Associations between sleep disturbances, personality, and trait emotional intelligence☆

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ABSTRACT

Insomnia, difficulty falling asleep, staying asleep, or waking earlier than desired, is often associated with complaints of nonrestorative sleep, but these complaints can occur independently. Fragmented sleep and nonrestorative sleep relate to one's mood, ability to process their own or others' emotions, and can lead to changes in cognitions and behaviors. Personality traits related to increases in anxiousness may play a role in the development and maintenance of sleep disorders and associated daytime impairment of nonrestorative sleep. Relations between sleep disturbance, personality traits, and trait emotional intelligence are underrepresented and findings are mixed. This study addressed inconsistencies by identifying associations between the Big Five personality traits, trait emotional intelligence, complaints of nonrestorative sleep, and disrupted sleep associated with insomnia using a sample of university students. We predicted that neuroticism would relate to poorer sleep, and that conscientiousness and trait emotional intelligence would be associated with better sleep. Openness to experience, extraversion, and agreeableness are rarely discussed in the literature, but were expected to associate similarly to conscientiousness. Results provided support that trait characteristics are associated with insomnia severity and restorative sleep quality.

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1. Introduction

Insomnia disorder is a prevalent sleep disorder, occurring in almost 16% of the population, characterized by: a continuously occurring complaint of difficulty initiating sleep, maintaining sleep, or early morning awakening with the inability to return to sleep; related daytime impairment; and concerns or dissatisfaction with sleep (American Academy of Sleep Medicine, 2014; American Psychiatric Association, 2013; Lichstein, Durrence, Riedel, Taylor, & Bush, 2004). Nonrestorative sleep (NRS), a complaint of poor sleep quality that does not leave an individual rested upon awakening despite adequate duration, is often associated with a diagnosis of insomnia disorder (American Psychiatric Association, 2013). However, complaints of NRS have also been identified without other symptoms of insomnia, occurring with normal sleep initiation, maintenance, and duration (Ohayon, 2005; Ohayon & Roth, 2001; Roth et al., 2006, 2010). The role of NRS in diagnosing insomnia has varied over the history of diagnostic systems. At present, it remains a component of insomnia disorder within the DSM-5 but was removed in the development of the ICSD-3 (American Academy of Sleep Medicine, 2014; American Psychiatric Association, 2013). This discrepancy signifies the importance of research aiming to identify factors specific to insomnia and complaints of NRS.

Personality traits are one factor of interest. Literature related to associations between personality differences and sleep disruption is limited and studies use varied measures, different specificity of variables (e.g. nonrestorative sleep, sleep quality), and study methods (Harvey, Gehrman, & Espie, 2014; van de Laar, Verbeek, Pevernagie, Aldenkamp, & Overeem, 2010; Williams & Moroz, 2009). However, there seems to be a general trend that those with sleep disturbances or poor sleep quality display more traits of neuroticism, internalization, anxiety, and traits associated with perfectionism (Harvey et al., 2014; Ohayon, 2005; van de Laar et al., 2010; Williams & Moroz, 2009). Individuals high in traits related to neuroticism may be particularly vulnerable to stress-related sleep disruption which could play a causal role in the development of insomnia (Harvey et al., 2014; van de Laar et al., 2010; Williams & Moroz, 2009). These individuals take longer to fall asleep, sleep less deeply, have poorer sleep quality, shorter sleep overall, and have lower rapid eye movement (REM) density compared to those low in these traits (Harvey et al., 2014; Williams & Moroz, 2009).

Traits of conscientiousness also seem to be associated with sleep disturbance. Conscientiousness is positively related to sleep quality and appears to moderate the extent to which high-neuroticism individuals are vulnerable to the adverse effects of poor sleep, with high-neuroticism/low-conscientiousness individuals experiencing more distress and

dysfunction to perceived sleep loss and more worrying and rumination around sleep onset (Harvey et al., 2014; Williams & Moroz, 2009). Conscientiousness was positively related with better health behaviors overall, possibly indicating that conscientious individuals have healthier sleep related behaviors and therefore less disturbance and complaints about poor sleep quality (Bogg & Roberts, 2004). Though research identifying possible connections between NRS and personality traits is scarce, research indicates that personality differences exist for those who are formally diagnosed with insomnia and those who subjectively identify as insomniacs. Those classified as "objective insomniacs" displayed high introversion, whereas "subjective insomniacs" showed high neuroticism (Dorsey & Bootzin, 1997). These findings may extend to NRS, a subjectively identified sleep problem.

Another factor of interest is trait emotional intelligence (TEI). Emotional intelligence, described as the perception of one's ability to identify and regulate one's emotional state, involving abilities such as self-awareness, managing emotions, motivating one-self, empathy, and handling relationships, has been conceptualized into two groups: ability emotional intelligence and TEI. The former relates to concrete abilities, the latter is defined as a group of emotional perceptions, assessed through questionnaires and rating scales, and includes behavioral dispositions and self-perceived abilities (Goleman, 1995; Petrides & Furnham, 2001; Petrides, Pita, & Kokkinaki, 2007; Salovey & Mayer, 1990). Evidence shows that TEI is linked to many psychological and behavioral facets, including personality, goal orientation, life satisfaction, affect intensity, alexithymia, and depression (Dawda & Hart, 2000; Martinez-Pons, 1997; Petrides & Furnham, 2001). Higher emotional intelligence has been associated with better mental, psychosomatic, and physical health outcomes, with TEI being more strongly associated with mental health than was emotional intelligence ability (Schutte, Malouff, Thorsteinsson, Bhullar, & Rooke, 2007).

Sleep and emotions are closely linked and their relationship is bidirectional (Kahn, Sheppes, & Sadeh, 2013). Sleep loss produces temporary changes in cerebral metabolism, cognition, emotion, and behavior consistent with mild prefrontal lobe dysfunction including problems with motivation, empathy, flexibility, planning and organization, behavioral inhibition, emotional blunting and affective dysregulation, and insight (Barrash, Tranel, & Anderson, 2000; Killgore et al., 2008, Spinella, 2005). Aspects of emotional self-assessment may be adversely affected by sleep deprivation (Killgore et al., 2008). This relationship may extend to additional sleep problems including insomnia and NRS or may constitute a predisposition to sleep difficulties. Sleep loss is related to increases in negative affect and less intense, less frequent positive emotions. A negative emotional state prior to bed may alter one's sleep quality with increases of sleep onset latency, wakefulness after sleep onset, number of awakenings from REM sleep, decreases in total sleep time, sleep efficiency, REM and slow-wave sleep stages (Kahn et al., 2013). Sleep complaints may be more frequent in individuals with low TEI due to an inability to adequately differentiate between symptoms of poor sleep.

Research identifying characteristics of sleep disturbances and the emotional associations of sleep loss is needed and continues to be understudied (Kahn et al., 2013; Ohayon, 2005; Roth et al., 2010; Vernon, Dugar, Revicki, Treglia, & Buysse, 2010; Wilkinson & Shapiro, 2012). Though sleep deprivation has been found to be associated with decreased global emotional intelligence, intra- and interpersonal functioning, stress management, and behavioral coping, the comparison between sleep problems and TEI has not been researched (Killgore et al., 2008). Until recently, a standardized operational definition of NRS had been lacking, with sleep quality often assessed using a single item (Stone, Taylor, McCrae, Kalsekar, & Lichstein, 2008; Vernon et al., 2010; Wilkinson & Shapiro, 2012). Drake et al. (2014) developed the patient-reported Restorative Sleep Questionnaire (RSQ) as a reliable and valid measure of NRS complaints permitting research to be conducted with the goal of providing a better understanding of NRS. Finally, there is insufficient data related to the associations between sleep and

the other Big Five personality traits (extraversion, agreeableness, openness to experience).

The current study addressed some of these gaps by investigating the associations between the Big Five personality traits, TEI, sleep difficulties associated with insomnia, and NRS quality. It was predicted that the Big Five personality traits and TEI would be associated with sleep problems and complaints of NRS. Specifically predicting that neuroticism would relate to poorer sleep (indicated by greater insomnia severity and worse restorative sleep quality) and that conscientiousness and TEI would be associated with better sleep (indicated by less insomnia severity and better restorative sleep quality). Outcomes may help to address inconsistencies in the literature leading to a better understanding of characteristics related to sleep disruptions in insomnia and complaints of NRS. Such information could aid in improved understanding of the associations that one's perceptions of sleep, emotion regulation, and disruptions have on sleep complaints and quality of life.

2. Methods

2.1. Participants

Undergraduate students ($n = 553$) were recruited from introductory psychology courses at a local university and received course credit for participating in this research study. Participants were 23.3% male ($n = 129$) and 76.7% female ($n = 424$). The participants' average age was 18.8 ($SD = 1.7$). The sample was primarily Caucasian, with 84.45% ($n = 467$) Caucasian, 7.41% ($n = 41$) African American, 2.89% ($n = 16$) Hispanic/Latino, 2.53% ($n = 14$) Asian, 2.53% ($n = 14$) identifying as mixed/other, and 0.18% missing response ($n = 1$). There were no eligibility screening criteria.

2.2. Measures

2.2.1. Demographics

Participants completed an investigator-designed health survey to obtain demographic information such as age, gender, and race. The form also included questions regarding the use of prescription or over-the-counter sleep medication.

2.2.2. Insomnia severity

Perceptions of insomnia severity were assessed with the Insomnia Severity Index (ISI; Morin, 1993). The ISI is a seven-item self-report questionnaire which measures the severity of one's insomnia problems covering the past two weeks. The measure was scored by adding the responses of all seven items. A score of 0–7 indicates "no clinically significant insomnia"; 8–14 indicates "subthreshold insomnia"; 15–21 indicates "clinical insomnia (moderate severity)"; and 22–28 indicated "clinical insomnia (severe)" (Morin, 1993). The ISI is a valid and reliable self-report measure used to evaluate and quantify perceived sleep disturbance associated with insomnia ($\alpha = 0.74$) with empirical support for the online use of the index to measure self-reported insomnia severity (Thorndike et al., 2011). Content validity was supported by a component analysis to capture diagnostic criteria for insomnia (Bastien, Vallières, & Morin, 2001).

2.2.3. Nonrestorative sleep

An online Restorative Sleep Questionnaire (RSQ) was used to assess the restorative quality of one's sleep (Drake et al., 2014). The weekly version of the form used (RSQ-W) includes wake time, time completed, and 9 items assessing characteristics of NRS. The RSQ-W total score is calculated as the average of the questionnaire items. Scores range from 0 to 100, with higher scores indicating better restorative sleep. Participants were instructed to complete the RSQ-W referencing the past 14 days, chosen for uniformity with the other measures used. The RSQ shows good psychometric properties ($\alpha > 0.90$, $r_{test-retest} > 0.80$) and unidimensionality. The RSQ is able to distinguish between healthy