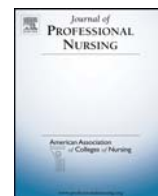




Contents lists available at ScienceDirect

## Journal of Professional Nursing



## Relationships among sleep quality, coping styles, and depressive symptoms among college nursing students: A multiple mediator model

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### ARTICLE INFO

#### Article history:

Received 26 April 2017

Revised 4 December 2017

Accepted 11 December 2017

Available online xxx

#### Keywords:

Sleep quality

Coping

Emotion disengagement

Depression

Mental disorders

### ABSTRACT

**Background:** Poor sleep quality and depressive symptoms are common among college nursing students, and may be associated with each other. However, the mechanism for this association has not been well understood.

**Purpose:** The study is to examine the potential mediating role of coping styles in the association between sleep quality and depressive symptoms among college nursing students.

**Methods:** 242 undergraduate nursing students at a public university in the northeast United States completed an online survey delivered through SurveyMonkey® with self-reports of sleep quality, coping styles, and depressive symptoms from October to November 2015.

**Results:** Multivariate linear regression models suggested that poor sleep quality was significantly associated with depressive symptoms ( $\beta = 1.00, p < 0.01$ ) in nursing students. The four coping styles (problem engagement, emotion engagement, problem disengagement, and emotion disengagement) together reduced the strength of the association between sleep quality and depressive symptoms by 41%. Specifically, emotion disengagement coping plays an important mediating role in this association.

**Conclusions:** In addition to sleep promotion, effective interventions to facilitate the development of appropriate coping strategies among nursing students are needed to enhance their mental health and well-being.

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### Introduction

Mental disorders have been identified as the leading cause of disability in the U.S. (Murray, Atkinson, Bhalla, et al., 2013). Depression, one of the most common mental disorders, has been estimated to increase and become the second leading cause of disability by the year 2020 (Murray & Lopez, 1996). According to the Association for University and College Counseling Center Directors Survey, depression is the second leading concern among college students following anxiety (Mistler, Reetz, Krylowicz, & Barr, 2015). Around 10–25% of college students are depressed, and many of those individuals experience their first bout of depression while in college (Zawadzki, Graham, & Gerin, 2013). Depression generates concerns among college students because it can lead to a variety of potentially dangerous consequences such as self-injurious behaviors, non-suicidal self-injury, suicidal behaviors, and suicide (Baetens, Claes, Muehlenkamp, Grietens, & Onghena, 2011; Bebbington et al., 2010; Klonsky, 2011; Zawadzki et al., 2013).

Depression is disproportionately prevalent in women than in men, with evidence supporting that female college students are two times more likely to experience depression than male college students (National Alliance on Mental Illness, 2012). The American College

Health Association Survey ( $n = 23,863$ ) reported that 45% of female students and 36% of male students felt so depressed that it was difficult to function (American College Health Association, 2007). Depression is more of a concern for nursing students who are primarily female. Recognizing depressive symptoms and identifying potential risk factors and mechanisms are important to promote mental health and well-being of nursing students.

### Review of the literature

Regarding depression, one possible related phenomenon is that college students do not sleep enough, and often experience disturbances in their sleep. In a recent study, 75% of college students surveyed experienced sleep problems such as delayed sleep phase syndrome, difficulty falling asleep, sleep disturbances, and excessive daytime sleepiness (Altun, Cinar, & Dede, 2012), while another study reported that as few as 11% of college students meet the criteria for good sleep quality (Zawadzki et al., 2013). Female college students have been shown to have longer sleep latency, more awakenings, and poorer sleep quality than male college students (Tsai & Li, 2004).

A complex and bidirectional relationship may exist between sleep and depression. Previous studies have reported that sleep disturbances contributed to depressive symptoms in college students (Moo-Estrella, Perez-Benitez, Solis-Rodriguez, & Arankowsky-Sandoval, 2005).

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Changes in sleeping patterns are part of the criteria for diagnosing depression and multiple studies have shown through polysomnographic techniques that depressed individuals have an increased sleep latency and sleep disturbance (Walker & van der Helm, 2009). Nyer and colleagues reported that college students who experienced depressive symptoms in combination with sleep disturbances would experience a greater burden of comorbidities and a greater loss of physical and cognitive functions than those same students without sleep disturbances (Nyer, Farabaugh, Fehling, et al., 2013). Sleep disturbances, including reduced sleep, have been shown to intensify the risk of depressive symptoms in female college students (Regestein et al., 2010).

Nursing students deserve particular attention regarding their sleep and mental health, as nursing students are primarily female and encounter some unique stressors from other college students, such as irregular work hours from clinical practicum, which may increase their susceptibility to poor sleep and depressive symptoms. Kaur and colleagues reported that 43.5% of nursing students experienced excessive daytime sleepiness due to excessive workload, unregulated work hours, and inadequate sleep hygiene (Kaur, Ghai, Grover, & Singh, 2015). Depressive symptoms among nursing students from different countries have been linked to academic stress, inadequate coping, lack of emotional support and self-esteem, insecurity about occupational future, low perceptions of clinical practice, and poor balancing of school, work, and personal life (Cha & Sok, 2014; Chatterjee et al., 2014; Chernomas & Shapiro, 2013; Ross et al., 2005; Xu et al., 2014).

Coping, defined as “the cognitive and behavioral efforts to manage specific external and/or internal demands” (Rappaport & Seidman, 2000), may vary by individual student. Broadly, coping strategies may include engaged-coping (direct attempts to influence either the stressor or response to the stressor) and disengaged-coping (efforts to distance oneself emotionally, cognitively, and physically from the stressor), or emotional-coping (reducing the negative emotional responses associated with stress) and problem-coping (reducing the stress by tackling the problem or stressful situation that causes stress) (Rappaport & Seidman, 2000). Brougham and colleagues reported that emotion-focused coping strategies dominated over problem-solving strategies among college students, and female students reported a greater use of emotion-focused coping strategies than male students (Brougham, Zail, Mendoza, & Miller, 2009). Another study reported that maladaptive coping was the main predictor of depression in young college students (Mahmoud, Staten, Hall, & Lennie, 2012). Sadeh, Keinan, and Daon discovered that impaired sleep was linked to impaired coping styles in response to stress (Sadeh, Keinan, & Daon, 2004).

Although the association between sleep and depression has been observed, the exact mechanism for this association has not been well understood, especially in nursing students who are predominantly female. Researchers have rarely examined the extent to which the link between sleep quality and depressive symptoms may be influenced by coping styles.

## Aims

The objectives of this study are (1) to explore the association between sleep quality and depressive symptoms; and (2) to examine the potential mediating role of coping styles in the association between sleep quality and depressive symptoms among college nursing students. The conceptual model in Fig. 1 guides the study design and analyses.

## Methods

### Study design

This study used a quantitative, cross-sectional design to explore the role of coping styles in the association between sleep quality and depressive symptoms among college nursing students.

### Participants

This study collected an online survey from a sample of 242 undergraduate nursing students at a public university in the northeast U.S. A non-probability convenience sampling method was used to recruit study participants. All nursing students over 18 years old and enrolled in the Baccalaureate Nursing Program at the public university in fall 2015 (total number = 399) were eligible to participate.

### Measures

#### Dependent variables

**Depressive symptoms.** Depressive symptoms were assessed with the Center for Epidemiologic Studies Depression Scale (CES-D), the 10-item version. This scale is used to identify current depression symptomatology in individuals age 18 and older during the past week (Radloff, 1991). Each item is rated on a 4-point Likert scale (0 = rarely or none of the time; 1 = some or a little of the time; 2 = occasionally or a moderate amount of the time; and 4 = most or all of the time) with a range in total score from 0 to 30, and higher scores indicating greater severity of depression symptomatology. A total score of 10 or more is indicative of depression. This scale demonstrates good reliability with the study sample (Cronbach's alpha = 0.88).

#### Independent variables

**Sleep quality.** Sleep quality was assessed with the Pittsburg Sleep Quality Index (PSQI), a 19-item scale that assesses seven components of sleep quality during the past month, including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction (Buysse,

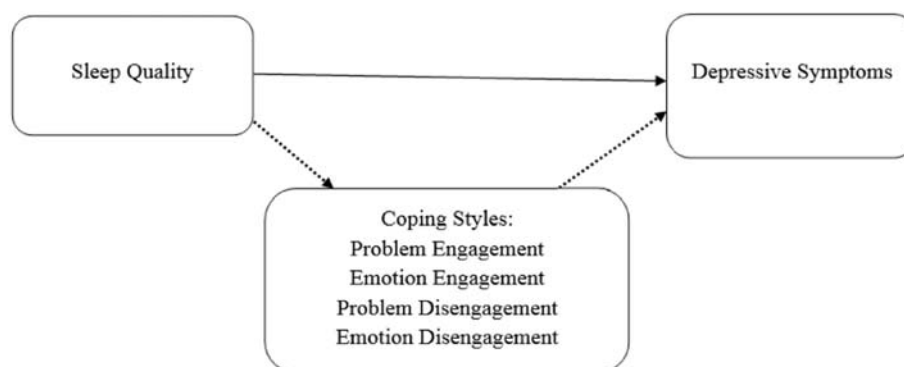


Fig. 1. A conceptual model for the relationships among sleep quality, coping styles, and depressive symptoms.

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