional study found that a greater number of childhood traumas was associated with an increasing likelihood of sleep problems in adulthood.[13] Similarly, in a cohort of students entering their first year of college, prior interpersonal trauma, including physical or sexual assault or other unwanted sexual experiences, predicted disturbed sleep, as measured by sleep duration, time to fall asleep, daytime sleepiness, and sleep quality.[15] However, this study was specific to interpersonal trauma exposure. Among adolescents ages 12–15 years, childhood trauma and recent stressful life events were associated with less sleep regularity and more sleep disturbances (i.e., nightmares, sleeping less, difficulty sleeping).[12] Importantly, many of these studies adjusted potential confounding by mental health symptoms, including depression and anxiety, suggesting that trauma may influence sleep above and beyond the potential effects of emotional distress.[12–14] Despite strengths of these studies, none to our knowledge evaluated impacts of various types of trauma on the sleep of adult men and women.

While the extant literature substantially advances our understanding of the potential impact of trauma exposure on sleep, there are notable gaps. Early research is limited by lack of ability to establish temporality between measures of traumatic events and sleep disturbances.[11] More recent research is limited by a primary focus on childhood trauma and less attention to the potential impact of trauma exposure in adulthood on sleep.[12–15] Moreover, little research to date has assessed potential differences in associations between trauma and sleep among men and women. This is despite women being more likely than men in general to endorse sleep problems, including difficulties initiating and maintaining sleep. However, only one study to date to our knowledge examined gender differences in the association between sleep and trauma, and suggested women's sleep is more impaired by trauma than men's.[18–20]

The aims of this study were to examine the association of adult trauma exposure both prior to (i.e., remote) and within the past year (i.e., recent) with insomnia and hypersomnia symptoms and to assess for differences in associations between men and women. Based on prior research,[11,18] we hypothesized that remote and recent trauma would increase risk for insomnia symptoms (e.g., difficulty falling asleep, staying asleep, or waking up too early), but not for hypersomnia symptoms. Prior research indicates that women's sleep may be more impacted by stress, [21] including traumatic stress, [18] compared to men, which may be due to the higher prevalence of sleep complaints in women in general, as well as increased levels of stress,[22] and the negative emotional and physiological consequences of stress among women compared to men. [23] Therefore, we also hypothesized that associations would be stronger among women compared to men,[18] and that associations would hold even among adults with no history of insomnia symptoms prior to trauma exposure (i.e., incident symptoms, post-trauma). Finally, we hypothesized these associations would hold even when accounting for relevant demographic differences and lifetime history of major depressive

episodes (MDEs), which can be a confounding factor associated with both trauma exposure and sleep disturbance.

Methods

Participants and Procedures

Data from the current study were drawn from the Baltimore site of the Epidemiologic Catchment Area (ECA) Study. The ECA was developed by the National Institute of Mental Health to estimate the prevalence, incidence, and treatment seeking for psychopathology over the adult lifespan using representative samples of participants from local areas who were interviewed regarding their mental health.[24] Other sites included New Haven, St. Louis, Raleigh/Durham, and Los Angeles. The Baltimore ECA enrolled 3,481 residents of East Baltimore for its initial wave of interviews in 1981 (Wave 1), and then completed follow-ups as possible in 1982 (Wave 2; $n = 2768$), 1993–1996 (Wave 3; $n = 1920$), and 2003–2004 (Wave 4; $n = 1071$). Of those who were missing in the third wave (n=1561), 848 died (24%), 415 were not located (16% of survivors), and 298 refused to participate (13% of located). More details on the study design as well as attrition rates and reasons for attrition can be found elsewhere.[25,26] In brief, non-response to the follow-up surveys was predicted by psychopathological conditions that were associated with increased mortality (e.g., bipolar disorder, substance use disorder, cognitive impairment, antisocial personality disorder), demographic factors (e.g., lower income, unemployment, widowed/single, male, 65 years of age or older, white, lower education), and household factors that predicted either increased mortality risk or non-response/refusal (e.g., living alone).[25] For the current study, data from Wave 3 were used due to inclusion of relevant measures of stressors, trauma, and sleep (N = 1,920). All participants provided written informed consent. The Baltimore ECA study was conducted in accordance with the Johns Hopkins Bloomberg School of Public Health Institutional Review Board and in compliance with the Declaration of Helsinki.

Measures

Demographics.—Demographic information, including participant age, marital status, highest level of education, and annual household income was collected via structured interview. Sex as observed was indicated by interviewers. Race and ethnicity were collected via interview in previous waves.

Traumatic Life Events.—At Wave 3 (1993–1996), participants completed a structured interview that included assessment of whether they had experienced specific traumas either: 1) within the last year; or 2) between 1981 (Wave 1) and more than one year ago. Specifically, participants were asked whether they had experienced any of the following traumas: combat exposure, accident, physical attack, rape, mugging/theft, witnessing another person being hurt or killed, learning of an unexpected death or injury of a loved one, receiving threats or experiencing a close call, or natural disaster (e.g., flood, tornado, serious storm). Of note, these traumatic events continue to meet current definitions of trauma exposure as defined by the DSM-5.[7] For the index trauma, participants were then probed for the year in which this event occurred and for brief details regarding the event. For those with multiple traumas, only the index trauma was included as a predictor variable; data were not

available regarding total number of traumas. For current analyses, “remote” trauma exposure since 1981 was coded as 0 (no trauma between 1981 and past year) or 1 (trauma exposure between 1981 and past year); “recent” past year trauma exposure was coded as 0 (no past year trauma) or 1 (past-year trauma exposure).

Lifetime MDE.—Lifetime MDE was assessed using the Diagnostic Interview Schedule (DIS).[27] The DIS is a structured clinical interview that was administered by trained laypersons to assess for Diagnostic and Statistical Manual-III-R psychological disorders, including MDE.[27] Participants were asked about symptoms of depression occurring within a two-week period at any point in their lifetime. Those who met criteria for MDE at any point were considered to have a lifetime history of MDE for the current study.

Insomnia and Hypersomnia Symptoms.—As part of the DIS MDE assessment, all participants in Wave 3 (regardless of the presence of MDE) completed a semi-structured interview of sleep in which they were asked: 1) whether they had at least two weeks “when nearly every night…[they] had…trouble falling asleep, staying asleep, or waking up too early” (insomnia), 2) whether they had “two weeks or more when nearly every morning …[they]…would wake up at least 2 hours before…” desired; and 3) whether they “had two weeks or longer when nearly every day…” they were “sleeping too much” (hypersomnia). Positive endorsements were further queried for the timing of the sleep disturbance and age of first onset. For current analyses, past-two-week and past-year (including in the past two weeks) sleep disturbances were coded as separate variables with values of 0 (no sleep disturbance) or 1 (sleep disturbance) for insomnia and hypersomnia symptoms.

Data Analytic Plan

Primary analyses were conducted in MPlus Version 8.3.[28] First, descriptive and comparative analyses across trauma groups were conducted, including chi-square and ANOVA (for variables with >2 groups) to compare characteristics of individuals with no, remote, or recent trauma exposure. Demographics variables with significant differences between groups were selected for use as covariates. Then, logistic regression was used to examine the association of remote or recent trauma exposure with insomnia and hypersomnia symptoms (which were binary, no sleep problem = 0 and sleep problem = 1), adjusting for participant age, marital status (not married = 0; married = 1), highest grade level achieved (e.g., 12 = high school degree = 12; college degree = 16), and lifetime history of MDE (no history of MDE = 0; met criteria for MDE at any point during participants’ lifetime = 1). For remote trauma, past-year sleep disturbances were the outcome while past-two-week sleep disturbances were the outcome for recent trauma to ensure the trauma occurred prior to the reported sleep disturbances.

Stratified and sensitivity analyses were conducted identically as above in the specified samples. In stratified analyses, analyses were conducted separately for women and men due to our *a priori* hypothesis that women’s sleep may be more impacted by trauma than men’s. Moderation analyses were not conducted because an interaction term alone, without examining the prevalence of the exposure and outcome in each population, can hide important differences that are contributing to disparities in outcomes in epidemiological

research.[29] In sensitivity analyses, any participant whose age of first onset of insomnia symptoms was prior to reported trauma exposure (i.e., the year before Wave 3 for recent trauma or since 1981 for remote trauma) was removed. Remaining participants' Waves 1 and 2 data (n=1842 for no insomnia symptoms prior to 1981; n=1643 for no insomnia symptoms prior to past year) were then examined to confirm no reported insomnia in the context of an MDE (insomnia outside of MDE was not queried in those waves), and any who reported insomnia symptoms in Waves 1 and 2 were then removed, resulting in a sample size of 1569 with no insomnia symptoms prior to 1981 and 1397 with no insomnia symptoms prior to the past year. Odds ratios (ORs) were interpreted as 1.68 = small; 3.47 = medium; and 6.71 = large.[30] 95% confidence intervals (CIs) were used to determine significance, with CIs that do not cross through one being considered statistically significant.[31] Item-level missing data were handled using maximum likelihood estimation.

Results

Preliminary Analyses

Demographic and clinical characteristics by participants' trauma exposure type (i.e., none, 57.7% of the sample; remote, 24.2%; recent, 18.1%) are described in Table 1. Average ages across the three trauma exposure groups ranged from 50 to 58 years, with remotely (p<.001) or recently (p<.001) trauma-exposed participants being significantly younger than unexposed participants. Participants were by majority women. Most participants were white (56.2–60.9%), followed by Black (22.7–26.6%), and other (e.g., Asian, Native American, Pacific Islander; 12.5–21.0%). Average grade level achieved was 11th grade, with slightly lower education levels for those without any trauma exposure. Mean income levels were about $15k-$18k. Nearly half of participants (48.4–49.2%) were married. A small proportion met criteria for a lifetime MDE across groups (7.3–17.5%), with higher MDE among individuals with no or recent trauma exposure. For those with remote or recent trauma exposure (n = 812), traumas endorsed were: news of an unexpected death or injury of a loved one (34.7%), other trauma exposure (27.5%), accident (15.6%), theft (10.8%), witnessing someone being injured (10.7%), threat or close call (6.0%), physical attack (4.1%), storm (2.2%), witnessing a threat or close call (1.8%), sexual assault (0.7%), flood (0.5%), and combat (0.1%). Rates of insomnia symptoms in the past year ranged from 6.2–18.4%, while hypersomnia symptoms were reported by between 1.7 and 4.5% of participants (Table 1).

Primary Analyses

Association between remote trauma and current sleep.—Compared to participants without remote trauma, those with remote trauma had two times the odds of insomnia symptoms (OR = 1.95, 95% CI [1.34, 2.85]; Table 2), and over 2.5 times the odds of hypersomnia (OR = 2.61, 95% CI [1.33, 5.11]). In these adjusted models, covariates were not significantly associated with sleep outcomes, with the exception of lower education being associated with higher levels of hypersomnia (OR = .90, 95% CI [.81, .99]).

Association between recent trauma and current sleep.—Those with recent trauma had about 2 times the odds of insomnia symptoms (OR = 1.94, 95% CI [1.31, 2.87). There

was no significant effect of recent trauma on hypersomnia symptoms (OR = 1.51, 95% CI [.63, 3.65]). Covariates were not associated with sleep outcomes.

Stratified Analyses

Men.—A quarter (24.5%) of men reported remote trauma exposure. There was not a significant association between remote trauma and insomnia symptoms (OR = 1.38, 95% CI [.70, 2.74]); Table 3) for men. Further, 14.7% of men reported recent trauma, but there was no significant association between recent trauma and insomnia symptoms (OR = .51, 95% CI [.15, 1.70]), or hypersomnia symptoms (OR = 1.23, 95% CI [.25, 5.93]). Covariates were not associated with sleep outcomes.

Women.—A quarter (24.1%) of women reported remote trauma exposure. Women with remote trauma had about 2 times the odds of insomnia symptoms (OR = 2.26, 95% CI [1.42, 3.60]), and higher odds for hypersomnia symptoms (OR = 3.15, 95% CI [1.30, 7.63]). Recent trauma was reported by 20.0% of women, who had over 2 times the odds of insomnia symptoms (OR = 2.43, 95% CI [1.56, 3.76]). There was no significant association between recent trauma and hypersomnia symptoms (OR = 1.63, 95% CI [.55, 4.86]). Covariates were not significantly associated with sleep outcomes (ps > .119).

Sensitivity Analyses

We conducted sensitivity analyses among individuals who retrospectively denied history of sleep disturbance prior to trauma exposure, confirmed via examining Waves 1 and 2 data and removing any individuals who reported sleep disturbance in these waves. In this group, 23.5% endorsed remote trauma exposure. Consistent with the full sample, those with remote trauma exposure had twice the odds of incident insomnia symptoms (OR = 2.20, 95% CI [1.41, 3.44]; Supplementary Table 1). However, there was no association with hypersomnia symptoms (OR = .80, 95% CI [−1.14, .68]). Regarding recent trauma, 16.4% indicated exposure, but the effect of recent trauma on insomnia symptoms was not significant (OR = 2.01, 95% CI [.83, 4.85]). There was no association with hypersomnia symptoms (OR = .76, 95% CI [.17, 3.48]).

Discussion

The current study examined associations between trauma exposure in adulthood and subsequent sleep disturbance in a large sample of 1,920 adult men and women participating in the population-based Baltimore ECA Follow-Up study. Results indicate that, consistent with hypotheses and prior research,[11,16–18] adults who experienced trauma have two times the odds of insomnia symptoms compared to adults with no trauma exposure. Providing further confidence for these findings, associations persisted after adjusting for age, marital status, education, and lifetime history of MDE. Results suggest that recent and remote traumas in adulthood impair sleep to a similar degree. This aligns with prior research demonstrating that childhood or adolescent trauma exposure is a predictor of adulthood sleep disturbance years or decades later.[12–14] Generally, there were few differences between the effects of recent vs. remote trauma on insomnia symptoms, suggesting the timing of trauma exposure may not be an important factor in associations between trauma and sleep.

Finally, consistent with hypotheses, the association between trauma and sleep disturbance was fairly specific to insomnia symptoms, and not associated with hypersomnia.

As hypothesized, women with remote and recent trauma had about two to three times the odds of insomnia symptoms. This is consistent with prior research highlighting the high levels of sleep disturbance experienced by women,[19,20] and with limited research suggesting that stress and trauma exposure may impair women's sleep more than men's.[18, 21] Women with remote trauma also had slightly higher odds for hypersomnia although CIs were relatively wide, so this finding should be interpreted with caution. Women exposed to remote trauma may be more likely to develop depression over time,[32] which in turn increases risk for hypersomnia;[33] however, lifetime MDEs were a covariate in analyses. A recent twin study also suggested that PTSD may be associated with both short and long sleep duration,[16] though hypersomnia was not formally assessed. More research is needed to clarify whether hypersomnia is a sequela of trauma among women.

Despite similar rates of trauma exposure, trauma was not associated with sleep disturbance among men. This was somewhat surprising because we expected an association between trauma and sleep to remain in men, albeit in attenuated form. Many prior studies of the effects of trauma exposure on sleep did not consider gender differences,[11] but, for recent studies that have, men do report sleep disturbances posttrauma, even if they are less severe than women's.[34] One possible explanation for our discrepant findings is that men's sleep disturbances after trauma are more commonly parasomnias (unwanted experiences occurring prior to and during sleep or upon awakening, including nightmares), which were not assessed in the current study.[35,36] Future research should include assessments of these types of sleep disturbances as well.

Sensitivity analyses revealed that even among individuals who retrospectively denied sleep disturbances prior to trauma exposure, confirmed via examination of waves 1 and 2 data, remote trauma was associated with twice the odds of insomnia symptoms. These findings provide greater confidence in the temporal patterning of trauma exposure occurring prior to sleep disturbance, rather than vice versa. These findings also indicate that even in mid-life, after the typical age of onset for insomnia symptoms and when incident insomnia symptoms are often associated with health-related factors such as medical illness and pain,[37] individuals continue to be vulnerable to developing insomnia symptoms after trauma exposure. In this stage of the lifespan, trauma exposure may interact with developmental changes in sleep as the duration and depth of sleep reduces.[38]

The current study has clinical implications. Specifically, results highlight the need for assessment and secondary prevention strategies for insomnia symptoms after trauma, particularly among women. This is particularly important in the context of research suggesting that women are also more vulnerable to other negative sequelae of traumatic events, such as PTSD and related psychopathology,[39] disease processes that could be mediated in part by disruptions in sleep.[40] Fortunately, insomnia can be effectively treated using brief behavioral strategies, including Cognitive Behavioral Therapy for Insomnia (CBT-I),[41] which also provide improvements in quality of life. Moreover, the assessment and treatment of insomnia symptoms posttrauma could potentially have other downstream

benefits, such as mitigating the development of posttrauma psychopathology or cognitive decline.[40]

Results from the current study should be considered in the context of its limitations and directions for future research. First, although a well-validated structured interview was conducted to assess for psychopathology,[27] individuals were not assessed for PTSD. Thus, it is possible the association between trauma and sleep disturbance is mediated by PTSD. However, results persisted after covarying for MDE, which often co-occurs with PTSD and shares similar symptoms, providing somewhat increased confidence that PTSD alone does not explain associations between trauma and sleep disturbance. Similarly, data regarding traumas that occurred prior to 1981 were not available, and data were not available regarding the timing of trauma in the life course (i.e., data only indicate whether traumas occurred more or less than one year ago; therefore timing could only be calculated roughly for traumas occurring less than one year ago). Future research should examine the impact of childhood/more remote traumatic event exposure on sleep, and whether the timing of trauma (e.g., when timing occurred in the individual's life course) impacts is effects on sleep. Second, the current study utilized retrospective assessment to determine age of onset of sleep disturbance and year of trauma exposure combined with a prospective confirmation of whether participants reported sleep problems at Waves 1 or 2. This was conducted in the context of a well-validated structured interview, but it is still possible that memory biases (typically toward forgetting past mental illness)[42] could affect participants' responding to these questions and that insomnia symptoms could have been experienced outside of the context of an MDE, therefore missed when examining Waves 1 and 2 data. Fully prospective studies would overcome this limitation. Third, the proportion of men with recent trauma exposure was relatively low. The lack of any association between trauma and sleep in men should be interpreted with some caution as we may have been underpowered to detect a smaller effect among men. Fourth, the data included in the current study was collected in 1993–1996, so these data are somewhat dated. However, data collection for the Baltimore ECA study is ongoing and when data collection for the current wave is finalized, we hope to provide more intensive data on the associations between trauma exposure and sleep disturbance. Consistent with the timing of data collection, questions regarding trauma exposure may not be fully consistent with the current definition of trauma in the DSM-5. Although the specific traumas queried generally can still be considered DSM-5 traumas, it is possible that some may not fulfill the requirements of DSM-5 trauma exposure. For example, close call may or may not involve direct threat of injury, death, or sexual violence, and death of a loved one must have been violent or accidental to qualify as a traumatic event. Further, items did not directly ask whether participants may have been exposed to repeated or extreme exposure to aversive trauma details as part of their occupation, which is now a possible trauma exposure in the DSM-5.[7]

The current study adds to the literature on sleep disturbances following trauma by suggesting that both remote and recent trauma exposure are associated with about two times the odds of later insomnia symptoms, particularly among women. These associations were robust to covariates and sensitivity analyses. Of note, in the current sample, there were not racial differences in trauma exposure or sleep disturbance. However, racial disparities in these outcomes are commonly found and should be considered in future research. Findings

highlight the role of trauma in the development of insomnia symptoms, and underscore the opportunity to develop secondary prevention strategies, particularly for women, to reduce the public health burden of poor sleep in the US.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments:

The authors would like to thank Kaathya Kashyap for assistance with manuscript formatting.

Source of funding:

This work was funded in part by the National Institute of Mental Health grants #MH47447 and T32MH014592, and the National Institute on Aging grant AG052445.

Data availability:

ECA data are available from Adam P. Spira, Ph.D. following approval of a manuscript proposal and execution of a data use agreement.

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Table 1.

Demographic and clinical characteristics of the sample.

	No Trauma (*n* = 1108) *n* (%) or *M* (SD)	**Remote Trauma (*n* = 465) *n* (%) or *M* (SD)**	**Recent Trauma (*n* = 347) *n* (%) or *M* (SD)**	***p***
Age	58.34 (17.46)	50.11 (15.23)	51.19 (15.25)	<.001
Women	678 (61.2%)	292 (62.8%)	243 (70.0%)	.012
Race				.155
White	708 (58.3%)	361 (56.2%)	39 (60.9%)	
Black	302 (24.9%)	146 (22.7%)	17 (26.6%)	
Other	204 (16.8%)	135 (21.0%)	8 (12.5%)	
Latino/Latina Ethnicity	11 (1.0%)	2 (0.5%)	15 (0.6%)	.457
Highest grade level achieved	11.03 (3.15)	11.94 (3.00)	11.65 (2.66)	<.001
Income	$17.5k–$19.9k	$17.5k–$19.9k	$15k–$17.5k	.086
Marital status				.013
Married	472 (49.2%)	225 (48.4%)	168 (48.4%)	
Widowed	188 (19.6%)	65 (14.0%)	51 (14.7%)	
Separated	64 (6.7%)	31 (6.7%)	24 (7.2%)	
Divorced	124 (12.9%)	57 (12.3%)	50 (14.4%)	
Never married	112 (11.7%)	87 (18.7%)	53 (15.3%)	
Lifetime MDE	194 (17.5%)	34 (7.3%)	41 (11.8%)	<.001
Past year insomnia	69 (6.2%)	59 (12.7%)	64 (18.4%)	<.001
Past year hypersomnia	19 (1.7%)	21 (4.5%)	13 (3.7%)	.004

Note. Comparisons and ensuing *p* values were conducted using ANOVA for continuous outcomes and χ^2 for categorical outcomes. Other race included the small proportion of individuals identifying as Native American, Asian, Pacific Islander, and Latino/Latina. MDE = Major depressive episode.

Table 2.

Association between remote and recent traumatic life events on sleep.

	OR	95% CI	SE	*p*
Remote Trauma				
Insomnia	1.95	1.34, 2.85	.38	.012
Hypersomnia	2.61	1.33, 5.11	.90	.073
Recent Trauma				
Insomnia	1.94	1.31, 2.87	.39	.015
Hypersomnia	1.51	.63, 3.65	.68	.456

Note. Analyses adjusted for age, education level, marital status, and lifetime history of major depressive episode. Outcomes for remote trauma are past year; outcomes for recent trauma are past two weeks.

Table 3.

Stratified analyses of association between remote and recent trauma exposure on sleep by gender.

	OR	95% CI	SE	*p*
Remote Trauma				
Men				
Insomnia	1.38	.70, 2.74	.48	.429
Hypersomnia	1.95	.64, 5.89	1.10	.390
Women				
Insomnia	2.26	1.42, 3.60	.54	.019
Hypersomnia	3.15	1.30, 7.63	.45	.011
Recent Trauma				
Men				
Insomnia	.51	.15, 1.70	.31	.112
Hypersomnia	1.23	.25, 5.93	.99	.817
Women				
Insomnia	2.43	1.56, 3.76	.54	.009
Hypersomnia	1.63	.55, 4.86	.91	.489

Note. Analyses adjusted for age, education level, marital status, and lifetime history of major depressive episode. Outcomes for remote trauma are past year; outcomes for recent trauma are past two weeks.