Frequent Insufficient Sleep and Anxiety and Depressive Disorders Among U.S. Community Dwellers in 20 States, 2010

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Objective: **This investigation examined the association of anxiety or depressive disorder and frequent insufficient sleep.** ***Methods:*** **Data were obtained from a 2010 telephone survey of a population-based sample of 113,936 adults in 20 states. Respondents were asked how often they did not get enough rest or sleep and if they had ever received a diagnosis of an anxiety or depressive disorder. Frequent insufficient sleep was defined as insufficient rest or sleep during ≥14 of the past 30 days.** ***Results:*** **Frequent insufficient sleep was reported by 27.0% of the sample and was significantly more common ($p<.05$) among respondents who reported both anxiety and depressive disorders (48.6%), depressive disorders only (39.0%), or anxiety only (37.5%) than among adults who reported neither disorder (23.1%).** ***Conclusions:*** **Frequent insufficient sleep is associated with depressive and anxiety disorders, and the odds of the sleep disorder are increased when both classes of psychiatric disorders are diagnosed. (*Psychiatric Services* 64:385–387, 2013; doi: 10.1176/appi.ps.201200226)**

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Sleep disturbance is well documented in psychiatric nomenclature as a facet of depression. Specifically, *DSM-IV* diagnostic criteria for major depressive episode include experiencing insomnia or hypersomnia nearly every day for two weeks (1).

Research on rats suggests that chronic sleep restriction may foster changes in neuroendocrine reactivity, as well as in neurotransmitter receptor systems, similar to those evident in depression (2). These findings suggest that restricted or disrupted sleep may contribute to psychiatric symptomatology (2). Corroborating these results, Nakata (3) found that insufficient sleep—defined as fewer than six hours per day—coupled with increased work hours, was associated with an increase in depression and attributed the increase primarily to sleep deprivation. Of particular concern, suicidal behavior among youths has been associated with insomnia, with depression likely assuming a mediating role between these two factors (4).

Anxiety symptomatology has also been associated with insufficient sleep (5). A population-based investigation of 79,625 adults found that 26% reported frequent insufficient sleep, defined as not getting enough rest or sleep for 14 or more of the past 30 days. Frequent insufficient sleep was associated with increased anxiety, depressive symptomatology, activity limitations, and fair or poor general health (6). In a review by Hirschfeld (7), anxiety and depression were found to frequently co-occur. This comorbidity was associated with increased rates of psychiatric hospitalization, chronicity, and recurrence, as well as with slower recovery.

To address the association of comorbid anxiety and depression within the specific domain of sleep, we examined the association between self-report of having received from a health care provider diagnoses of anxiety and depressive disorders and self-reported frequent insufficient sleep in a large population-based sample of adults.

Methods

Data were obtained from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS; www.cdc.gov/brfss), a population-based survey of noninstitutionalized, civilian, U.S. adults age 18 years or older. In 2010, a total of 123,691 respondents from 20 states (Arizona, California, Georgia, Hawaii, Idaho, Kansas, Louisiana, Maine, Massachusetts, Michigan, Mississippi,

Missouri, Nebraska, Nevada, New Jersey, Ohio, South Carolina, Vermont, Wisconsin, and West Virginia) completed both the BRFSS core questionnaire and an optional mental health module in a landline phone interview.

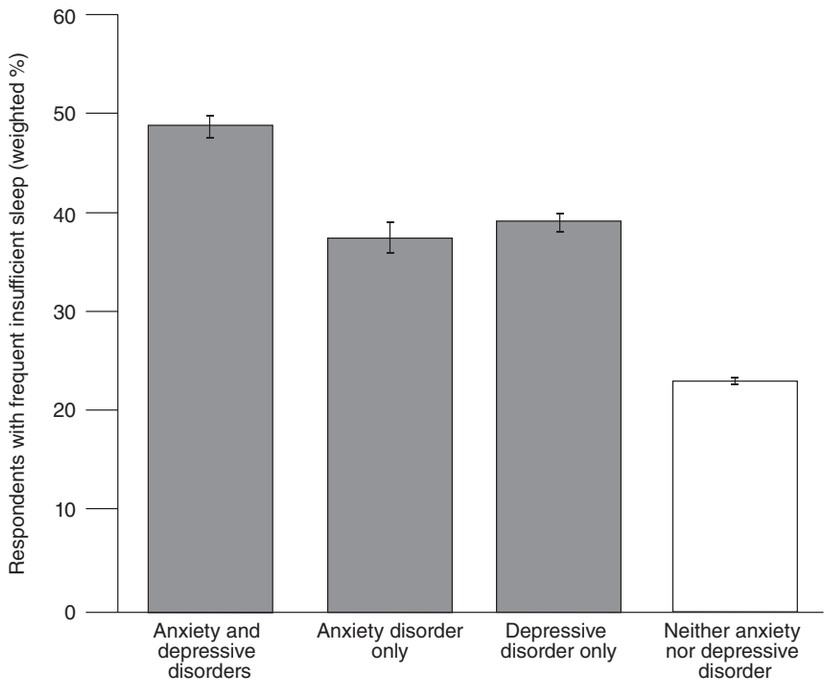
The sleep question was, "During the past 30 days, for about how many days have you felt you did not get enough rest or sleep?" Respondents who reported experiencing 14 days or more of insufficient sleep or rest were defined as suffering from frequent insufficient sleep. We excluded respondents for whom data on sleep (N=2,368) and anxiety or depressive disorders (N=7,387) were missing. After these exclusions, data from 113,396 adults (92.1%) were available for analysis.

Respondents were asked the following questions: "Has a doctor or other health care provider ever told you that you had an anxiety disorder (including acute stress disorder, anxiety, generalized anxiety disorder, obsessive-compulsive disorder, panic disorder, phobia, posttraumatic stress disorder, or social anxiety disorder)?" and "Has a doctor or other health care provider ever told you that you have a depressive disorder (including depression, major depression, or dysthymia)?" On the basis of their responses, participants were categorized into one of the following groups: anxiety disorder only, depressive disorder only, both anxiety and depressive disorders, and neither disorder.

The likelihood of frequent insufficient sleep being associated with anxiety disorder or depressive disorder status was assessed by using the prevalence ratio (PR) and 95% confidence interval (CI) that were obtained from a multivariate logistic regression model after controlling for variables that we have previously identified as important confounders (age, gender, race-ethnicity, education, employment, and marital status) (6). SAS-callable SUDAAN was used to account for the complex study design, with statistical significance denoted as $p<.05$.

Figure 1

Association between diagnosis of anxiety and depressive disorder and frequent insufficient sleep



Source: 2010 Behavioral Risk Factor Surveillance System. Frequent insufficient sleep is insufficient rest or sleep for ≥14 of the past 30 days. The adjusted odds of frequent insufficient sleep were 1.89 (95% CI=1.77–2.01) among patients with anxiety and depressive disorders, 1.54 (95% CI=1.41–1.68) among adults with anxiety only, and 1.62 (95% CI=1.52–1.73) among adults with depressive disorder only (reference: neither anxiety or depressive disorder). Prevalence ratios were adjusted for age, sex, race-ethnicity, education, marital status, and employment status. Diagnoses are self-reports of clinician diagnoses.

Results

Among 113,936 respondents, 17.8% were 65 years or older, 51.3% were women, 71.2% were non-Hispanic white, 12.5% were Hispanic, and 8.4% were non-Hispanic black. Of the respondents, 9.7% had fewer than 12 years of education, 26.7% reported some college education, and 37.0% were college graduates. Most respondents (56.7%) were employed, 17.0% were retired, 12.4% were grouped in the "other" category (homemaker or student), 8.8% were unemployed, and 5.1% were unable to work; 62.2% of respondents reported that they were married. Respondents were categorized as reporting anxiety only (4.6%), a depressive disorder only (7.8%), both disorders (8.0%), or neither disorder (79.7%).

Frequent insufficient sleep was reported by 27.0% of respondents. Adults with anxiety were more likely than those without anxiety to report frequent insufficient sleep (44.5% versus 24.5%; adjusted PR [APR]=1.60; 95% CI=1.52–1.68, $p<.05$). Similarly, adults with depressive disorders were more likely than those without these disorders to report frequent insufficient sleep (43.9% versus 23.9%; APR=1.65; 95% CI=1.57–1.73, $p<.05$).

As Figure 1 reveals, the highest prevalence of frequent insufficient sleep was observed among respondents who reported both disorders (48.6%), followed by respondents who reported depressive disorders only (39.0%), anxiety disorders only (37.5%), and neither disorder (23.1%). After multivariate adjustment, the analysis showed that persons with both disorders were 89% more likely than those with neither disorder to report frequent insufficient sleep ($p<.05$). However, there was no evidence of an additive effect for anxiety and depression on the prevalence of frequent insufficient sleep.

Discussion

We observed no additive effect of anxiety and depressive disorders on frequent insufficient sleep, but the prevalence of frequent insufficient sleep was highest among those with both disorders. This finding may be partially attributable to the high interrelationship between anxiety and depressive disorders. Our results added to the insights of previous research that found that the presence of both anxiety and depression may be associated with greater morbidity than the presence of either disorder alone (7). Furthermore, the relationship observed between self-report of a provider-diagnosed anxiety disorder and frequent insufficient sleep corroborated prior findings that associated anxiety symptomatology with frequent insufficient sleep (8).

In the setting of primary care, detection of anxiety disorders is problematic. In one study, investigators reviewed the charts of 840 patients at seven primary care clinics who had been administered the Mini International Neuropsychiatric Interview (MINI) in the waiting room. Accordingly, between 71.0% and 97.8% of the patients for whom the MINI suggested the presence of an anxiety disorder had not been previously diagnosed in the clinic setting (9). The investigators concluded that "there is an obvious need to enhance diagnostic screening" in primary care (9). Our findings suggest that just as sleep disturbance has been associated with major depression (1), frequent insufficient sleep is associated with self-report of a diagnosis of an anxiety disorder by a health care provider. Efforts to improve the detection of anxiety disorders in the primary care setting may be enhanced by increased awareness of their apparent association with frequent insufficient sleep.

Our investigation was subject to a number of limitations. First, our data on sleep and diagnosis of an anxiety or depressive disorder by a health care provider were obtained by self-report and were not corroborated by actigraphy, polysomnography, or medical records. Our results were also cross-sectional, thereby prohibiting any inference of causality; previous research, however, has suggested that chronic insomnia is a risk factor for the development of anxiety disorders (10). These data also did not permit assessment of the dates of diagnoses, thereby prohibiting the assumption that they were concurrent. Further, the generalizability of our findings to the overall U.S. population may have been limited because data were collected in only 20 states, and potential respondents without landline telephones were excluded. Finally, possible selection bias related to low response rates and missing data may also have affected our results.

Conclusions

In this study, respondents with a self-reported diagnosis of an anxiety or a depressive disorder were significantly more likely than respondents without one of these disorders to report frequent insufficient sleep. Given that sleep disturbance is a facet of the diagnosis of depression, this result was not surprising. However, our findings indicated that anxiety disorder diagnosis was also associated with frequent insufficient sleep, thereby suggesting that clinicians detecting the presence of an anxiety disorder would be well advised to inquire about sleep sufficiency. Moreover, individuals reporting diagnosis of both disorders were at greatest risk of frequent insufficient sleep. Thus patients with co-occurring anxiety and depression may especially benefit from health care monitoring of sleep sufficiency and, potentially, therapeutic intervention.

Acknowledgments and disclosures

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

The authors report no competing interests.

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