

Sleep Disturbances and Suicide Risk



Rebecca A. Bernert, PhD^{a,*}, Michael R. Nadorff, PhD^b

KEYWORDS

• Suicide • Psychiatric illness • Nightmares • Sleep disorders • Sleep interventions

KEY POINTS

- Suicide is a preventable public health problem that occurs in the context of psychiatric illness.
- Accounting for the presence and severity of psychopathology as a confounding variable is essential to clarifying whether disturbed sleep presents independent risk for suicidal behaviors.
- Preliminary research suggests that subjective sleep disturbances may serve as a stand-alone risk factor for suicidal ideation, attempts, and death by suicide.
- Sleep interventions appear to predict improvements in depression, and possibly suicidal ideation specifically.
- Additional research is needed to delineate poor sleep as a suicide risk factor and intervention tool for suicidal behaviors.

Suicide constitutes a global disease burden, accounting for over 1 million deaths annually. In the United States, suicide is responsible for over 30,000 fatalities every year, with an estimated 25 attempts occurring for every death by suicide.^{1,2} Suicide is a complex, but preventable public health problem, with far-reaching personal and social consequences. Improvements in the identification of risk factors for suicide ultimately enhance the ability to intervene and prevent death by suicide.

Past research has identified biological, psychological, and social factors that confer elevated risk for suicide. Evidence suggests that disturbances in sleep are one such risk factor, predicting increased risk for suicidal behaviors. Both sleep disorders and general sleep complaints are linked to greater levels of suicidal ideation and depression, as well as both attempted and completed suicide.^{3–6} Sleep problems are listed among the top 10 warning signs of suicide from the Substance Abuse and Mental Health Services Administration,⁷ and preliminary evidence suggests that

improvements in sleep may therapeutically impact depression and suicide risk.^{8,9}

A REVIEW OF THE LITERATURE: IMPORTANT METHODOLOGICAL CONSIDERATIONS

Numerous investigations have evaluated sleep disturbances, such as insomnia symptoms, poor sleep quality, and nightmares, in relation to suicidal behaviors. Two methodological issues should be considered in reviewing this literature. The first issue involves the quality of methods, instruments, and measures used to assess sleep disturbance and suicidal symptoms. Early studies in this area often evaluated the relationship using only a single item to assess both sleep disturbance and suicidal symptoms, in many cases, drawn retrospectively from a brief depression inventory; yet rigorous, state-of-the-art assessment techniques exist for sleep difficulties (ie, objective sleep measures and validated symptom inventories) and suicide risk (ie, empirically based clinician-administered

^a Department of Psychiatry and Behavioral Sciences, Stanford University School of Medicine, 401 Quarry Road, Stanford, CA 94304-5797, USA; ^b Department of Psychology, Mississippi State University, PO Box 6161, Mississippi State, MS 39762, USA

* Corresponding author.

E-mail address: rbernert@stanford.edu

scales and multidimensional symptom severity instruments). The second issue involves the tendency not to adjust for the presence of psychopathology. The presence and severity of psychopathology are important potential confounders in this relationship. Suicide occurs in the presence of psychiatric illness, and over 90% of suicide decedents will have a mental disorder at the time of death.¹⁰ In addition, both sleep disturbances and suicidal symptoms are diagnostic features of major depression.¹¹ Prospective investigations that utilize validated symptom measures and adjust for existing psychopathology best clarify whether poor sleep is an independent risk factor for suicide outcomes, or a mere correlate of greater psychopathology. In this article, articles have been selected and reviewed with these criteria in mind. It is organized by reports examining subjectively measured versus objectively measured sleep disturbance, and reviewed according to the type of suicidal risk evaluated (suicide ideation, suicide attempts, and suicide death).

INSOMNIA SYMPTOMS, NIGHTMARES, AND SLEEP BREATHING DISTURBANCES

Risk for Suicidal Ideation

Several investigations have examined the relationship between sleep disturbances and risk for suicidal ideation. Cukrowicz and colleagues¹² examined nightmare symptoms and suicidal ideation among a nonclinical sample of 220 undergraduate students. Insomnia and nightmare symptoms were associated with suicidal ideation, but after controlling for depression severity, only nightmares were independently associated with elevated suicidal ideation. Bernert and colleagues¹³ examined self-reported sleep complaints and suicidality in a cross-sectional study of 176 psychiatric outpatients. After controlling for the influence of depression severity and other demographic factors, the association between nightmares and suicidal ideation remained significant, whereas the link between other sleep complaints (ie, insomnia and sleep-disordered breathing symptoms) and suicidality did not. Nadorff and colleagues¹⁴ built upon this finding by evaluating insomnia and nightmares using the same self-reported symptom inventories among a nonclinical sample of 583 undergraduate students. Results again revealed that only nightmares were associated with suicidal ideation independent of symptoms of depression, anxiety, and post-traumatic stress disorder (PTSD). These findings converge somewhat with adolescent investigations. A study by Roberts and colleagues showed that, unlike the previously mentioned reports, insomnia was a significant predictor of

elevated suicidal ideation with depression as a covariate.¹⁵ A large (N = 1362) school-based survey study in China revealed that only nightmares were significantly associated with suicidal ideation after controlling for depressive symptoms.¹⁶ Taken together, these data suggest convergence with regard to nightmares as a unique predictor of suicidal ideation. The link between insomnia and suicidal ideation remains inconsistent.

Only 1 investigation has evaluated potential sleep breathing disorders in this relationship. Krakow and colleagues³ examined subjective sleep disturbances in 153 female sexual assault survivors with PTSD. Each woman completed various questionnaires of sleep breathing disturbances, depressive symptoms, and suicidal ideation. Participants were originally recruited for a nightmare treatment program, which may have inflated the prevalence of other co-occurring sleep complaints. Nonetheless, results indicated that women who experienced a potential sleep breathing disorder also suffered significantly greater levels of depression and suicidal ideation. Unfortunately, this study did not control for the severity of depression in this relationship to evaluate independent effects of such sleep breathing disturbances on suicide risk.

Risk for Suicide Attempts

Insomnia and nightmare symptoms also appear to serve as risk factors for overt suicidal behavior. Hall, Platt, and Hall¹⁷ retrospectively examined the sleep of 100 consecutive patients who made suicide attempts, finding that 64% self-reported sleep onset, sleep maintenance, and terminal insomnia, and 92% reported having at least one of the three. These rates of insomnia appear disproportionately high compared with those in the general population, suggesting that complaints of insomnia may be more prevalent in those who attempt suicide than in the general public. This study did not, however, adjust for covariates to determine whether greater insomnia symptoms were explained by higher depression severity among those with a suicide attempt history.

Using a similar study design, Sjostrom and colleagues¹⁸ retrospectively evaluated nightmares among those with a past history of suicide attempts. Results revealed that participants with nightmares had significantly higher scores on a measure of suicide risk than those without nightmares. In a subsequent study conducted by the same group, this sample was followed prospectively for 2 years.¹⁹ Results revealed that the presence of persistent nightmares significantly predicted risk for future suicide attempts across the 2-year timeline. Even after accounting for effects of *Diagnostic and Statistical*

Manual of Mental Disorders axis 1 disorders including depression, anxiety, PTSD, and substance abuse, risk for a suicide attempt was approximately 4 times higher among those with persistent nightmares compared with those without.

Risk for Death by Suicide

Insomnia symptoms have also been associated with death by suicide. Fawcett and colleagues conducted one of the first studies to prospectively examine sleep, depression, and suicide.⁴ In a group of depressed patients, symptoms of global insomnia were more severe among those who died by suicide within a 13-month period, suggesting insomnia symptoms may be considered a clinical indicator of acute suicidal risk. Similar findings were demonstrated in a population-based study conducted in Japan. Fujino and colleagues⁵ showed that, among 13,259 middle-aged adults, only sleep maintenance insomnia at baseline, compared with other sleep disturbances (eg, difficulty initiating sleep, nonrestorative sleep), significantly predicted death by suicide 14 years later. Nevertheless, only 2 known studies have adjusted for psychopathology in assessing insomnia disturbance as a risk factor for death by suicide. First, a recent follow-up of the Nord-Trøndelag Health Survey (HUNT) I study²⁰ found that those who endorsed insomnia disturbance nearly every night increased risk of suicide two-fold after controlling for effects of depression, anxiety, and substance abuse. Next, a psychological autopsy study of 140 adolescent suicide victims showed that, compared with 131 matched community controls, adolescent suicide decedents were 7 times more likely to exhibit insomnia symptoms (10 times for any sleep disturbance) in the week prior to death.²¹ In this study, overall sleep disturbances remained a significant risk factor for death by suicide, controlling for the differential rate of affective disorder between decedents and controls, and after accounting for depression severity.

Nightmares have also been linked to death by suicide. In a prospective, population-based study conducted in Finland, Tanskanen and colleagues⁶ revealed an association between nightmare frequency at baseline and completed suicides at follow-up 14 years later. Compared with subjects reporting no nightmares, those reporting occasional nightmares were 57% more likely to die by suicide, and those with frequent nightmares were 105% more likely to die by suicide. Although these findings converge with those reported for insomnia, neither study assessed for the presence of psychiatric disorders or symptoms as covariates.

Summary

In summary, multiple studies indicate that self-reported insomnia symptoms may confer independent risk for suicidal ideation, suicide attempts, and death by suicide^{15,19–21}; whereas several other reports do not.^{12–14} Both cross-sectional and prospective investigations suggest that nightmare symptoms are an independent risk for suicidal ideation and suicide attempts, whereas no study has evaluated the unique association between nightmares and risk for suicide death.

ELECTROENCEPHALOGRAM SLEEP STUDIES Risk for Suicidal Ideation

Few investigations have evaluated suicide risk in association with an objective measurement of sleep. Agargun and Cartwright²² investigated the relationship between rapid eye movement (REM) sleep, dream variables, and suicidality in depression. Compared with nonsuicidal participants, suicidal patients averaged a shorter REM sleep latency, a higher REM percentage, and a more negative dream-like quality of REM. This study did not control for depression severity, and used a single item to assess suicidal ideation. Nevertheless, abnormalities in REM would appear consistent with literature showing associations between suicidal ideation and self-reported nightmares.^{13,14,16}

Risk for Suicide Attempts

Regarding risk for suicide attempts, Sabo and colleagues²³ compared depressed patients with and without a history of suicide attempts in a retrospective analysis of sleep architecture. Electroencephalographic sleep studies revealed that depressed participants with a prior suicide attempt had lower sleep efficiency, longer sleep latency, and fewer late-night delta counts. Only 1 study in this area has assessed the connection between suicidal ideation and sleep complaints beyond that explained by depression. Keshavan and colleagues²⁴ examined REM sleep in psychotic patients with and without a history of suicide attempts or ideation. Patients with a history of suicidal behavior showed more REM activity, and REM sleep parameters were not correlated with depression scores. Also, when depression ratings were covaried out, these differences in sleep remained.

Risk for Death by Suicide

To the authors' knowledge, no study to date has evaluated an objective assessment of disturbed sleep and risk for death by suicide.

Summary

In summary, although the previously described findings appear to converge with those for subjective sleep disturbances, results are nonetheless limited by distinct population differences (eg, psychotic vs nonpsychotic depression), study designs (retrospective or cross-sectional), and inadequate measurement techniques (single-item assessment of suicidal ideation or sleep). Although a relationship is suggested between sleep architecture abnormalities and suicide risk, additional research addressing these methodological gaps and replicating past findings is needed.

TREATMENT IMPLICATIONS AND FUTURE DIRECTIONS

Based on the previously described findings, treatment of sleep disorders to reduce risk for depression and suicide may be a fruitful area of future research. Various reports show that sleep-focused treatments predict meaningful improvements in nonsleep outcomes, including health-related quality of life, depression, and PTSD symptoms.^{24–26} For the treatment of nightmares, both controlled and uncontrolled trials support the efficacy of a behavioral nightmare therapy, Imagery Rehearsal Treatment, to reduce nightmare frequency and severity.^{26–29} For the treatment of insomnia, cognitive behavioral therapy for insomnia (CBTI) is considered a first-line treatment for chronic insomnia by National Institutes of Health consensus; it appears more durable than traditional hypnotics,³⁰ and is associated with significant improvements in depression according to randomized trials.^{8,31,32} Moreover, preliminary research from the authors' group, based on a large uncontrolled trial (N = 303 community outpatients), indicates that CBTI may result in symptom reductions in suicidal ideation.⁹

In conclusion, research provides promising evidence that sleep disturbances may confer independent risk for suicidal behaviors, and 1 preliminary finding suggests that treatment of sleep problems may decrease risk for suicide ideation. Future studies are needed, rigorous in design and methodology, to further delineate poor sleep as an independent suicide risk factor and intervention tool. Both in research and in clinical practice, the authors recommend standard use of empirically supported suicide risk assessment frameworks³³ to routine clinical decision-making and emergency referral procedures in the treatment and management of suicidal behaviors.

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