



Associations between adolescent sleep disturbance and different worry themes: findings from a repeated cross-sectional study from 1988 to 2011



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ABSTRACT

Objective: The objective was to investigate relationships between adolescent sleep disturbance and various worry themes.

Methods: Questionnaire data from 8 cross-sectional collections between 1988 and 2011 were used. The sample included more than 20,000 adolescents aged 15–16. Binary logistic regressions were used for the analyses.

Results: Sleep disturbance and female sex increased the odds of worrying about all themes. Sleep disturbance shared stronger associations with worry about financial security, accidents/illness, being bullied, and terrorist attacks (odds ratios, 2.65–3.35) compared with worry about environmental destruction or nuclear war (odds ratios, 1.73–2.11). No interactions between sleep and year of investigation were found. **Conclusions:** Little is known about the association between adolescent worry and sleep, and about sleep disturbance and specific worry content. This study shows that the strength in the relationship between adolescent worry and sleep varies with worry themes. Knowledge of the worry content related to sleep may aid in targeting preventions and interventions.

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Many adolescents have sleep disturbances, and this is associated with adverse consequences.¹ Adolescent sleep disturbances have many roots: pubertal shifts in circadian rhythms, large variations in school and weekend bedtimes,^{2,3} using electronic media before bedtime, and worrying.^{4,5} Sleep disturbance may both fuel⁶ and be fueled by worry.⁷ Worry is cognitive activity (eg, thoughts, mental images) with negative focus, prompted by impending threats, expected events, or risks, aimed at avoiding potential adverse outcomes.⁸ Normally, worry is an adaptive process,⁹ but when exaggerated to catastrophic proportions, worry may hinder effective coping.^{10–12} Worry and sleep disturbance have both been associated with the development of psychopathology for adults.^{13,14} There are few studies on adolescent worry and sleep disturbance, but the results indicate the same pattern. In one experimental study, worries appeared more threatening when sleep deprived than when well rested.¹⁵ A likely explanation is changes in emotion regulation due to a lack of sleep, which in turn may make people more susceptible to develop psychopathology.¹⁶

In another study, adolescent worry mediated the pathway between sleep disturbance and depression 1 year later.⁷ The relationship between adolescent worry and sleep is complicated, with worry potentially fueling⁶ and being fueled by sleep disturbance.⁷

Although the association between sleep disturbance and worry is thoroughly established,¹⁷ little is known about worry content in relation to sleep. Findings that *worry for sleep* is a stronger predictor of poor sleep for adults than “generic worry” indicate that worry themes matter.¹⁷ Measures of generic worry in the sleep literature have focused on worry frequency, trait worry, and the perceived impact of worry on life rather than on content. Therefore, it is possible that various worry themes differ in their association with sleep disturbance. As the literature on childhood worry shows that worry content changes with age, research on adolescent worry in relation to sleep is warranted. The aim of this study was to investigate the relationships between adolescent sleep disturbance and various worry themes.

Participants and methods

Data are from 8 repeated cross-sectional data collections from the Young in Värmland study, 1988–2011. All 15- to 16-year-olds, 20,115

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Fig. 1. Proportions of adolescents reporting worry among those reporting disturbed sleep or sleeping well, respectively, from 1988 through 2011.

adolescents, 50% girls, in the County of Värmland were asked to complete anonymous questionnaires in the classroom about living conditions and health. The ethical application was reviewed by the local ethics committee at Karlstad University, and ethical research standards were followed. Adolescents were informed about the study and that participation was voluntary. Response rates were as follows: 90%, 1988 (n = 2701); 89.1%, 1991 (n = 2605); 93.7%, 1995 (n = 2426); 91%, 1998 (n = 2342); 88.2%, 2002 (n = 2478); 85.7%, 2005 (n = 2664); 84.6%, 2008 (n = 2653); and 83.3%, 2011 (n = 2246). Demographics were examined for the entire study sample from 1995 to 2011. There were 7333 (49.5%) girls and 7426 (50.5%) boys. Forty-eight percent of girls and 32% of boys reported worry about any theme. Sleep disturbance was reported by 24% of girls and 16% of boys.

Sleep disturbance was measured with 1 item from the Psychosomatic Problems scale¹⁸: “During the past school-year, have you had difficulty sleeping?” Responses on a 5-point Likert scale were as follows: 1 = “never,” 2 = “rarely,” 3 = “sometimes,” 4 = “often,” and

5 = “always.” Most people occasionally have trouble sleeping; therefore, responses “never” through “sometimes” were considered *sleeping well*, and responses “often” or “always” were considered *sleep disturbance*. In the text, *sleep status* refers to frequency of sleep disturbances.

Worry was measured with 10 items in the question¹⁹ “Have you felt worried about any of the following lately?”: family economy, parent becoming unemployed, own accident, own serious illness, family member in an accident, family member becoming seriously ill, being bullied or beaten up, nuclear war, environmental destruction, and terrorist attacks in Sweden (Data on worry for terrorist attacks were available from 2011 only). Each response was scored on a 5-point Likert scale: 1 = “never,” 2 = “rarely,” 3 = “sometimes,” 4 = “often,” and 5 = “always.” Most people worry occasionally²⁰; therefore, responses “never” through “sometimes” were considered *not worried*, and responses “often” or “always” were considered *worried*. Some worry items were combined based on similarity: family financial security (financial, 2 items), and personal and family health

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